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(Registration No.349, 12th May, 1972, Panji, Goa)



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Journal of Indian Academy of Forensic Medicine (JIAFM)

The official publication of Indian Academy of Forensic Medicine

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Printed and published by Dr. Mukesh Yadav, Editor, JIAFM and Dr. A. D. Aggarwal, Joint Editor, JIAFM on behalf of Indian Academy of Forensic Medicine at name of the press [SHIVANI PRINTERS, NOIDA, [U.P.]

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From Editor's Desk

JIAFM A Quarterly Publication Volume 34, Number 3, July- September, 2012

I feel immense pleasure to present before you the third issue of 2012. I would like to inform all of you that our esteemed Journal of Indian Academy of Forensic Medicine which is published quarterly since 1991 has been started gaining wide recognition not only in India but globally among the scientific community. I am trying to maintain your faith and trust in me to bring this journal to highest level of its achievements.

I have received many requests from other countries about inclusion of many papers in their indexing data base, including USA Government agencies. JIAFM is indexed not only in **IndMed** and **MedInd Indian indexing** agencies but also in the **SCOPUS**, **IMSEAR** informed by the **Information Management and Dissemination (IMD)**, World Health Organization, Regional Office for South-East Asia, Indraprastha Estate, New Delhi, India. It is hoped that once this journal indexed in IMSEAR it would be automatically indexed in the *Global Index Medicus* managed by WHO Headquarters in Geneva as informed.

The title mentioned above has been evaluated for inclusion in **SCOPUS by the Content Selection & Advisory Board (CSAB).** The review of this title is now complete and the CSAB has advised that the title will be **accepted** for inclusion in Scopus. For your information, the reviewer comments are copied below:

This is a well produced journal in an important subject field with interesting content, which deserves a wide readership. The editors are to be commended on their efforts.

I assure you about the quality of research papers and quality of printing in future issues. Your valuable suggestions are always encouraging me and I heartily welcome for future suggestions.

Professor [Dr.] Mukesh Yadav Editor, JIAFM

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Editorial Scope and Consequence of Negligence in Medico-legal Work Recent Views of Supreme Court

Introduction:

With the passage of time, the law also developed and the dictum of the Court emphasized that in a criminal case, the fate of proceedings cannot always be left entirely in the hands of the parties. Crime is a public wrong, in breach and violation of public rights and duties, which affects the community as a whole and is harmful to the society in general.

If, there is clear callousness and irresponsibility on their part and deliberate attempt to misdirect the investigation to favour the alleged accused involved in medico-legal work. This results in shifting of avoidable burden and exercise of higher degree of caution and care on the courts. **Dereliction of duty or carelessness is an abuse of discretion under a definite law and misconduct is a violation of indefinite law.** Misconduct is a **forbidden act** whereas dereliction of duty is the **forbidden quality of an act and is necessarily indefinite.** One is a transgression of some established and definite rule of action, with least element of discretion, while the other is primarily an abuse of discretion. In a recent judgment of the Hon'ble SC these aspects were discussed in detail in larger public interest.

Brief Facts of the Case:

That the fields of Gurumukh Singh and Dayal Singh were adjoining in the village Salwati within the limits of Police Station Sittarganj, District Udham Singh Nagar. These fields were separated by a mend (boundary mound). On **8th December**, **1985**, **Gurumukh Singh**, along with his **father Pyara Singh**, had gone to their fields. At about 12 noon, **Smt. Balwant Kaur**, **wife of Pyara Singh** came to the fields to give meals to Pyara Singh and their son Gurumukh Singh. At about 12.45 p.m., the accused persons, namely, Dayal Singh, Budh Singh & Resham Singh (both sons of Dayal Singh) and Pahalwan Singh came to the fields wielding lathis and started hurling abuses. They asked Pyara Singh and Gurumukh Singh as to why they were placing earth on their **mend**, **upon which they answered that mend was a joint property belonging to both the parties.** Without any provocation, all the accused persons started attacking Pyara Singh with lathis. Gurumukh Singh, at that time, was at a little distance from his father and Smt. Balwant Kaur, was nearby. On seeing the occurrence, they raised an alarm and went to rescue Pyara Singh. The accused, however, inflicted lathi injuries on both.

In the meanwhile, **Satnam Singh**, who was ploughing his fields, which were quite close to the fields of the parties and **Uttam Singh** who was coming to his village from another village, saw the occurrence. These two persons even challenged the accused persons upon which the accused persons ran away from the place of occurrence. Pyara Singh, who had been attacked by all the accused persons with lathis fell down and succumbed to his injuries on the spot. Few villagers also came to the spot.

According to the prosecution, pagri of one of the accused, Budh Singh, had fallen on the spot which was subsequently taken into custody by the Police. Gurumukh Singh, left the dead body of his deceased father in the custody of the villagers and went to the police station where he got the report, scribed by Kashmir Singh in relation to the occurrence.

Injury Report of other 'eye witnesses':

The report was lodged at about 2.15 p.m. on 8th December, 1985 by Gurumukh Singh in presence of **SI Kartar Singh.** FIR was registered and the investigating machinery was put into motion. The **two injured witnesses were examined** by the **Medical Officer at the Public Health Centre, Sittarganj on the date of occurrence.**

Injury Report:

At 4.00 p.m., the doctor examined Gurmukh Singh and noticed the following injuries on the person of the injured witness vide Injury Report.

- Lacerated wound of 5 cm X 1 cm and 1 cm in depth. Margins were lacerated. Red fresh blood was present over wound. Wound was caused by hard and blunt object. Wound was at the junction of left parietal and occipital bone 7 cm from upper part of left ear caused by blunt object. Advised X- ray: Skull A.P. and lateral and the injury(ed) was kept under observation.
- 2. Contusion of 6 cm X 2.5 cm on left side of body 3 cm above the left iliac crest. Simple in nature caused by hard and blunt object.

On 8.12.1985 at 7.30 p.m. doctor examined the injuries of **Smt.Balwant Kaur** and found the following injuries on her person vide **injury report**:

1. Contusion 6 cm X 3 cm on left shoulder caused by hard and blunt object.

- 2. Contusion of 5 cm X 2 cm on lateral side of middle of left upper arm. Bluish red in colour caused by hard and blunt object.
- 3. Contusion of 4 cm X 2 cm on left parietal bone 6 cm from left ear caused by hard and blunt object.

Opinion: According to Medical Officer, these injuries were caused by hard and blunt object and the duration was within 12 hours and the nature of the injuries was simple. Injuries of both these injured persons could have been received on 8.12.1985 at 12.45 p.m. by lathi."

Conflict between Inquest Report / Injury Report and PM Report:

Thereafter, SI Kartar Singh proceeded to the place of occurrence in village Salwati. He found the dead body of Pyara Singh lying in the fields. In the presence of panchas, including Balwant Singh, he **noticed that there were three injuries on the person of the deceased, Pyara Singh and prepared Inquest Report** recording his opinion that the deceased died on account of the injuries found on his body. After preparing the **site plan**, he also wrote a letter to the Superintendent, Civil Hospital, Haldwani for post mortem.

Postmortem Examination:

The dead body was taken to the Civil Hospital, Haldwani by Constable Chandrapal Singh. Medical Officer on duty performed the post mortem upon the body of the deceased and **did not find any ante-mortem or post-mortem injuries on the dead body. On internal examination, he did not find any injuries and could not ascertain the cause of death.**

Further, he preserved the viscera and gave the post-mortem report. The doctor in his report recorded as under:

"Viscera in sealed jars handed over to the accompanying Constables.

- Jar No.1: sample preservative saline water.
- Jar No.2: Pieces of stomach
- Jar No.3: Pieces of liver, spleen and kidney.

Opinion: Death occurred about one day back. Cause of death could not be ascertained. Hence, viscera preserved."

SC observed that "It appears from the record that the deceased's viscera, which allegedly was handed over by doctor to the police, was either never sent to the Forensic Science Laboratory (FSL) for chemical examination, or if sent, the report thereof was neither called for nor proved before the Court. In fact, this has been left to the imagination of the Court".

Duty to Acts in Accordance with the Police Manual:

The Investigating Officer has also failed in performing his duty in accordance with law.

- **Firstly**, for not recording the reasons given by medical officer for non-mentioning of injuries on the post mortem report, which had appeared satisfactory to him.
- Secondly, for not sending to the FSL the viscera and other samples collected from the body of the deceased by medical officer, who allegedly handed over the same to the police, and their disappearance.

There is clear callousness and irresponsibility on their part and deliberate attempt to misdirect the investigation to favour the accused.

Consequences of Dereliction of Duty in Investigation of Crime:

Supreme Court stated in the case of State of Punjab & Ors. vs. Ram Singh Ex. Constable (1992) that the ambit of these expressions had to be construed with reference to the subject matter and the context where the term occurs, regard being given to the scope of the statute and the public purpose it seeks to serve. SC further stated that "The police service is a disciplined service and it requires maintenance of strict discipline. The consequences of these defaults should normally be attributable to negligence".

Contempt of Court:

Having analyzed and discussed in some elaboration various aspects of this case, Division Bench of SC passed the following orders:

The Director Generals, Health Services of UP/Uttarakhand were hereby issued notice under the provisions of the Contempt of Courts Act, 1971 as to why appropriate action be not initiated against them. The above-said officials are hereby directed to take disciplinary action against medical officer, whether he is in service or has since retired, for deliberate dereliction of duty, preparing a report which ex facie was incorrect and was in conflict with the inquest report and statement of SI Kartar Singh. The action even for stoppage/reduction in pension can appropriately be taken by the said authorities against

Medical Officer. Director Generals of Police UP/Uttarakhand were hereby directed to initiate, and expeditiously complete, disciplinary proceedings against, SI Kartar Singh, whether he is in service or has since retired, for the acts of omission and commission, deliberate dereliction of duty in not mentioning reasons for non-disclosure of cause of death as explained by the doctor, not sending the viscera to the FSL and for conducting the investigation of this case in a most callous and irresponsible manner. The question of limitation, if any, under the Rules, would not apply as it is by direction of the Court that such enquiry shall be conducted.

SC held, declared and directed that it shall be appropriate exercise of jurisdiction as well as ensuring just and fair investigation and trial that courts return a specific finding in such cases, upon recording of reasons as to deliberate dereliction of duty, designedly defective investigation, intentional acts of omission and commission prejudicial to the case of the prosecution, in breach of professional standards and investigative requirements of law, during the course of the investigation by the investigating agency, expert witnesses and even the witnesses cited by the prosecution.

Questions for Consideration:

Settled canons of criminal jurisprudence when applied in their correct perspective, give rise to the following questions for consideration of the Court in such type of cases:

- a) Where acts of omission and commission deliberate or otherwise, are committed by the investigating agency or **other significant witnesses instrumental in proving the offence,** what approach, in appreciation of evidence, should be adopted?
- b) Depending upon the answer to the above, what directions should be issued by the courts of competent jurisdiction?
- c) Whenever there is some **conflict in the eye-witness version of events and the medical evidence**, what effect will it have on the case of the prosecution and what would be the manner in which the Court should appreciate such evidence?

Need for Maintaining High Standards:

SC observed that "Police officers and doctors, by their profession, are required to maintain duty decorum of high standards. The standards of investigation and the prestige of the profession are dependent upon the action of such **specialized persons**".

Court further observed that "The **police manual and even the provisions of the CrPC require the investigation to be conducted in a particular manner and method** which, in SC opinion, stands clearly violated in the present case". SC held that "Medical Officer not only breached the requirement of adherence to professional standards but also became instrumental in preparing a document which, ex facie, was incorrect and stood falsified by the unimpeachable evidence of eye witnesses placed by the prosecution on record".

In Ram Bihari Yadav and Others vs. State of Bihar & Ors (1995), SC noticed that if primacy is given to such designed or negligent investigation, to the omission or lapses by perfunctory investigation or omissions, the faith and confidence of the people would be shaken not only in the law enforcement agency but also in the administration of justice.

There is need for adhering to prescribed standard protocols in discharging the medico-legal duties by the investigating officers as well as by the medical officers involved. Professionalism in discharging the duty by the medical officer is need of the hour.

Medical Council of India should take into account these observations by the Hon'ble SC in framing the curriculum for MBBS students and ensure mandatory PM Work in both private and government medical colleges. This will improve the quality of medico-legal work. All concerned including MCI by recognizing medico-legal work including PM work as specialist work will further enhance the credibility of criminal justice delivery system in India. MCI should restore the reduction in number of faculty members in the department of Forensic Medicine. This will be helpful in improving the quality of medical education in medical colleges and students coming out of these medical colleges. There is need to think by the policy makers to amend the existing Section 174 IPC to include / or substitute the word by 'Forensic Medicine Expert' in place of 'Medical Officer'.

Mukesh Yadav Editor

Pattern of Injuries in Homicidal Deaths in Bhopal Region

*Pradeep K. Mishra, **Jayanthi Yadav, *Sandeep Singh, ***B. P. Dubey

Abstract

A serious danger posed in front of humanity is the danger from death by murder. In spite of all the measures, there has been increase in incidence of homicide all over the world including India. The present study was based on retrospective analysis of 218 homicidal deaths in three years period from January 2004 to December 2006 from autopsies done in the Department of Forensic Medicine and Toxicology, Gandhi Medical College, Bhopal and Medico legal Institute, Home (Police) department, Government of Madhya Pradesh. The present study is carried out to assess the most vulnerable age group, sex incidence, seasonal variation, hospitalization, survival time, fatal period, organs involved and weapons used in order to get better perspective of the situation. The incidence of homicide was found to be 3.82%, Male to female ratio was 2.9: 1. Third decade was most affected age group (39.44%). Homicide by physical assault was found in 84.4% cases while asphyxia in 35.6% cases. Stabbing was the most common type of injury (42.9% cases) and head & face was the most common site of body involved (33.5% cases). The data collected is compared with previously published literature.

Key Words: Homicide, Defense Wound, Injury, Survival time, Fatal period, Weapons

Introduction:

Murder, the destruction of an individual, is the most heinous crime that could be conceived of and it is no wonder that society gives a most severe type of punishment as revenge of some magnitude. When a murderer commits a murder he leaves behind a clue to the nature and manner of his conduct in different ways and the knowledge of science is utilized both in its commission and solution. The present study is a retrospective study. The sample of this study no doubt helps in reconstruction of homicidal deaths, where injury was the cause of death.

Material and Method:

This study was based on retrospective analysis of 218 homicidal deaths from January 2004 to December 2006 from the postmortems done in the Department of Forensic Medicine and Toxicology, Gandhi Medical College, Bhopal and Medico-legal Institute, Home (Police) department, Govt. of Madhya Pradesh.

Corresponding Author:

*Assistant Professor, Department of Forensic Medicine & Toxicology R. D Gardi Medical College, UJJAIN- 456006 (M.P), INDIA Email: pradeep_sus1074@yahoo.com **Assoc. Prof., Gandhi Medical College, Bhopal *Assist. Prof., L. N Medical College, Bhopal ***Prof. & Head, Gandhi Medical College, Bhopal DOR: 24.1.12 DOA: 8.6.12 The data includes not only the Bhopal city but surrounding areas also from where cases were referred to the hospital and subsequently died and also includes cases referred for second post-mortem or expert opinion. The data represents all age groups. The burn cases were excluded from this study because homicidal cases due to turn could not be established with certainty.

Proforma for study was prepared and various information and findings were collected from the post-mortem reports like PM No., age, sex, religion, cause of death, fatal injuries, mode of offence, type of weapons used, duration of death, hospitalization and survival time was noted.

Observation and Discussion:

During the study period, total 5707 autopsies were conducted out of which, 218 cases were homicidal, which comprises 3.82%. There was a trend of gradual increase in the total number of autopsies conducted, but no definite pattern observed regarding incidence of homicidal cases. It increased in 2005, and then relatively decreased. (Table 1)

In the present study, incidence of homicide was 3.5% in 2004, which increased in 2005 to 4.5%, and again came down to 3.5% in 2006 with average percentage of 3.82 %. [1-3]

Homicide can occur at any age. It is evident that most affected age group was between 21 to 30 years i.e. total 86 cases (39.4%), followed by 31-40 years age group

53 cases (24.3% having cases) with predominance of male victims in all age groups except for 0 to 10 years where female victims were more (8 victims) than male (3 victims). (Table 2) This suggests that female homicide is more common in first decade [4]. Out of 8 female victims, 3 (37.5%) were having evidence sexual abuse. [5] There was male of predominance with predilection of 3rd and 4th decade. [3, 4, 6-13] The highest incidence in youth may be due to vicarious freedom and escape of youth from parental society.

No significant variation was found in any season, with summer accounting for 33.94% cases, while 33.03% each for winter and rainy season. Spurt was seen in mouth of March with 26 cases (12.5%) and October with 23 cases (11.1%). (Table 3) This spurting might be attributed to festival seasons when more gathering and interaction takes place and when spirits run high, causing confrontation resulting in argument and provocation which may lead to violence. However few studies have found maximum deaths in winter season [3, 7], while Sinha US et al [11] noticed maximum homicidal deaths in rainy season (45.33%), followed by winter (34.67%), then least in summer i.e. 20%.

Maximum number of victims (76.1%) died on spot or found dead at the scene of crime, remaining 52 cases were hospitalized of which 6 cases died within 24 hours 13 cases died within 1 to 7 days. (Table 4) Three cases survived for more than 7 days. [1, 14, 15] While few others reported less than 50% of spot deaths in their studies. [12] The appreciable decrease in survival period may be attributed to an increase in lethality of weapons and the involvement of more than one assailant, despite the advancement of life support to the injured.

This also indicates the intension or reflects the severity with which homicidal injuries are inflicted. Physical assault (mechanical Injury) was the most common mode of offence leading to death in 84.4% cases. [1, 2, 7, 15] Next in common being asphyxia, which comprises 34 cases (15.4%). Strangulation by ligature was the most common means used for asphyxiation, being 22 cases (65.6% of total cases of asphyxia), followed by throttling, in 9 cases (26.5%). Two cases were of smothering and one case was due to drowning. (Table 5) Basappa S Hugor [14] reported 43% deaths due to mechanical injuries.

Stabbing was the weapon of choice for offence (42.9%), followed by blunt weapon (33.7%), then sharp cut in 18.5% and least common was firearm in 9 cases (4.9%). [12, 14, 15] Death due to burn injuries has been excluded in this study because manner of death could not be established with certainty. (Table 6)

As per distribution of injuries are concerned, head and face was the site of choice (39.67% cases) in the present study, of which 82.2% were blunt injuries, about 11% sharp injuries and firearm in 6.8% cases. Out of total 62 blunt injury cases, 96.8% (60 cases) were present on head. [2, 3, 10, 11] This shows the intention with which the injuries are inflicted because brain is the vital organ and injury to it will cause death. (Table 7)

In the present study, stab injuries were most common on chest region alone (in 43% cases), and on abdomen alone in 16.5% cases while chest and abdomen combined was involved in 32.9% cases. [2] If we combine sharp cutting injuries (18.47%) and stab injuries (42.93%) in our study then total sharp cut injuries comes to be 61.4%. [9, 10, 16-17] More use of sharp weapons in our study indicates the intention of the assailant to kill the person because sharp weapons are not generally household weapons and are usually not carried by the person. Finding of stab wounds most commonly in chest region in our study also indicates the intention with which injuries were inflicted because assailant probably knows that vital organs like lung and heart in this region will cause death.

Sharp cutting objects producing incised wound was present in 34 cases (18.47% of fatal injury cases). It was mostly on neck region (cut throat) in 24 cases, followed by head (8 cases) and two case of fatal incised wound was on the extremities. [10] When chest and abdominal organ involvement was analyzed, lungs were found to be most commonly involved (30.9%) followed by heart (20.65% of total physical assault cases). Liver and diaphragm were almost equally involved in about 10-11% cases. But intestine was most commonly involved (17.39%) in abdomen. (Table 8) Abdominal aorta was involved in 8 cases while pancreas in 2 cases. [3, 6, 15, 18]

Homicide by violent asphyxia were observed in 15.59% cases), of which 22 (64.7%) were due to ligature strangulation, while 9 (26.47%) due to manual strangulation, two cases due to smothering and one case was due to drowning. [3, 6] In our study firearm injuries were present in only 9 cases out of 218 homicides, (Table 9) of which majority (55.5%) was in head region. [2, 3, 7, 10, 12, 15] In our country, firearm is less frequent due to strict legislation for possession of firearm. In India, firearm is more prevalent in few areas where smuggling activities are taking place or due to infiltration by terrorists or naxalite. Bhopal is located in the centre of the country and its border does not touch border of any other country or any naxalite area and also terrorist activities are not common here. Hence firearm fatal injuries are less common.

Sharp injuries were leading cause of homicide in countries with strict gun control laws, such as United Kingdom, Canada and Sweden. [19] In the United States, gunshot wounds are leading cause, amounting to 60% of total homicides. [20]

Conclusion:

Although the scope of present study is vast, varied and intricate, yet approach to analyze from autopsy data retrospectively of the homicide victims in the present study focuses on physical and mechanical aspects of injuries observed in this region and compared with comparable findings elsewhere.

The motives and reasons for homicide are known to vary geographically and over time, and the present study elucidates them for this region in the said time frame. The significant involvement of lower age group points the finger to lack of education and proper occupation among youth, makes them more prone to antisocial activities leading to heinous crime like homicide, is quite alarming with population explosion in our setup.

The present study seemed to indicate that the ability to think over a problem, with a balanced and reasonable tolerance has decreased and decisions taken in excitement and incitement have prevailed over the better judgment, which also is attributed to the immature thinking seen among the young adults, allover. To decrease the homicide in this area. educational and socioeconomic status should be improved with providing proper occupation among youth in this community. Strict law and order situation should be maintained. Psychiatric evaluation of criminals should be considered.

The present study is concluded with the hope that the given suggestions and methods will help in reducing the number of homicides.

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| 2004-2006 and homicidal cases | | | | | | |
|-------------------------------|----------------------|-----------------|------------|--|--|--|
| Year | Total Autopsies done | Homicidal Cases | Percentage | | | |
| 2004 | 1790 | 62 | 3.5 | | | |
| 2005 | 1898 | 86 | 4.5 | | | |

70

218

3.5

3.82

 Table 1: Autopsies conducted year wise

 2004-2006 and homicidal cases

Table 2: Age and Sex Wise Distribution

| Age (yrs) Male | | Female | Total (%) |
|----------------|-------------|------------|------------|
| 0-10 | 3 | 8 | 11 (5.05) |
| 11-20 | 19 | 4 | 23(10.55%) |
| 21-30 | 69 | 17 | 86 (39.4) |
| 31-40 | 39 | 14 | 53 (24.3) |
| 41-50 | 15 | 6 | 21 (9.6) |
| 51-60 | 9 | 3 | 12 (5.5) |
| >60 | 9 | 3 | 12 (4.12) |
| Total | 162 (74.3%) | 56 (25.7%) | 218 (100%) |

2006

Total

2019

5707

Table 3: Season Wise Study of HomicidalCases

| Season | 2004 | 2005 | 2006 | Total (%) |
|-----------------------|------|------|------|-----------|
| Summer (Mar-June) | 23 | 28 | 23 | 74 |
| Rainy (July to Oct.) | 21 | 26 | 25 | 72 |
| Winter (Nov. to Feb.) | 18 | 32 | 22 | 72 |
| Total | 62 | 86 | 70 | 218 |

Table 4: Survival Period of Victims

| Survival time | Cases | Percentage |
|---------------|-------|------------|
| Instant death | 166 | 76.1% |
| <12 hour | 12 | 5.5% |
| 12-24 hours | 24 | 11. % |
| 1-2 days | 5 | 2.29% |
| 2-3 days | 1 | 0.45% |
| 3-7 days | 7 | 3.2% |
| 7-30 days | 3 | 1.4% |
| >30 days | 0 | 0 |
| Total | 218 | 100% |

Table 5: Mode of Offence

| Mode of offence | Cases | Percentage |
|---------------------------|-------|------------|
| Physical assault (injury) | 184 | 84.4% |
| Asphyxia | 34 | 15.6% |
| Total | 218 | 100 |

Table 6: Type of Fatal Injuries and Weaponused in Physical Assault Cases

| Type of Injury | Cases | Percentage |
|----------------|-------|------------|
| Blunt Trauma | 62 | 33.7% |
| Sharp/Incised | 34 | 18.5% |
| Stab wound | 79 | 42.9% |
| Firearm | 9 | 4.9% |
| Total | 184 | 100 |

Table 8: Involvement of Body Organs inPhysical Assault Cases (n=184)

| Organ Involved | Cases | Percentage |
|----------------|-------|------------|
| Lung | 57 | 30.9% |
| Heart | 38 | 20.6% |
| Diaphragm | 20 | 10.9% |
| Liver | 19 | 10.3% |
| Spleen | 4 | 2.2% |
| Kidneys | 0 | 0 |
| Stomach | 5 | 2.7% |
| Intestine | 32 | 17.4% |
| Abdomen Aorta | 8 | 4% |
| Pancreas | 2 | 1.1%. |

Table 9: Homicide by Asphyxia

| Method of Asphyxia | Cases | Percentage |
|---------------------------|-------|------------|
| Strangulation by ligature | 22 | 64.7% |
| Throttling | 9 | 26.5% |
| Smothering | 2 | 5.9% |
| Drowning | 1 | 2.9% |
| Total | 34 | 100 |

| | | Table 7 | |
|-------------------|--------|-------------------|------------------------------|
| Fatal Injuries in | Respe | ct to Body Region | and Causative Object (N=184) |
| | 10 1 0 | | |

| Region of body involved | Kind of weapon used | Total | | | |
|-------------------------|---------------------|---------------|----------------------|---------|-------------|
| | Blunt | Sharp cutting | Stabbing or piercing | Firearm | |
| Head & Face | 60 | 8 | 0 | 5 | 73 (39.7%) |
| Neck | 0 | 24 | 0 | 0 | 24 (13.04%) |
| Chest | 0 | 0 | 34 | 1 | 35 (19.02%) |
| Abdomen | 1 | 0 | 13 | 1 | 15 (8.1%) |
| Chest & Abdomen | 0 | 0 | 26 | 0 | 26 (12.5%) |
| Extremities | 1 | 2 | 6 | 0 | 9 (4.9%) |
| Multiple | 0 | 0 | 0 | 2 | 2 (1.1%) |
| Total | 62 (33.7%) | 34 (18.5%) | 79(42.9%) | 9(4.9%) | 184 |

Sexual Harassment in Medical College: KAP Study among Medical Students

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Abstract

Sexual harassment of women at work place is prevalent throughout the Globe. India is no exception especially in health care set up, is a grave form of human rights violation of a almost half of the human folk. The SC in Visakha case (1997) has framed guidelines to deals with sexual harassment of woman at workplace and a Bill is also pending with the Union Government.

This study was conducted to explore the awareness, understanding and reporting patterns of sexual harassment among students of Muzaffarnagar Medical College (UP). A self-reported questionnaire was developed for this study. The result indicated sexual harassment occurred among students, with 21% of all the participants reporting to have been sexually harassed. Reporting of sexual harassment was found to be minimal, with only a 5% of those who were sexually harassed having told someone about the act. The majority of those who were sexually harassed did not make a formal complaint because they were embarrassed or they did not believe any action would be taken. Awareness creation, education and a reporting mechanism are essential ingredients of the response to address this issue.

Key Words: Sexual harassment, Supreme Court guidelines, Awareness in students, Human Rights

Introduction:

Sexual harassment is a human rights violation. It is also a serious cause of concern in health care institution that train students, employ women in various capacities. It affects the attitudes, behaviors, and learning capabilities of medical students. It results in a hostile atmosphere at work, interferes with work performance and can affect patient care. [1]

According to the Protection of Human Rights Act, 1993 "Human rights" means the rights relating to life, liberty, equality and dignity of the individual guaranteed by courts in India.

The Supreme Court has observed that it is the duty of the employer or other responsible persons in work places or other institutions to prevent or deter the commission of acts of sexual harassment. [2]

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*Associate Professor, Dept. of Forensic Medicine Muzaffarnagar Medical College, Muzaffarnagar (UP) E-mail: drvinita7@rediffmail.com **Assist. Prof., Dept. of Pathology Dr. Rajendra Prasad Government Medical College, Tanda, Kangra (HP) ***Prof. & HOD, Dept of Forensic Medicine & Toxicology, School of Medical Sciences & Research, Sharda University, Greater Noida ***Professor & HOD, Dept. of Forensic Medicine, Muzaffarnagar Medical College, Muzaffarnagar (UP) DOR: 30.11.2011 DOA: 03.06.2012 Also to provide the procedure for the resolution, settlement or prosecution of acts of sexual harassment by taking all steps required. [2] Sexual harassment generally occurs when one person, the harasser holds a position of real or perceived authority over the other individual. Harassment of students can occur anywhere in campus, including the classroom, the workplace, or a residence hall. It is estimated that over 50% of all women have experienced sexual harassment in the workplace and 20-30% of all college women have been sexually harassed. [3]

In a study "Sexual harassment at work place: Experiences of women in the health sector" conducted by a researcher, found that sexual harassment in hospitals, of women doctors and nurses, seems to have become a common practice in India.

What's worse, none of them had heard of a complaints committee for redressal of their grievances. Several of the respondents also expressed their skepticism about the grievances committee's effectiveness. The reason: many feared they would be blamed for provoking Sexual harassment. Other worried about loss of reputation after complaining, less job security etc. The study revealed victims were sexually harassed by not only their co-workers but also by patients and their relatives. [4, 5]

Supreme Court defines sexual harassment at work place-"Unwelcome sexually determined behaviors such as physical contact

and advances, a demand or request for sexual favours, sexually coloured remarks, showing pornography and any other unwelcome physical, verbal or non-verbal conduct of sexual nature. [2] The Supreme Court's Judgments requires institutions to take action against harassment. There have been many press reports on Sexual harassment in hospitals. To illustrate; a nurse at leading Mumbai hospital was raped by hospital staff; a professor was accused of harassing women faculty and patients have been sexually assaulted. [6-8]

Sexual harassment can have various consequences on students e.g. students who experience sexual harassment are likely to change their major subject choices, alter career plans or avoid the threating situation and are likely to experience strained work relations and become generally unsatisfied [9,10].

Material and Method:

The study explored the perception, understanding and awareness of sexual harassment among medical students. This study was conducted at Muzaffarnagar Medical College, Muzaffarnagar in year October 2010. Three batches i.e. 2006, 2007, 2008, both male and female M.B.B.S. students were included in the study belonged between 18-24 years age group. A self administered questionnaire consisting of both semi-structured open ended questions as well as closed ended questions was developed and piloted. The questionnaire included questions about perception, understanding, experience, redressal mechanism, complaints filed and any action taken regarding sexual harassment.

We distributed this self administered questionnaire to the students, which were collected within one day. The data was managed by a trained data expert. An informed verbal consent was obtained from the participants prior to their participation. Confidentiality was maintained and participants were free to withdraw from study at any time.

Observations:

The total 269 students of M.B.B.S batch 2006-08 were studied. Total 269 students participated out of which 144 (53.5%) were male and 125 (46.4%) female. The students varied between age group of 18-24 years. The results are as under: (See Table 1 and Table 2)

| Question | Response | e | | | | |
|--|------------|-----------------|-----------------|--------------|-------------|---------|
| | Yes | % | No | | Total | |
| Whether the term "sexual" is a social taboo in filing complaint against such incident? | 224 | 83 | 45 | 17 | 269 | |
| Do you have knowledge of any event of sexual harassment in your work setting that either happened to you or one of your familiar– Yes/No. (If answer is No, skip to question 19) | 54 | 21 | 215 | 80 | 269 | |
| If yes, mention the position of the harassed person- | Student | 96% | Nurses | 2% | Resident | 2% |
| Faculty / Medical Officer / Resident / Student / Technician / Clerk / | 52 | (n=54) | 01 | (n=54) | (n =54) | (n=54) |
| Nurses / Attendant | | | | | | |
| Mention the position of the harasser within the organization (if | Faculty | 46% | Students | 50% | Residents02 | 4% |
| applicable) – | (n=54) | (n=54) | 27 | (n=54) | | (n=54) |
| Faculty / Medical Officer / Resident / student / | | | | | | |
| Technician / Clerk / Nurses / Attendant | | | | | | |
| When did this event occur? (e.gwithin the past one month); | within 6 M | onth to one yea | ar back (n=54) | 100% | | |
| | Yes | % (n=54) | | No | % (n=54) | |
| Did you talk about this event to anyone else in the organization? | 3 | 5% | | 51 | 95% | |
| Is there any Committee or group to inquire into such complaints in your institution / organization? | 0 | 0% | | 54 | 100% | |
| If there is no such Committee in your workplace do you think there is a need for one | 54 | 100% | | 0 | 0% | |
| Give reasons for your choice in the above question? | To create | safe & secure | environment for | r students (| n=54) | |
| Have you heard of the Supreme Court guidelines that mandate the setting up of Committee to inquire into complaints of sexual harassment in the workplace in each institution? | 154 | 57% | | 115 | 43% | (n=26)l |
| Have you heard about any Bill/Act enacted or pending in the Parliament / Raiya Sabha on this issue? | 96 | 35% | | 173 | 64% | |

Table 1: Questions and Response about Sexual Harassment of Women

Discussion:

In this study total 269 students participated out of which 144 (53.5%) male and 125 (46.4%) female students. The students varied between age group of 18-24 years. From the above study it was observed that 83% students agreed that the term "Sexual" is itself

hurdle in filing complaint of sexual harassment incidents. 21% students experienced sexual harassment in their institution. 46% faculty members harassed the students, 50% senior students to their junior students and 4% resident to their juniors. 48% students have faced abusive remark, indirect intimation followed by unwelcome physical contact and advance 38%. Only 5% students talk about incidents of sexual harassment in the Institution.

57% students are aware of the Supreme Courts guidelines that mandate setting up of committee to inquire into complaints of sexual harassment in the workplace in each Institution, only 35% students have heard about Bill/Act related with sexual harassment of woman in the workplace.

In a study conduct by Gervasio and Ruckdeschel, (1992) it estimated that over 50% of all woman have experienced sexual harassment in the workplace and 20-30% of all college woman have been sexually harassed. [11] In a Zimbabeian study (Zindi, 1994) in which all female participants (3500), complained of sexual harassment but 93% indicated that they could not report Sexual Harassment. [12]

In another study done by Menon, A. (2011) overall 67.4% of the respondents indicated sexual harassment had not occurred to them. 32.6% of all respondents had experienced sexual harassment. It was observed that more female academic staff reported having been harassed compared to their male counterparts.

The students better understand explicit statements, repeated humiliation based upon the sex, remarks about sexual activities, exposure to sexually suggestive visual displays, persistent, unwanted sexual attention, physical interference with individuals and overt pressure for sexual favors to sexual harassment of all those who had experienced it close to one in four (24.5%) of the respondents indicated that they had told someone about it. 72.3% female students and 76.3% male students reported they knew what Sexual harassment is. However more female students reported that they did not know what Sexual harassment is. [13]

In a one study conducted by Ramanathan mala et al, the most frequent type of harassment seems to be physical contact and advances (eight) and sexually coloured remarks (eight) other unwelcome physical, verbal or non verbal conduct of a sexual nature (five) and demands for sexual favours (four).

There are also report of voyeuristic behavior and one report of a display of pornography. The teacher used to try and make physical contact and advances during the duty. He also make sexually coloured remarks to post graduate students. The students refrained from complaining as they believed no action would be taken and they would be blamed unnecessarily. However, later they collected enough courage to complain to the authority. The teacher was asked to resign. [14] This may suggest the need for a deliberate policy to address sexual harassment with a sexual harassment policy that is widely circulated the academic community will be able to understand that the institution will not tolerate sexual harassment, it is illegal and against the policy. They will also know where to get professional help. The institution must put measures to protect both men and women in the working and learning environment and ensure that the environment to learning.

Summary and Conclusion:

Awareness of the rights of female employees in this regard should be created in particular by prominently notifying the guidelines (and appropriate legislation when enacted on the subject) in a suitable manner. [15]

When an administrator sees or hears behaviors that certain is harassment, it's his responsibility to stop it right away.

Administrator's acknowledgement of the situation and confirmation of the offender may be enough to end the behavior, but he may have to initiate appropriate corrective action to prevent it from happening again.

This may include reassigning the offender to another department or shift or, eventually termination. In any event, he should immediately report to encounter to your seniors/ supervisor. If any student involved in such activity he can be suspended, expelled, result with held, or be debarred from examinations. The results indicated that the environment at Muzaffarnagar Medical College does not allow complaints about Sexual harassment.

Definite measures for dealing with complaints need to be put in place, so that when a formal complaint is made, the complainants will have access to redress. Ongoing education of those who harass others and their victims is important. This institute needs a distinct institutional policy and action plan on sexual harassment.

A clear mechanism of complaints and regulatory procedures for both students and staff should be in place. Awareness creation and education of all sectors of the community is expected to bear positive results in reducing the occurrence of sexual harassment among academia.

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Table 2Types of Sexual HarassmentChoose the category / categories of events) using the listing provided alongside. Describe the
event in the space provided in your own words (use additional space if needed)

| | Types of Events | No. of Response | % |
|--------|--|-----------------|----|
| А | (Unwelcome) physical contact & advances | 21 | 38 |
| В | Demand or request for sexual favours | 13 | 24 |
| С | Sexually coloured remarks | 2 | 4 |
| D | Display of pornography | 5 | 9 |
| E | Any other unwelcome physical, verbal or non – verbal conduct of a sexual nature | | |
| (I) | Eve Teasing | 13 | 24 |
| (II) | Unsavoury remarks | 13 | 24 |
| (111) | Jokes causing or likely to cause awkwardness or embarrassment | 15 | 27 |
| (IV) | Innuendos and taunts | 26 | 48 |
| (V) | Gender based insults or sexist remarks | 12 | 22 |
| (VI) | Unwelcome sexual tone in any manner such as over telephone (obnoxious telephone calls) and the likes | 4 | 7 |
| (VII) | Touching or brushing against any part of the body and the like | 15 | 27 |
| (VIII) | Displaying pornographic or other offensive or derogatory pictures, cartoons, pamphlets or sayings | 4 | 7 |
| (IX) | Forcible physical touch or molestation | 4 | 7 |
| (X) | Physical confinement against one's will, any other act likely to affect one's privacy & includes any act or conduct by a person in authority & belonging to one sex which denies or would deny equal opportunity in pursuit of career development or otherwise making the environment at the workplace hostile or intimidating to a person belonging to other sex, only on the ground of sex | 1 | 2 |

N=54

Study of Correlation between Length of Thumb and Stature in Uttarakhand Population

*Lalit Kumar, **S. K. Jain, ***Pankaj Mishra

Abstract

Human beings are considered to be bilaterally symmetrical. However, there is an asymmetry in the length of the thumb, index finger of both hands irrespective of sex or handedness; estimation of stature of an individual plays an important role for medico-legal fixation of identity. This study looks into the possibility of estimation of stature from length of thumb.

In this study 200 subjects (100 males and 100 females) between the ages of 21 to 30 years were taken from Uttarakhand (India) population. Their thumb length and height were measured using the standard points mentioned by the previous authors, and data was analyzed statistically for correlation. The results showed a significant correlation between length of thumb and height of the individuals in both sexes. Linear regression equation for stature estimation was calculated. It is therefore concluded that if the thumb length is known, then height of individual can be predicted and vice versa. This could be of help in medico-legal cases for the stature estimation for identification as well as in fixation of identity.

Key Words: Anthropometry, Stature, Thumb length, Uttarakhand population

Introduction:

Identification of an individual is main objective in forensic investigation [1] in which mutilated or fragmented remains is always a challenge for the medico-legal experts. The stature of an individual is an important part of identity of a person and one of the "big fours" of forensic anthropology. [2] Estimation of stature of individual from mutilated or amputated limbs or parts of limbs play an important role in facilitating personal identification in various crime scenes like murder, accidents or natural disasters. [3]

Although various methods and formulae are available for estimation of stature, most of them utilize bones such as femur, tibia, humerus and radius or other bones [4], some from foot dimensions [5], or some from cephalo-facial anthropometry. [6] Very few workers had correlated height and thumb, finger length and phalange length. [7]

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*Assistant Professor, Department of Forensic Medicine and Toxicology Shri Guru Ram Rai Institute of Medical & Health Science, Dehradun, U.K. India 248001 E-mail: dr_lalit303@yahoo.com **Prof. & Head, Dept of Anatomy, Assoc. Prof., Biostatistics, Dept of Community Medicine DOR: DOA: Macdonnel studied 3000 English criminal and compared the stature with length of middle finger. [8] Tyagi et al studied from Delhi. They found accurate or near accurate correlation between stature and finger lengths and have suggested that index finger is best for the prediction of stature in both males and females. [9] Varghese et al studied in Mysore, and found that best finger to predict the height in case of males was found to be left thumb and in case of females it was the right thumb. [10]

In most of the studies, the measurement of finger or thumb was taken from tip of finger (dactylion) to phallangion (metacarpo-phalyngial joint). At the crime scene or in fragmented or mutilated body remains, it is not necessary that separation was done at joint, but it was founded that when separation was done of fingers or thumbs from hand that is at the level of proximal crease of fingers or thumb. So we had taken the thumb measurement from dactylion (tip of thumb) to proximal thumb crease. So that this method will be helpful in estimation of stature from mutilated or amputated thumb in dead as well as taking measurement or prints of thumb from crime scene for living individual. Most studies estimate symmetry using fluctuating asymmetry (FA).

During development, the same genes control development of bilateral traits on the left and right side of the body, thus, the expression of the traits should be identical on both sides. While this exists under ideal conditions, developmental noise can disturb patterns of cell division, differentiation and growth causing subtle deviations.[12] FA is defined as the small, random deviations from symmetry that arise in otherwise bilaterally symmetrical traits as a consequence of developmental noise and developmental instability. [11]

Therefore, fluctuating asymmetry can be used as an indirect measure of developmental instability. Therefore in our study, length of both thumbs was taken. Height of a person increases from intra-uterine life to 20-21 years. [12] Trotter and Glesser found that there is a loss of height for each two decades of age over the age of 30 years. [13] Therefore in present study the age of our subjects was taken between 21 to 30 years.

Materials and Methods:

Participants:

A random sample of 200 normal subjects from Uttarakhand, India was selected for this study and the point of study was Dept. of Forensic Medicine and Toxicology in conjugation with Dept. of Anatomy and Dept. of Community SGRRIM&HS, Medicine. Dehradun. Uttarakhand. Subjects with any physical deformities (congenital or acquired) or previous history of trauma to the hand were excluded from the study. After taking informed consent the following measurements were taken. No special attempt was made to select patients. Patients were also chosen on the basis that they were stable and cooperative with being examined.

The sample consisted of 100 males and 100 females, all were aged more than 21 years and less than 30 years and their family origin were in Uttarakhand state. Consent was taken prior to taking measurements.

Measures:

- Thumb Length: Each subject was asked to place his/ her hand on a white paper with the palm facing downwards keeping the fingers separated and separated with the thumb lying comfortably. To measure the length of thumb a sliding caliper was used. The proximal point, which is radial side of the proximal crease over the 1st metacarpophalyngial joint. The distal point that is dactylion the distal most part of the thumb. The ends of the caliper were placed over these two landmarks and distance between them gave the maximum length of thumb. The length of thumbs was taken on both sides in each subject.
- Height of individual: The subject was asked to stand erect and barefoot against a wall. The feet were kept parallel to each

other. The heels, buttocks and back touched the wall and the head was kept in the eye ear plane, eyes facing forwards. The anthropometer was placed in front the subject, perpendicular to the floor. The lower horizontal bar was brought in contact with head at the vertex, in the mid sagittal plane. The distance between the floor and the horizontal bar gave the height of the person.

Measurements were taken and repeated and mean measures were recorded. The measurements were taken in nearest 0.1 centimeters according to the technique described by Vallois. [14] The results were analyzed statistically.

Result and Discussion:

The correlation between thumb length and stature were studied on both sides in males as well as in females (Table-1 & 2). The results showed a high degree of correlation and were statically significant (p<0.01) between thumb length and stature in both sexes.

Chong et al (1997) [15] and Peker et al (1997) [16] in their study found a significant relationship between foot length, toe length, ankle circumference and calf circumference in students aged between 17 and 25 years. In another study conducted by the same authors Anil et al (1997), they found a significant correlation between foot length and height of the person. [17] Even though the hand length and foot length has been studied in relation to various body parameters.

The present study has shown that there is a significant correlation between thumb length and stature of individual (p<0.01). The results, therefore, indicate that if the thumb length is known, stature can be predicted and if the stature is known, thumb length can be predicted and vice versa.

Conclusion and Recommendation:

All the value showed a high degree of correlation and all values were statically significant (p valve <0.01). Therefore any of the thumbs can be used to calculate height for the male as well as female subjects.

For male, estimation of stature from thumb length-

H=150.966 + 2.687 (Thumb Rt)

H=150.606 + 2.756 (Thumb Lt) For female, estimation of stature from thumb length-

H=131.182 + 4.844 (Thumb Rt)

H=128.487 + 5.163 (Thumb Lt)

This study was done on living subjects; therefore it can be used to estimation of stature of unknown criminals by measuring their thumb length from fingerprints present at crime scene. **References:**

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ankle circumference and calf circumference of Turkish University students aged between 17 – 25 years. Morphologie, 1997; 81 (254): 13 – 18.

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Table 1: Result Obtained for Male Subjects

| Thumb length | Regression equation (Height) | % Explained(r ²) |
|--------------|------------------------------|------------------------------|
| Right thumb | H=150.966 + 2.687 (Thumb Rt) | 0.240 |
| Left thumb | H=150.606 + 2.756 (Thumb Lt) | 0.248 |

Table 2: Result Obtained for Female Subjects

| Thumb length | Regression equation (Height) | % Explained(r ²) | | |
|--------------|------------------------------|------------------------------|--|--|
| Right thumb | H=131.182 + 4.844 (Thumb Rt) | 0.256 | | |
| Left thumb | H=128.487 + 5.163 (Thumb Lt) | 0.249 | | |

Photo 1:



Socio-Demographic and Clinical Profile of Para-Suicide Cases: One Year Prospective Study

*Anand Mugadlimath, *J P Agarwal, **S P Choukimath, *Nagesh Kuppast, ***Mandar Sane, ****S R Hibare

Abstract

Study of socio-demographic and clinical profile of Para-suicide cases was carried out for duration of one year between 15th June 2009 and 14th June 2010 at Sri B. M. Patil Medical College and Hospital, Bijapur, a tertiary referral centre in Karnataka state, South India. Knowledge of para-suicides in North Karnataka region of South India is still limited due to lack of published data; India being a large country with great diversity, factors responsible for para-suicide in one region cannot be generalized and may not be the same at other place. The aim of this study was to describe the socio-demographic and clinical variables of para-suicide cases admitted, risk factors associated with para-suicidal gestures, the presence of psychiatric disorders, etc. All the patients admitted with history of para-suicide were interviewed using a pretested proforma. Psychiatric morbidity was determined with help of consultant psychiatrists by DSM-IV criteria and detailed interview.

Key Words: Para-Suicide; Attempted Suicide; Psychiatric Morbidity; Socio-Demographic Factors

Introduction:

Para suicide is defined as a 'conscious and voluntary act which the individual has undertaken in order to injure himself, and which the individual could not have entirely be certain of surviving, but where the injury has not led to death'. The term 'Para suicide' is used synonymously with 'attempted suicide' or 'deliberate self-harm' to express the fact that it is a phenomenon which is close to or similar to suicide but nevertheless different. [1]

Para-suicide is one of the top five causes of acute medical admissions for both women and men. [2] The rate of para-suicide is 10 times more than the completed suicide. [3] In India, suicide rate is approximately 10.3 per 100,000 populations. [4] Para-suicide is a very important predictor for suicide.

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*Assistant Professor, Dept. of Forensic Medicine and Toxicology, BLDEA's B M Patil Medical College, Bijapur, Karnataka E-mail: dranandmdfm@gmail.com *Assist. Prof., Dept. of Psychiatry **Prof. & HOD, Dept of Psychiatry, *Assist. Prof, Dept. of FMT SSIMS & RC, Davangere; Karnataka ***PG, Dept of FMT, KIMS, Bangalore, Karnataka. ****Lecturer, Dept of FMT BLDEA's B M Patil Medical College Bijapur, Karnataka DOR: 17.2.12 DOA: 18.6.12 An eight year follow-up showed that, amongst patients who were previously admitted with para-suicide, about 13% eventually took their own lives and about twice the expected number died from natural causes. [5]

There are not many published studies regarding para-suicide from North Karnataka region of South India. India is a large country with great diversities of culture, customs, values, socio-economic status. Hence etiological factors responsible for para-suicide in one region cannot be generalized and may not be same at other place. This is evident by the great difference in the prevalence of suicide across the country.

Material and Methods:

This was a prospective cross-sectional study designed for duration of one year between 15th June 2009 and 14th June 2010. After getting clearance from ethical committee, all patients of para-suicide admitted in Sri. B.M. Patil Medical College and Hospital, Bijapur were evaluated on a pretested proforma.

Proforma contained demographic details, along with details of method adopted, intention of the patient, history of previous such attempts. Psychiatric morbidity in this group of patients was determined with help of consultant psychiatrists by DSM-IV criteria and detailed interview.

Results:

Socio-demographic correlates:

Out of 110 cases, there were 60 (54.5%) males, as against 50 (45.5%) females. Age of

subjects ranged from 12 to 65 years. The peak age range for attempting suicide in both sexes was 16-25 years (57.3%) followed by 26-35 years (24.5%). Married subjects (60%) were more in comparison to the unmarried (37.2%). Hindus constituted the majority (94.6%). Majority (58.2%) of the cases came from rural areas of Bijapur and adjoining districts. Agriculturists (26.4%) were the commonest occupational category followed by house wives (22.7%), students (18.2%) and unemployed (12.7%). Most (36.4%) of the victims were educated only up to secondary school and 24.6 % being illiterate. Nearly half (49%) of subjects were from lower socioeconomic status. Majority (59%) were residing in joint families. (Table 1 & 2)

• Psychiatric Disorders:

Psychiatric Disorders were not seen in 59 cases (53.6%). In those diagnosed with psychiatric disorders, major depressive disorders formed majority (24.6%), others in that order being alcohol dependence 8 (7.3%) and depression with alcoholism 5 (4.5%). (Table 3)

• Methods of Attempting Suicide:

A vast majority of the cases (80.9%) consumed one or other kind of Organophosphorus compounds, followed by drug over dosage (9%). Other methods like hanging, consumption of glass pieces were less common methods of attempting suicide. (Table 4)

• Causes of Attempting Suicide:

Family stress (51.8%), marital disharmony (16.4%) and financial crisis (12.7%) were identified as most significant which lead to attempted suicide. (Table 5)

Discussion:

Out of the total 131 cases reported, 110 cases survived the attempt of suicide and 21 succumbed to it. In this study males (54.5%) surpassed females (45.5%) and this is consistent with the other Indian studies. [6-8] Majority of the victims (57.3%) were in the age group 16- 25 years, followed by 26-35 years (24.5%). Most of the Indian studies have also observed 16-35 years as the most risky age group for attempting suicide. [9, 10]

However, a study from Japan reported suicidal attempts to be most common in the age group 50-59 years and one of the reasons suggested by them for this finding is stronger suicidal ideas in older people than that in younger people in Japan. [11] In this study, it is evident that 94.6% of suicide attempt cases were Hindus and 5.6% were Muslims. It seems to be in accordance with general distribution of these religions in general population. Some studies report low suicide rate among Muslims. [12] Regarding the domicile, it is seen that majority (58.2%) of the suicide attempt cases belong to rural background. Our findings are consistent with other Indian studies. [4, 6, 13] Reasons for the higher rates of suicidal attempts in many rural areas may include easy availability of pesticides, lower socioeconomic status and lower levels of education. In contrary to these findings, two studies noted most of the suicidal attempters were urban dwellers. [8, 14]

In our study 60% of cases were married, 37.2% were unmarried and 2.8% were divorced, separated or widowed. Our findings are consistent with Ponnudurai R. [15] Our results are also consistent with Gupta SC et al [16] showing 62% of suicide attempters as unmarried, 32% married, & 6% divorced, separated or widowed.

It is observed that 24.6% were illiterate and only 11.8% of the cases were educated above senior secondary level, whereas 36.4% were educated up to secondary school. This shows that lower educational status is a strong predictor of suicidal tendency. Similar findings have been observed by Shrivastava MK et al. [17] from the occupation of para-suicide victims, it is observed that 26.3 % were agriculturists and 22.7% cases housewives.

A large percentage (31%) was of unemployed (12.7%) and students (18.2%) taken together. Similar findings have been mentioned by Sethi et al [10] who found 29.3% students and 18.7% housewives whereas; Gupta SC et al [16] noted 31% as students and 16% as housewives amongst the suicide attempters. In this study 49% of the para-suicide cases had income less than Rs 5,000 per month and 34.6% had family income ranging from Rs 5,000-10,000 per month. The family income of 16.4% of cases was more than Rs 10,000 per month. These results are in concordance with the study done by Sethi BB et al [10] who also reported that economic hardships are important vulnerability factor for para-suicide.

It is evident that 59% para-suicide cases were residing in nuclear family as compared to 22.8% in joint families and 18.2% in extended joint family. It is seen that nuclear family status is a significant predictor of suicide probability. Perhaps living in nuclear family in the present time is becoming more stressful because of growing competition and increased demands on the part of the individuals. [8]

It is observed that 53.6% of the cases did not have any significant psychiatric illness whereas depression was found in 24.6% of suicide attempters and schizophrenia was present in 1% of the cases. Our findings supports the view of Radomsky ED et al [18], Vijaykumar L et al [19] and Bhatia MS et al [20] who found that depression, schizophrenia and other psychiatric illnesses were significantly present in suicide attempters than general population. Sethi BB et al [10] found neurotic depression in 22.7%, schizophrenia in 10.7% and drug and alcohol addiction in 9.3% of the cases whereas, Gupta SC et al [16] reported neurotic depression in 24%, major depression in 6%, schizophrenia in 12% and drug dependence in 6% of the cases. Ponnudurai R et al [15] and Sato T et al [11] have also observed psychiatric ailment as a significant causative factor in 14% and 16.3% of the attempters respectively. Most (91%) of cases had attempted suicide for the first time while 9% had a single suicidal attempt in the past. A study in India reported a previous suicide attempts in 22% of cases. [21]

Most frequent method of para-suicide was by consuming Organophosphorus compounds (80.9%), followed by over dosage of drugs (9%), consumption of kerosene (4.5%), burns (2.7%) and hanging (2.7%). Similar findings are also reported by the findings of other Indian studies. [6, 15, 21]

Regarding precipitating factors responsible for attempting suicide more than half of the individuals (51.8%) attempted suicide because of family conflicts and quarrels, followed by marital disharmony (16%), financial difficulties (12.7%), failure in examination (5.4%) and psychiatric illness (12.7%). Our findings match with findings of Vijay Kumar et al [19] and Nagendra Gouda MR et al [13^{,1}] who also found the same reasons for para-suicide. They found that the immediate cause for para-suicide is marital problem (51%) followed by other family problems (42%).

Conclusion:

Para-suicide is a major public health problem in North Karnataka region of South India, high incidence was noted among- the age group of 16-25 years, males, rural domicile, married persons, those residing in nuclear family, agriculturists and housewives, low education level, low socio-economic status. Designated psychiatric illness was absent in most of the cases and family stress was identified as most common precipitating factor responsible for para-suicide.

Para-suicide cases are on the rise in third world but they are under-reported due to various reasons and thus the cases that we see, are probably the tip of the iceberg. In order to curb the incidence of para-suicide, effective prevention measures need to be taken in the form of, early identification of suicide prone individuals, provisions of better psychosocial support and a restriction in the sale of Organophosphorus compounds. More importantly psycho-social intervention is needed to alleviate precipitating factors and expert psychiatric evaluation of every para-suicide case must be done.

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| domographic dotominan | Table 1: S | ocio-D | emographi | c Fa | ctors of Para-S | uicide | |
|--------------------------|-------------------|----------|-------------|--------|-----------------|-------------|--|
| Socio-demographic factor | | Male (% |) | Fema | ile (%) | Total (%) | |
| Sex | | 60 (54.5 | %) | 50 (4 | 5.5%) | 110 (100%) | |
| Age | <15 yrs | 00 (00.0 | 0) | 01 (1 | 00%) | 01 (0.9%) | |
| | 16-25 yrs | 33 (52.3 | 8%) | 30 (4 | 7.62%) | 63 (57.3%) | |
| | 26-35 yrs | 15 (55.5 | 6%) | 12 (4 | 4.44%) | 27 (24.5%) | |
| | > 35 yrs | 12 (63.1 | 6%) | 07 (3 | 6.84%) | 19 (7.3%) | |
| Religion | Hindu | 58 (55.7 | 7%) | 46 (4- | 4.23%) | 104 (94.6%) | |
| | Muslim | 02 (33.3 | 3%) | 04 (6 | 6.67%) | 006 (5.6%) | |
| Domicile | Rural | 36 (56% |) | 28 (4 | 3.75%) | 64 (58.2%) | |
| | Urban | 24 (52.1 | 7%) | 22 (4 | 7.83%) | 46 (41.8%) | |
| Marital status | Married | 35 (53.0 | 3%) | 31 (4 | 6.97%) | 66 (60 %) | |
| | Unmarried | 23 (56.1 | 0%) | 18 (4 | 3.90%) | 41(37.2%) | |
| | Widow/Divorced | 02 (66.6 | 7%) | 01 (3 | 3.33%) | 03 (2.8%) | |
| Education | Illiterate | 13 (48.1 | 5%) | 14 (5 | 1.85%) | 27 (24.6%) | |
| | Primary | 11 (55.0 | 0%) | 09 (4 | 5.00%) | 20 (18.2%) | |
| | Middle | 06 (60% |) | 04 (4 | 0%) | 10 (9.1%) | |
| | Secondary | 23 (57.5 | 0%) | 17 (4 | 2.50%) | 40 (36.4%) | |
| | Graduate or more | 07 (53.8 | 5%) | 06 (4 | 6.15%) | 13 (11.8%) | |
| Та | ble 2: Socio-D | emogr | aphic Fact | orso | of Para-Suicide | (Continued) | |
| Socio-demographic factor | | | Male (%) | | Female (%) | Total (%) | |
| Occupation | House Wife | | | | 25(100%) | 25(22.7%) | |
| | Agriculture Labor | | 10 (65 52%) | | 10 (34 48%) | 20/26 3%) | |

| Occupation | House wile | | 25(100%) | 23(22.1%) | |
|-----------------------|---------------------|-------------|-------------|------------|--|
| | Agriculture Labor | 19 (65.52%) | 10 (34.48%) | 29(26.3%) | |
| | Manual labor | 8 (72.73%) | 3(27.27%) | 11(10%) | |
| | Student | 12 (60%) | 8(40%) | 20 (18.2%) | |
| | Government Employee | 6 (100%) | 0 | 6(5.4%) | |
| | Private Employee | 4 (80%) | 1(20%) | 5 (4.5%) | |
| | Unemployed | 11 (78.57%) | 3(21.43%) | 14 (12.7%) | |
| Socio-economic Status | < Rs 5,000 | 30 (55.56%) | 24 (44.44%) | 54(49%) | |
| | Rs 5,000-10,000 | 21 (55.26%) | 17 (44.74%) | 38 (34.6%) | |
| | > Rs 10,000 | 09 (50.00%) | 09 (50.00%) | 18 (16.4%) | |
| Type of family | Nuclear | 35 (53.85%) | 30 (46.15%) | 65 (59%) | |
| | Extended | 10 (50.00%) | 10 (50.00%) | 20 (18.2%) | |
| | loint | 15 (60 00%) | 10 (40 00%) | 25 (22.8%) | |

Table 3: Psychiatric Morbidity and History of Previous Para-Suicide

| Psychiatric morbidity | Male (%) | Female (%) | Total (%) |
|--|-------------|-------------|------------|
| Major Depression | 13 (48.15%) | 14 (51.85%) | 27 (24.6%) |
| Alcohol Dependence | 8 (100%) | 0 (0.0) | 8 (7.3%) |
| Depression with Alcohol dependence | 5 (100%) | 0 (0.0) | 5 (4.5%) |
| Schizophrenia | 1 (100%) | 0 (0.0) | 1 (0.9%) |
| Bipolar Affective Disorder | 1 (1.7%) | 0 | 1 (0.9%) |
| Acute and Transient Psychotic Disorder | 0 (0.0) | 1 (100%) | 1 (0.9%) |
| Borderline Personality Disorder | 1 (33.33%) | 2 (66.67%) | 3 (2.7%) |
| Multi- drug dependence | 3 (100%) | 0 (0.0) | 3 (2.7%) |
| No Psychiatric illness | 28 (45.90%) | 33 (54.10%) | 61 (55.5%) |
| History of previous attempt | 06 (60.00%) | 04 (40.00%) | 10 (9%) |

Table 4: Methods Tried for Para-Suicide Method tried Male (%) Female (%) Total (%) O.P Poisoning 46 (51.69%) 43 (48.31%) 89 (80.9%) Drug over dosage 6 (60.00%) 4 (40.00%) 10 (9%)

| | | 1 1 | .112 / /01 | |
|-------------------------|------------|------------|------------|--|
| Burns | 2 (66 67%) | 1 (33 33%) | 3 (2 7%) | |
| Hanging | 2 (40.00%) | 1 (60.00%) | 3 (2.7%) | |
| Consumption of kerosene | 4 (80.00%) | 1 (20.00%) | 5 (4.5%) | |
| Drug over dosage | 6 (60.00%) | 4 (40.00%) | 10 (9%) | |

Table 5: Precipitating Factors for Para-Suicide

| | Precipitating factors | Male (%) | Female (%) | Total (%) |
|---|-----------------------|-------------|-------------|------------|
| I | Family stress | 29 (50.88%) | 28 (49.12%) | 57 (51.8%) |
| | Marital disharmony | 08 (44.44%) | 10 (55.56%) | 18 (16.4%) |
| | Financial debt/crisis | 12 (85.71%) | 2 (14.29%) | 14 (12.7%) |
| I | Exam stress/failure | 3 (50.00%) | 3 (50.00%) | 6 (5.4%) |
| I | Failed love affair | 3 (60.00%) | 2 (40.00%) | 5 (4.5%) |
| I | Physical illness | 1 (25.00%) | 3 (75.00%) | 4 (3.6%) |
| | Psychiatric illness | 2 (50.00%) | 2 (50.00%) | 4 (3.6%) |
| I | Job stress | 2 (100%) | 0 (0.0) | 2 (1.8%) |
| | | | | |

Estimation of Age by Epiphyseal Union at Ankle Joint in Jaipur Region

* Sanjay Kumar Jain, ** P.N. Mathur

Abstract

Age is an important point usually noted for purpose of identification. The principle means from which a fairly accurate opinion regarding age may be given, especially in early years are teeth, secondary sex characters and ossification of bones. Due to the variations in climate, diet, heredity and other factors affecting the people of different states of India, it cannot be expected to form a uniform criterion of epiphyseal union for whole of India and more and more regional studies should be conducted. Among the epiphyseal union at different joints of long bones Ankle joint is comparatively less studied. The present study was conducted to explore the pattern of bony union at ankle joint in growing population of Jaipur region. A total of 100 individuals (55 boys and 45 girls) of age group 14-20 years were taken and their X-ray was done in S. M. S. Hospital, Jaipur. It shows that complete union at Ankle joint in all females occurs at 16-17 years and all males' shows complete union at Ankle joint in 17-18 years age.

Key Words: Age Estimation, Epiphyseal Union, Ankle Joint, Identification, Ossification

Introduction:

Estimation of reasonably accurate age plays an important role in both, civil and criminal cases like personal identification, fixing of criminal responsibility, judicial punishment, rape, kidnapping, employment, attainment of majority, marriage contract, pension settlement.

Extensive studies carried out for age estimation by bony union in India and abroad. From these studies it is found that there is variation in the timing of union of epiphysis of bones and this is attributed to factors like climate, heredity, race, nutrition, dietary habit, gender and socioeconomic status of the population.

Central Government appointed a Survey Committee [1], which recommended that regional data are important and Zone wise study should be conducted. Keeping in view the above facts the present study conducted to explore the pattern of bony union at ankle joint in growing population of Jaipur region. It is presumed that such a study may aid in the degree of accuracy in the existing protocol by incorporating the data analysed in the local circumstances.

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Aims and Objectives:

- 1. To access the general maturity for a known chronological age in both gender.
- 2. To study the average age of fusion of ossification centres around ankle joint.
- 3. Comparative study of fusion of ossification center at ankle joint in boys and girls.
- 4. Comparative study of fusion of ossification center at ankle joint in boys and girls with available data of previous worked carried out in India.
- 5. Comparative study of fusion of ossification center at ankle joint in boys and girls with previously available foreign data.

Material and Methods:

The present study conducted in the Department of Forensic Medicine and Toxicology of S. M. S. Medical College and hospital, Jaipur. The subjects are selected randomly from S M S Medical College, Nursing College and various schools of Jaipur.

Selection Criteria for Inclusion of Person in Present Study:

For selection of subjects, following facts were recorded and considered:

- 1. They should be living in Jaipur region for more than 5 years.
- 2. They should be free from any physical disability or endocrinal disorder.
- 3. They must be having an accurate record of date of birth.
- 4. Informed verbal consent of all the subjects were taken before proceeding to their

physical, dental and radiological examinations.

The persons selected for study were grouped as per their stated age, viz: 14-15 years, 15-16 years, 16-17 years, 17-18 years, 18-19 years, and 19-20 years.

Age, as stated by them is further confirmed by their birth certificate, school record and secondary school certificate. Persons belonging to above age group are included in study irrespective of their socioeconomic, religious and educational status.

After obtaining their informed verbal consent for their clinical and radiological examinations, their physical examination was conducted in department of Forensic Medicine and X-ray examination for ankle joint was conducted in the Department of radio diagnosis, S M S Hospital Jaipur. Then skiagrams are studied in detail in reference to various ossification centres, their appearance, process of fusion and post fusion scarring.

Radiological Criteria for Epiphyseal Fusion:

The union is taken as complete when the:

- 1. Diaphyseo-epiphyseal space is completely obliterated and become bony in architecture and density.
- 2. There is continuity of the periosteum between epiphysis and diaphysis with no notching at the periphery of epiphyseal line.
- 3. The presence or absence of epiphyseal scar (a white, transverse line) has been disregarded in this connection and considered as recent complete union.

For generalization, fusion in more than 75% cases is considered as complete fusion.

Data Collection:

Radiological data of appearance and fusion of various ossification centres were reduced to tables of various age groups along with other physical data noted previously. These data were once again examined by experts in Forensic Medicine and Radio-diagnosis. Data thus obtained finally, were analysed and compared with the published Indian and foreign works.

Observation and Discussion:

The present study has been conducted on 100 subjects (55 boys and 45 girls) falling in the age group of 14-20 years. In school going cases age was confirmed by birth certificate and from the record of school and from the student of college age was verified by secondary school certificates. All the subjects were bonafied residents of Rajasthan and were residing in Jaipur for more than five years and were free from physical and mental illness, disability and endocrinal disturbances.

Physical and dental examination was conducted in the Department of Forensic Medicine and radiological examination was conducted in the Radio-diagnosis Department of SMS Medical College Hospital, Jaipur. Findings of the same were recorded in the Master Chart.

In males fusion of epiphysis of lower end of Tibia occurs at 17- 18 years age group. These findings are in accordance with Flecker [2], Davies & Parson [3], Banrejee & Agarwal [4], Naraian & Bajaj [5] and not in accordance with Galstaun. [6] (Table 1)

In males fusion of epiphysis of lower end of Fibula occurs at 17-18 years age group. These findings are in accordance with Flecker [2], Davies & Parson [3], Banrejee & Agarwal [4], and Naraian & Bajaj [5] and not in accordance with Galstaun. [6] (Table 1)

In females fusion of epiphysis of lower end of Tibia occur at16-17 years age group. These findings are in accordance with Hepworth [7], Pillai [8], and Banerjee & Agarwal [4] and not in accordance with Galstaun [6], Basu & Basu. [9] (Table 2)

In females fusion of epiphysis of lower end of Fibula occur at16-17 year age group. These findings are in accordance with Pillai [8], Banerjee & Agarwal [4], and not in accordance with Galstaun [6], Basu & Basu. [9] (Table 2)

Table 3: Comparison of age of DistalEpiphyseal Union of Tibia in various Regionsby present study

| Sr No | Researcher | Region | Age of Observation (years) |
|----------|----------------------|-----------|-------------------------------|
| 1 | Davies and Parson | England | 17-18 |
| 2 | Hepworth | Punjab | 16.5-17.5 |
| З | Flecker | Australia | 14(F), 17(M) |
| 4 | Pillai | Madras | 14-17 |
| 5 | Galstaun | Bengal | 14-15(F), 16(M) |
| 6 | Basu and Basu | Bengal | 14-15(F) |
| 7 | Banerjee and Agarwal | Delhi | 16-17(F), 17-18(M) |
| 8 | Naraian and Bajaj | U.P. | 17-19 |
| 9 | Present study | Jaipur | 16-17(F), 17-18(M) |

F- Female, M- Male

Table 4: Comparison of age of DistalEpiphyseal Union of Fibula in variousRegions by present study

| <u> </u> | | | |
|----------|----------------------|-----------|--------------------|
| Sr | Researcher | Region | Age of Observation |
| No | | | (years) |
| 1 | Davies and Parson | England | 18 |
| 2 | Hepworth | Punjab | 17-18 |
| 3 | Flecker | Australia | 14(F), 17(M) |
| 4 | Pillai | Madras | 14-17 |
| 5 | Galstaun | Bengal | 13-15(F), 14-16(M) |
| 6 | Basu and Basu | Bengal | 15(F) |
| 7 | Banerjee and Agarwal | Delhi | 16-17(F), 17-18(M) |
| 8 | Naraian and Bajaj | U.P. | 17-19 |
| 9 | Present study | Jaipur | 16-17(F), 17-18(M) |

Table 2: Progress of Epiphyseal Union atAnkle Joint in Girls

| Age grps (yrs) | Distal End Of Tibia (%) | Distal End of Fibula (%) |
|-------------------|----------------------------|--------------------------|
| 14-15 | 34 | 34 |
| 15-16 | 71 | 71 |
| 16-17 | 100 | 100 |
| 17-18 | 100 | 100 |
| 18-19 | 100 | 100 |
| 19-20 | 100 | 100 |

 Table 1: Progress of Epiphyseal Union at

 Ankle Joint in Boys

| Age grps (yrs) | Distal End Of Tibia (%) | Distal End of Fibula (%) |
|-------------------|----------------------------|--------------------------|
| 14-15 | 0 | 0 |
| 15-16 | 30 | 40 |
| 16-17 | 60 | 60 |
| 17-18 | 100 | 100 |
| 18-19 | 100 | 100 |
| 19-20 | 100 | 100 |
| F- Female, M- Ma | ale | |

Conclusion:

On the basis of observation and discussion of the present work it is found that in female fusion occurs earlier as compared to males by about one year at the ankle joint .As compared to studies conducted in other states of India it is found that in present study fusion occurs same as occurs in Punjab, Delhi & U. P. and later then the Bengalis.

So it is recommended that more and more zone wise studies should be conducted as such studies may aid in the degree of accuracy by incorporation of the data analysed under local circumstances.

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Sexual Dimorphism in Cranial length, breadth and Cephalic Index

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Abstract

Sex determination of skeletons has always been of importance in anthropology. Various parts of a skeleton are useful in sex determination such as the pelvis, femur, tibia, humerus, radius, mandible and cranium. Among these, the skull can be used to ascertain individual sex with high accuracy. Most of the previous studies of sex differences in the skull were centred on morphological traits in a descriptive manner whereas the recent studies are focused on morphometry or craniometry in largely quantitative and statistical aspects.

The study was conducted in the Department of Forensic Medicine, Gandhi Medical College Bhopal (M.P.). A total of 160 skulls (100 males and 60 females) of adult age were included in the present study. The cranial length and breadth were measured with spreading caliper and cephalic index was calculated using these values. On statistical analysis the study concluded that the cranial length, breadth and cephalic index were found useful parameters for determining sex of an individual from skull (p<0.01 for cranial length and breadth and p<0.05 for cephalic index).

Key Words: Craniometry, Cranial length, Cranial Breadth, Cephalic index, Sex determination

Introduction:

Most times particularly in forensic studies, one is confronted with the identification of sex of the individual from the skeletal remains. The skull appears to be the main reliable bone apart from the pelvis exhibiting sexually dimorphic features.[1] Other bones such as clavicle, calcaneous, radius and ulna had also been found useful in some cases, although there exist regional and racial variations in the skeleton.[2] Preadolescent bones are almost useless in sex identification as they show little or no dimorphic features or dimension due to the fact that the secondary sexual characteristics do not develop save for hormonal influence at puberty.[3] For identification of sex from skeletal remains structural (morphological) as well as (morphometric) measurable features are considered. However morphological methods are subjective and morphometric methods are based on osteometric measurements and are statistical techniques.

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*Assistant Professor, Department of Forensic Medicine and Toxicology, Gandhi Medical College, Bhopal E-mail: drmurli_30@yahoo.co.in **Associate Professor ***Professor, Chirayu Medical College, Bhopal ****Professor and Head, GMC, Bhopal DOR: 10.11.12 DOA: 26.11.11 They reduce the examiner's subjective judgement and have high reproducibility. [4] Measurement of length, breadth and cranial index of human skull are significant parameters for sex determination. Few studies have been done in this direction, hence this study was undertaken to determine the sex from skull in Bhopal region of Central India.

Materials and Methods:

The metric study for determination of sex from dry human crania was done in the department of Forensic Medicine Gandhi Medical College, Bhopal (M.P.), during the year 2005-2006. All the skulls used for the study were adult. Only the intact, undamaged skulls with known sex and without any injury, pathology or congenital anomaly were selected for the study. Of the total 160 skulls studied 100 were male skulls and 60 were female skulls. Spreading caliper was used to measure the dimensions.

The landmarks on the skull selected for the study were-

- **Glabella (G)**: The most forwardly projecting point in the mid-saggital plane at the lower margin of the frontal bone, which lies above the nasal root and between supercilliary arches.
- **Opisthocranion (Op)**: The most posteriorly protruding point on the back of braincase, located in the mid-sagittal plane. Opisthocranion almost always fall on the superior squama of the occipital bone, and

only occasionally on the external occipital protuberance.

• Euryon (Eu): The most laterally positioned point on the sides of the braincase. Euryon always falls on either the parietal bone or on the upper portion of the temporal bone and may be determined only by measuring maximum cranial breadth.

Measurements:

- Maximum Cranial Length (G-Op)– Measured from glabella (G) to opisthocranion (Op), in mid-sagittal plane, using spreading calliper.
- Maximum Cranial Breadth (Eu-Eu)– Measured from right euryon to left euryon

Index:

• Cephalic Index (Length-Breadth Index) (C.I.): It is the ratio of maximum transverse diameter (maximum breadth Eu-Eu) of skull to maximum antero-posterior diameter (Maximum length, G–Op) of the skull. It is denoted as –

Maximum cranial breadth

The data obtained was analysed statistically to find out the range, the mean and standard deviation. The observations were statistically computed and 'Z' test was used to the level of significance measure for determination of sex. The 'p value' was determined to find out whether the sexual differences between means were significant or not. These measurements and index were used to study sexual dimorphism in the skulls.

Observation and Results:

The result of both the measurements i.e. maximum cranial length and maximum cranial breadth were found to be higher in male skulls. The difference in the male and female sex was also found to be highly significant on applying the statistical tests.

1. Maximum Cranial Length (G-Op):

The length varied from 16.72-19.33 cms (mean = 17.93) for males and 16.08-18.22 cms (mean = 17.18 cms) for females. The 'Z' test for length was 8.32 (p < 0.01), which reveals the highly significant difference between male and female cranial length.(Table 1)

2. Maximum Cranial Breadth (Eu-Eu):

The maximum cranial breadth varied from 11.62 - 14.08 cms (mean = 12.87 cms) for males and 11.81 - 13.8 cms (mean = 12.54 cms) for females. The 'Z' test was 4.73 (p <

0.01), suggests significant difference between male and female cranial breadth. (Table 2)

3. Cranial Index:

Cranial Index varied from 63.04-78.82 (Mean=71.79) for males and 67.08-81.24 (mean = 73.01) for females. 'Z' test was 2.28 (P <0.05) suggest the significant difference between male and female cranial index. (Table 3)

Discussion:

Skull is one of the commonest parts of the skeleton used to opine on the sex of an individual. Sexual dimorphism is insignificant in the pre-pubertal age group. Although adult skulls show a few nonmetric and metric differences, there is paedomorphic tendency in the human skull of either sex. [5]

Absolute sexual difference seldom exists. [6] Hormones, nutritional status, cultural differences and environmental factors affect these variations. Skulls from different geographical areas vary much. [7] Skull shapes may also vary within a population and even among the closely related. Generally speaking dimensions of the male are larger than those of the female craniometric data. [8]

In a craniometric study on 220 adult dry human skulls, Pathi et.al, found the maximum antero-posterior length for male 160–187 mm with a (Mean –174.7<u>+</u>6.64) and for female 158– 180 mm (Mean–169.3 <u>+</u> 5.82) He reported significant difference between male and female cranial length (P<0.01). Measurement of cranial breadth of male and female skulls were 12.0– 15.0 (Mean 13.31<u>+</u>0.53) and 11.7–13.7 (Mean 12.79<u>+</u>0.37) and show marked similarity with the present study perhaps due to the common racial origin of the skeletal material. [9]

Shah and Jadhav done a study on 500 medical students varying in age from 17 to 23 years. His findings of cranial length, breadth and cephalic index are very much similar to those obtained in the present study. He summarized that the sex of an individual can be accurately determined with these head measurements. [10]

Sexual dimorphism between the genders increases with increasing age. Sexual differences in skull are better projected as one attains adulthood. [11] In a recent study population from Italy was analysed for the prevalence and expression of endocranial characters as well as for the presence of some ectocranial epigenetic traits. Many differences in males and females are the result of allometric trajectories, with males shifted to be a larger size. [12] Gender differences with respect to the mean cranial length and cranial breadth were found to be significantly larger in males

compared to females (p<0.001) by Ilayperuma from Sri Lanka. Priyanka et al, Pathi et al, Shah and Jadhav also reported that males have significantly higher cephalic index than males. [9, 10, 11, 13]

Zavando et al from Brazil, while studying the linear dimensions of the skull, found cranial length to be a highly significant differentiating point between the sexes, whereas cranial breadth although significant was less so than cranial length. [13, 15]

In a study conducted on dried skulls in Thailand cranial length and cephalic index was seen to vary significantly between the sexes. However cranial breadth was not significantly variable. [8] Studies by many others also substantiate this gender variation, though the metric values varied depending upon the racial population examined.

The skull is relatively narrow and long in some people, while in other it is nearly as wide as it is long. Differences in this respect are measured by means of the "cephalic index". Cephalic index is usually rather higher in women than in men, owing to relatively greater breadth. [16] Cephalic index is a useful anthropometric parameter utilized in the determination of racial variations. It is also used to determine sexual differences, especially in individuals whose identity is unknown. [10) It is one of the clinical anthropometric parameter recognized in the investigation of craniofacial skeleton because of its validity and practicality. [18]

The mean cephalic index in different ethnic groups varies significantly in different geographical zones. According to Bharati et al in tropical zones head from is longer (dolichocephalic), but in temperate zones head from is round (mesocephalic or brachycephalic). [19] Variations in cephalic indices between and within populations have been attributed to a complex interaction of genetic and environmental factors. [20, 21]

The mean cephalic indices within different Indian groups were shown be within a range from 79.50 to 80.81. [10] In addition, the cephalic phenotypes among these groups were shown to vary from predominantly mesocephalic to brachycephalic. [10] Cranial dimensions have been shown to depend on gene expression and since gene expression differs in various racial and ethnic groups it becomes a determining factor. [21]

In the present study cephalic index of the males varies between 63.04–78.82 (Mean– 71.86) and for females 67.08–81.24 (Mean– 73.01). There was found to be a significant variation between the genders, with female skulls being relatively broader than the male skulls. A study from Punjab also reported similar results. [22] However, another study on North Indian population (Age group 17-20 years) shows that there was no significant gender difference in the Cephalic Index in subjects from northern regions of India. [23]

Contrary to the present study Adejuwon et al while conducting a study on the population of the South-western Nigeria found that there was no significant difference in the cranial index of male and female skulls. Also in their study the cranial index for males is higher than that of females, perhaps due to the racial differences. [7] In an anthropometric study of cephalic indices of the Ogonis in Nigeria done by Oladipo et al they concluded that the male and female in their study belong to the same geopolitical region of Nigeria and they have the same origin, but there is a highly significant difference between the sexes in their indices. [24]

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Table1: Range, Mean and Standard Deviation of Maximum Cranial Length (G-Op)

| Parameter | Male (n=100) | Female (n=60) |
|----------------------|-------------------|-------------------|
| Range | 16.72 – 19.33 cms | 16.08 – 18.22 cms |
| Mean | 17.932 cms | 17.18 cms |
| S.D. | 0.596 | 0.514 |
| Mean <u>+</u> 3 S.D. | 16.14 - 19.72 | 15.64 - 18.72 |

Z test- 8.32, p value < 0.01, Inference - Highly significant

Table2: Range, Mean and Standard Deviationof Maximum Breadth (Eu-Eu)

| Parameter | Male (n=100) | Female (n=60) |
|----------------------|-------------------|--------------------|
| Range | 11.6 – 14.08 cms | 11.81 – 13.8 |
| Mean | 12.87 | 12.54 |
| S.D. | 0.488 | 0.409 |
| Mean <u>+</u> 3 S.D. | 11.41-14.33 | 11.31-13.77 |
| 7 toot 172 p.vol | ia 20.01 Informan | Highly Significant |

Z test- 4.73, p value <0.01, Inference – **Highly Significant**

Table 3: Cephalic Index of male and female skulls (cranial length-breadth index)

| Parameter | Male (n=100) | Female (n=60) |
|----------------------|----------------------|---------------|
| Range | 63.04-78.82 | 67.08-81.24 |
| Mean | 71.86 | 73.01 |
| S.D. | 3.45 | 3.18 |
| Mean <u>+</u> 3 S.D. | 61.51-82.21 | 63.47-82.55 |
| 7 toot 2 20 p.vo | luo < 0.05 Inforance | Significant |

Z test- 2.28, p value < 0.05, Inference – Significant

Table 4: Comparison of Cephalic Index inVarious Studies

| Sr No | Workers | Year | Males | Females |
|-------|-----------------------------|------|--------|---------|
| 1. | Present study | 2007 | 71.86 | 73.01 |
| 2. | Shah and Jadhav | 2004 | 80.42 | 81.20 |
| 3. | Ilayperuma | 2011 | 78.04 | 79.32 |
| 4. | Adejuwon et al | 2011 | 72.97 | 71.72 |
| 5. | Eroje et al (Significant) | 2010 | 73.68 | 72.24 |
| 6. | Odalipo et al (significant) | 2009 | 111.18 | 75.09 |
| 7. | Sangvichien et al | 2007 | 83.07 | 85.84 |
| 8. | Mahajan et al | 2010 | 81.34 | 85.75 |
| 9. | Anitha M. R. et al | 2011 | 79.14 | 80.74 |

Profile of Snakebite Cases Admitted at a Tertiary Care Centre

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Abstract

Snakebite is an important and serious health problem of Uttarakhand more so in far-flung and rural areas. The aim of the present study was, to know the epidemiological profile of Snakebite cases admitted at a tertiary care centre in the Kumaun Region of Uttarakhand. A total 168 cases of Snakebite envenomation were analyzed during the five year period from January, 2007 to December, 2011. Out of 168 cases, 61.90% were male. Most common age group was 21-30 years and male to female ratio was 1.62: 1. The majority of Snakebites occurred at day time (84.52%) and the lower limb was the most preferred site of bite (53.57%). The most common species was Krait (45.23%) followed by Cobra (25%), and majority of victims were admitted between 2nd and 6th day (65.47%). The mortality rate was 8.33% and respiratory failure was the most common cause of death.

Key Words: Snake bite, Epidemiological profile, Uttarakhand, Health problem, Krait, Cobra

Introduction:

Venomous snakebite is an important public health hazard in tropical and Subtropical countries. [1, 2] In India 35,000-50,000 lives are lost per year due to venomous snakebite. [1] Most of the deaths due to Snakebite in rural areas are still unidentified because many villagers they go to traditional Practioners first before visiting any medical centre. However, reliable data for the morbidity and mortality are not available since there is no proper reporting system and snakebite is not a notified disease in medical fraternity.

The Snakes most commonly associated with human mortality in India are Cobra (Naja naja), Krait (Bungarus Caeruleus) Russell's viper (Vipera russelli) and saw scaled viper (Echis carinatus).

Snakebite incidences vary from region to region and depend upon:

- (i) The natural habit of particular species of Snakes in the region; and
- (ii) Probability of human being coming in contact with the snake. [3]

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Dept. of Forensic Medicine & Toxicology Dr. Sushila Tiwari Memorial Government Hospital & Government Medical College, Haldwani-263139 District-Nainital, Uttarakhand E- mail: mohan98972007@gmail.com * Associate Professor, Dept. of Medicine *Assoc. Prof., Dept. of Medicine *Assoc. Prof., Dept. of Medicine *Assoc. Prof., Dept. of Obstetrics & Gynecology **Professor and Ex. Head, Dept. of Medicine DOR: 16.03.12 DOA: 09.07.12 The aim of the present study was, to know the epidemiological profile of Snakebite cases admitted at a tertiary care centre in the Kumaun region of Uttarakhand.

Material and Methods:

This study was conducted between January, 2007 to December, 2011 in the department of Medicine, Dr. Susheela Tewari Memorial Government Hospital and Government Medical College, Haldwani which is the only referral centre for whole Kumaon region of Uttarakhand and has got all the facilities for management of Snakebite cases.

A total of 168 cases of Snakebite were analyzed during this period. The details of each case were entered in the standard Performa which highlighted the main points age group and sex of victims, male to female, ratio, socioeconomic status, place of residence, most Common species and circumstances of bite, the symptoms noticed at the time of admission, the treatment instituted and final outcome, All data were analyzed, documented and interpretated as per the said protocol.

Observation:

A total 168 cases of Snakebite were analyzed, between January, 2007 and December, 2011. Majority of the cases were male (61.90%) and male to female ratio was 1.62:1. The most common age group was 21-30 years (32.14%). Snakebites were commonly seen among lower / lower middle class 60.71% and 29.76% respectively, and 78.57% cases came from rural areas. (Table 1) The majority of snakebites (84.52%) occurred at day time and the lower limb was the most preferred site of bite (53.57 %). (Table 2)

In the present study, highest number of bites were seen in the period from June to September (69.03%) and where the biting species were identified in 122 cases (72.61%). The most common was Krait (45.23%) followed by Cobra (25.00%) and few cases of Viper (2.38%) also identified. As shown in table-3 and 4 respectively. The Majority of victims were admitted to the hospital between 2nd and 6th day (65.47%), as shown in table-5. The distance from the place of referral to our hospital varied from 1 km to 280 km. quite a good number of cases in transit spent more than 10 hours to reach our hospital. Out of 168 cases of snakebites envenomation, only 14 (8.33 %) were proved to be fatal, as shown in table-6. The major cause of death in these cases was respiratory failure.

Discussion:

Snake bite is an important and serious problem of Uttarakhand, especially in rural areas. It was reported earlier, that the majority of snake bites (82%) occur among the rural population. [4] Species involved in the snake bites are krait, cobra and viper in Kumaon region of Uttarakhand. Although presence of King Cobra has been reported in some areas of Nainital District of Uttarakhand, however till date no King Cobra bite has been reported.

In our study most of the cases admitted were neurotoxic snakebite (Krait & Cobra) except few cases of Viper bite. Majority of them were male (61.90%) and they were in age group of 21-30 years (32.14%) and male to female ratio was 1.62:1, which was consistent with other studies. [5-7] The Predominance of male victims suggests a special risk of outdoor activity. Interestingly, it was observed in our study that majority of the victims of snakebite were belonging to low-socio economic class and most of them were labourers or agricultural workers. Similar findings have been reported in some other studies. [6-8]

It was reported that the lower limb was the most preferred site of bite and peak incidence of snakebites recorded in day time. Similar observation noted in previous study. [5] In our study the highest number of bites was seen in the period from June to September. Similar observations were noted in other study. [9] The possible reason for majority of Snakebite in rainy season may be due to flooding of rain water in the dwelling places of Snakes, that causing their dislodgment. The mortality rate observed in earlier studies ranged from 1.3% to 10.1%. [5, 10-12] In present study it was also quite high (8.33%). It might be due to delay in arrival (most of the patients reported between 2nd and 6th days), poor transport facilities and non-availability of medical facilities in remote areas or receiving traditional treatment first.

Conclusion:

It can be inferred from our study that in remote areas of Uttarakhand health care resources are limited and a large part of population remains exposed to the risk of snakebite. Hence adequate public education and awareness, early initiation of therapy, improved infrastructure, less reliance on traditional therapy, could go a long way in helping to reduce mortality and morbidity due to snakebite, which is indeed a potentially treatable condition.

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| Table 2 | 2: \$ | Site | of | Bite | and | Time | of | the | Day | |
|---------|-------|------|----|------|-----|------|----|-----|-----|--|
|---------|-------|------|----|------|-----|------|----|-----|-----|--|

| Site of | bite | Cases | Percentage |
|---------|--------------|-------|------------|
| • | Upper limb | 48 | 28.57 |
| • | Lower limb | 90 | 53.57 |
| • | Trunk | 8 | 4.76 |
| • | Face / Scalp | 22 | 13.09 |
| Total | | 168 | 100% |
| Time | | cases | Percentage |
| • | Day | 142 | 84.52 |
| • | Night | 26 | 15.47 |
| Total | | 168 | 100% |

Table 4: Types of Snakebite (n=168)

| 1 | Poisonous | Cases | Percentage |
|---|---|----------------------|---------------------------------|
| | Krait Cobra Viper Unidentified | 76 42 04 18 | 45.23 25.00 2.38 10.71 |
| 2 | Non-poisonous | 28 | 16.66 |
| | Total | 168 | 100% |

Table 3: Month Wise Distribution ofSnakebite Cases (N=168)

| Month | Cases | Percentage |
|-----------|-------|------------|
| January | 1 | 0.59 |
| February | 1 | 0.59 |
| March | 6 | 3.57 |
| April | 10 | 5.95 |
| May | 16 | 9.52 |
| June | 23 | 13.69 |
| July | 33 | 19.64 |
| August | 30 | 17.85 |
| September | 30 | 17.85 |
| October | 14 | 8.33 |
| November | 4 | 2.38 |
| December | 0 | 0.00 |
| Total | 168 | 100% |

Table 6: Death and Survival (n=168)

| | Cases | Male | Female |
|------------------------------|-------|--------------|-------------|
| Death | 14 | 9 (64.28%) | 5 (35.71%) |
| Survived | 154 | 95 (61.68%) | 59 (38.31%) |
| Total | 168 | 104 (61.90%) | 64 (38.09%) |

Table 1: Socio-Demographic Profile of Snake Bite Cases (N = 168)

| 1 | Age (years) | Number | Percentage |
|---|----------------------|---------|------------|
| | 01 – 10 | 9 | 5.35 |
| | 11 – 20 | 43 | 25.59 |
| | 21 - 30 | 54 | 32.14 |
| | 31 – 40 | 33 | 19.64 |
| | 41 – 50 | 19 | 11.30 |
| | 51 – 60 | 5 | 2.97 |
| | 61 and above | 5 | 2.97 |
| | Total | 168 | 100% |
| 2 | Sex | Numbers | Percentage |
| | Male | 104 | 61.90 |
| | Female | 64 | 38.09 |
| | Total | 168 | 100% |
| | Male: Female | 1.62:1 | |
| 3 | Socioeconomic Status | Number | Percentage |
| | Lower Class | 102 | 60.71 |
| | Lower Middle Class | 50 | 29.76 |
| | Upper Class | 16 | 9.52 |
| | Total | 168 | 100% |
| 4 | Residence | Number | Percentage |
| | Rural | 132 | 78.57 |
| | Urban | 36 | 21.42 |
| | Total | 168 | 100% |

Table 5: Time of Presentation (n=168)

| | Time | Cases | Percentage |
|-------|---|-----------------|------------------------|
| • | First 24 hours 2 nd and 6 th day 7 th and 15 th day | 46 110 12 | 27.38 65.47 7.14 |
| Total | | 168 | 100% |

Potassium Ion & Alkaline Phosphatase Level in Vitreous Humour and their Role in Postmortem Interval

*Bindu Sharma, **Amit Kumar, ***A. K. Srivastava

Abstract

Bio-chemical and enzymatic changes are observed in blood & most of the body fluids which usually starts immediately or shortly after death. These changes progress in a fairly orderly fashion until the body disintegrates which is used by Forensic Pathologists/ biochemists in estimation of time passed since death.

In this study potassium ion and alkaline phosphatase is estimated in vitreous humor at different intervals from 225 dead bodies brought to the mortuary of LLRM Medical College, Meerut for postmortem examination. Vitreous potassium levels were found increasing gradually from 4 - 15.62 mEq/L in first 60 hrs but no definite change in alkaline phosphatase concentration in early 42 hrs and then inconsistent changes were observed. All the data were analyzed statistically and inferred that vitreous potassium levels are highly significant in estimating time passed since death but not the alkaline phosphatase.

Key Words: Time since death; Potassium; Alkaline phosphatase; Postmortem interval

Introduction:

Evaluation of time passed since death is one of the most important objects of conducting post mortem examination. It is usually estimated on the basis of gross changes in the body/tissues such as rigor mortis, hypostasis, decomposition etc. [11] Forensic pathologists/ biochemists are also trying to estimate post mortem interval from enzymes and bio-chemical changes in blood, CSF and other body fluids. [4, 5, 7 &12] Amongst there vitreous humor is widely explored for their chemical variations with time since death. [1, 2]

Here in this study, the concentration of potassium ion & alkaline phosphatase in vitreous humour is estimated at different post mortem intervals and tried to develop a correlation with time since death. Attempt is also made to explore the role of age, sex and cause of death in these cases. All the data thus collected are compiled, statistically evaluated & presented in the paper.

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Material & Methods:

For the estimation of potassium ion & alkaline phosphatase vitreous humor is collected from the 225 dead bodies of known time since death, brought to the mortuary of LLRM Medical College, Meerut for post mortem examination irrespective of their age, sex & cause of death. The cases, where eyes are damaged due to trauma, infection or disease or when vitreous humor is coagulated or contaminated with blood, are not included in the study. Only clear fluid is taken for estimation of potassium ion & alkaline phosphatase.

Vitreous humor is collected from the posterior chamber of the eyes by needle aspiration through a puncture made 5-6 mm away from the limbus without tearing the loose fragments of tissues and collected in a rubber stopper vial. Syringe and vials must be washed properly with de-ionized double distilled water and dried in hot air oven before use. After aspiration of vitreous humor liquid paraffin gel was injected in the posterior chamber to avoid collapse of eye ball.

The samples were taken immediately to the Department of Biochemistry, Subharti Medical College, Meerut for chemical analysis. Each sample was centrifuged at 3000 rpm for 10 minutes and the supernatant fluid was divided into 2 parts for determination of potassium & alkaline phosphatase by Vitros 250 Fully Auto analyzer & the values were expressed in mEq/L and IU/L respectively. [8, 14]

Observation & Results:

Vitreous humor was collected from the dead bodies, irrespective of age, sex, cause and varying time since death up to 130 hrs. (Table 1, 2) The level of potassium ion in vitreous humor rises from 4 to 15.62 mEq/ L as the time passes after death. (Table 3) This rise was more consistent in first 60 hrs after which potassium ion may slight fall and/or stationary up to 96 hrs and then rise again. The vitreous potassium rises gradually in first 36 hrs in the rate of 1 mEq/L per 12 hrs and then faster at the rate of 3mEq/L in next 12 hrs and reaches 13.68 to14.24 mEq/L at 60 hrs passed after death. (Table 4) It was also observed that cause of death has no effect on vitreous potassium level.

It is nearly equal in all type of deaths and increases directly with the increase of post mortem interval. Statistically p value is >0.05 which indicates vitreous potassium concentration is highly significant with time since death and can be used for the estimation of post mortem interval.

The concentration of alkaline phosphatase in vitreous fluid also varied from 0.18 to 12.32 IU/L in different situations but not increased proportionally with time passed since death. (Table 5) Actually there is no significant changes in alkaline phosphatase concentration in initial first 42 hrs after death and then irregularly afterwards. So it cannot use for estimation of time since death. Here Z value is less than 2 (p>0.05) which indicates the change in the concentration of alkaline phosphatase with time since death is not significant and cannot be used for the estimation of post mortem interval.

Discussion:

Naumann studied first on human postmortem vitreous fluid & demonstrated a rise in vitreous potassium levels but did not attempt to correlate this with postmortem interval. [10] Afterwards vitreous potassium ion concentration in dead bodies and its correlation with time since death was studied by various workers throughout the world. [3, 12]

A linear rise of potassium was observed in 12-100 hrs after death [3, 11 & 12]. The same is also observed in present study where there is a linear rise of potassium ion conc. in first 60 hrs after death. The potassium ion concentration was found 4.64-4.83 mEq/L in first 6 hr, 5.38-5.6 in 6-12 hrs, 6.49-6.75 in 12-24 hrs, 7.41-7.71 in 24-36 hrs, 10.29-10.71 in 36-48 hrs &13.68-14.24 mEq/L in 48-60 hrs after death which can be used in establishing time of death. The factors like age, sex, temperature and cause of death have no appreciable effect on the concentration of vitreous potassium. [13] The same is also found in this study.

The concentration of vitreous alkaline phosphatase in dead bodies ranges from 0.18 to 12.32 IU/L in this study but there is no direct relation with time passed since death. (Fig 1) It was seen that there is minimal change in alkaline phosphatase concentration in the initial stage up to 42 hrs after the death and then increases irregularly which cannot be used for estimation of time since death. The same is observed by other workers and inferred that vitreous alkaline phosphatase is not a reliable criteria for estimation of time of death. [6, 9] The higher level of alkaline phosphatase after a considerable time could be due to retinal cell breakage.

Conclusion:

- 1. Concentration of potassium ion rises in vitreous humor in first 60 hrs after death irrespective of age, sex and cause of death.
- 2. This increase is directly proportion with time passed since death. So it can be taken as a method of establishing post mortem interval.
- The potassium ion concentration was found 4.64-4.83 mEq/L in first 6 hr, 5.38-5.6 in 6-12 hrs, 6.49-6.75 in 12-24 hrs, 7.41-7.71 in 24-36 hrs, 10.29-10.71 in 36-48 hrs &13.68-14.24 mEq/L in 48-60 hrs after death which can be used in establishing time of death.
- 4. There is no significant change in alkaline phosphatase concentration in first 42 hrs and thereafter rises, but inconsistent, so it cannot be considered as criteria for estimation of time since death.

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Fig. 1: Relation between the Averages Mean Concentrations of Vitreous K+ & Alkaline Phosphatase &Time since Death



Table 1: Age & Sex Wise Distribution

| Age grp (yrs) | Male (%) | Female (%) | TOTAL (%) |
|---------------|------------|------------|-----------|
| 0-10 | 11(4.88) | 13(5.78) | 24(10.67) |
| 11-20 | 22(9.78) | 14(6.22) | 36(16.00) |
| 21-30 | 37(16.44) | 19(8.44) | 56(24.89) |
| 31-40 | 23(10.22) | 15(6.67) | 38(16.89) |
| 41-50 | 18(8) | 10(4.55) | 28(12.44) |
| 51-60 | 16(7.11) | 14(6.22) | 30(13.33) |
| 61-70 | 13(5.78) | 00(00) | 13(5.78) |
| TOTAL | 140(62.22) | 85(37.78) | 225(100) |

Table 4: Relationship between the Average Vitreous K+ Concentrations & Time since Death

| Boath | | |
|------------------|-------------------|------------------------|
| Time Since Death | Range of vitreous | Average K ⁺ |
| (hrs.) | K⁺(mEq/L) | (mEq/L) |
| 0-6 | 4.64-4.83 | 4.73 |
| 6-12 | 5.38-5.6 | 5.49 |
| 12-24 | 6.49-6.75 | 6.62 |
| 24-36 | 7.41-7.71 | 7.56 |
| 36-48 | 10.29-10.71 | 10.5 |
| 48-60 | 13.68-14.24 | 13.96 |
| 60-72 | 13.15-13.69 | 13.42 |

| Table 2 | | | | | | |
|--------------------------------------|---------|--|--|--|--|--|
| Cases According to Cause & Time sinc | e Death | | | | | |

| Cases According to Cause & Time Since Death | | | | | | | |
|---|------------|-----------|---------------|------------------------------|-----------|--|--|
| Time since death (hrs.) | Trauma (%) | Burn (%) | Poisoning (%) | Sudden but Natural Death (%) | Total (%) | | |
| 0-6 | 7(3.11) | 3(1.33) | 15(6.67) | 15(6.67) | 40(17.78) | | |
| 6-12 | 11(4.89) | 11(4.89) | 0 | 7(3.11) | 29(12.89) | | |
| 12-24 | 37(16.44) | 31(13.78) | 5(2.22) | 11(4.89) | 84(37.33) | | |
| 24-36 | 10(4.44) | 4(1.78) | 3(1.33) | 5(2.22) | 22(9.77) | | |
| 36-48 | 10(4.44) | 4(1.78) | 0 | 5(2.22) | 19(8.44) | | |
| 48-60 | 0 | 0 | 0 | 4(1.78) | 4(1.78) | | |
| 60-72 | 5(2.22) | 4(1.78) | 0 | 4(1.78) | 13(5.78) | | |
| 72-96 | 0 | 0 | 0 | 4(1.78) | 4(1.78) | | |
| >96 | 3(1.33) | 3(1.33) | 0 | 4(1.78) | 10(4.44) | | |
| Total | 83(36.89) | 60(26.67) | 23(10.22) | 59(26.22) | 225(100) | | |

Table 3

Average Concentration of Potassium in Vitreous Humor as per Time Since Death

| Time since death (hrs.) | Trauma | Burn | Poisoning | Sudden but Natural Death | Total (average) | Z value |
|-------------------------|------------|------------|-----------|--------------------------|-----------------|---------|
| 0-6 | 4.58±0.69 | 4.97±0.75 | 4.54±0.68 | 4.82±0.72 | 4.73±0.71 | 3.24** |
| 6-12 | 5.33±0.95 | 5.76±1.03 | - | 5.6±1.0 | 5.49±0.98 | 5.1** |
| 12-24 | 6.42±1.28 | 6.95±1.39 | 6.36±1.27 | 6.75±1.35 | 6.62±1.32 | 6.8** |
| 24-36 | 7.33±1.45 | 7.94±1.56 | 7.26±1.43 | 7.71±1.52 | 7.56±1.49 | 3.09** |
| 36-48 | 10.19±2.85 | 11.03±3.09 | - | 10.71±3.0 | 10.5±2.94 | 3.57** |
| 48-60 | - | - | - | 14.24±1.7 | 13.96±1.66 | 2.12* |
| 60-72 | 13.02±1.02 | 14.09±1.10 | - | 13.69±1.07 | 13.42±1.05 | 8.63** |
| 72-96 | - | - | - | 10.6±0 | 10.39±0 | - |
| >96 | 12.94±0.76 | 14.01±0.82 | - | 13.61±0.8 | 13.34±0.78 | 9.93** |

NS- Not Significant, **- High Significant, * -Significant

Table 5

Average Alkaline Phosphatase Concentration in Vitreous Humor as per Time since Death

| Time since death (hrs.) | Trauma | Burn | Poisoning | Sudden but Natural Death | Total (Average) | Z value |
|-------------------------|-----------|-----------|-----------|--------------------------|-----------------|----------|
| 0-6 | 3.58±3.22 | 3.87±3.49 | 3.54±3.18 | 3.8±3.39 | 3.69±3.32 | 0.79(NS) |
| 6-12 | 2.85±2.68 | 3.09±2.9 | - | 3.0±2.81 | 2.94±2.76 | 0.58(NS) |
| 12-24 | 3.40±2.85 | 3.69±3.1 | 3.36±2.82 | 3.6±3.0 | 3.51±2.94 | 0.38(NS) |
| 24-36 | 3.93±3.26 | 4.25±3.53 | 3.89±3.23 | 4.13±3.43 | 4.05±3.36 | 1.51(NS) |
| 36-48 | 6.9±3.46 | 7.47±3.75 | - | 7.25±3.64 | 7.11±3.57 | 1.10(NS) |
| 48-60 | - | - | - | 4.23±3.21 | 4.14±3.16 | 1.57(NS) |
| 60-72 | 4.51±4.07 | 4.9±4.41 | - | 4.74±4.28 | 4.65±4.2 | - |
| 72-96 | - | - | - | 12.57±0 | 12.32±0 | 0.42(NS) |
| >96 | 5.76±4.25 | 6.24±4.6 | - | 6.06±4.47 | 5.49±4.38 | - |

NS- Not Significant, **- High Significant, * -Significant
Original Research Paper

Accidental Burns Death in Southern Marathwada Region

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Abstract

Accidental burn injuries meet the commonest mode of burn deaths. In this article our aim is to find out commonest mode, gender, age group in accidental burns death. This was a Prospective study of accidental burn deaths of 149 cases from January 2011 to December 2011carried out at Government Medical College, Latur. Among all cases of accidental burn 44 were males and 105 were females. Kerosene burner (stove) is commonest causative factor of accidental burning, followed by kerosene lamp and least cases noted in spark burn. Hence other substances which are less inflammable such as solar lamp, smokeless chullah, solar cooking devices, and electric lamp should be encouraged. Cases of female preponderance were observed as they are most commonly exposed to kitchen work. Such type of cases should be carefully noted to rule out manner of death. Careful observation is the need of hour.

Key Words: Burns, Accidental, Kerosene, Deaths, Spark burn, Smokeless chullah

Introduction:

Deaths due to burns are common in India. Accidental deaths due to burn are most common manner of death in India. As per NCRB Report on accidental deaths -burns was the sixth leading un-natural (accidental) cause of death in India. [1] Careful assessment during autopsy is essential regarding the manner of death to rule out suicidal and homicidal nature. Study on accidental burn deaths was not carried out in our region. So the present study was conducted in our region to assess the burn deaths and its accidental nature.

Material and Methods:

A prospective study of accidental burn deaths during the period of 01 January 2011 to 31 December 2011 was carried out at Forensic Medicine Department, Government Medical College, Latur. Total 795 autopsies were conducted at autopsy center out of which 188 (23.6%) autopsy cases were of death due to burns. Amongst them, 149 (79.3%) cases were of accidental burns with 44 males and 105 females. Information regarding demographic profile and incidence was taken from police inquest, relative of deceased, and hospital records.

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All cases of burns which were homicidal / suicidal in nature were excluded.

Results:

Accidental burn death was observed in 79.3 % of cases while non-accidental burn death was observed in 20.7% in our study. (Table 2) It was observed that females (70.5%) were most common victims as compared to males (29.5%). If we combine age group of 21-30 and 31-40 then it was observed that 67% of cases belong to this age group. Least number of cases (2.6%) seen in age group of 1-10, 61-70 and more than 70 age group. (Table 2)

It was observed that cases of married victims were 79.8% as compare to unmarried victims 20.2% in this study. (Table 3) Kerosene burner (57.5%) was commonest causative agent followed by Kerosene lamp 13.40% cases. Spark burn (2.6%) was least common causative agent in this study. (Table 4)

It was seen in our study that Kitchen (71.1%) was commonest place of burning. Least common place of burning was Angan (3.3%). (Table 5) Sari (88.5%) was the commonest cloth worn by females. Gown was the least common cloth weared by females. Shirt and Pant were the commonest clothing worn by males while Kurta was least common cloth. (Table 6)

In present study it was seen that maximum no. of cases (53.2%) was seen in range of percentage of burn 75>100 while minimum no. of cases (8.0%) was seen in body involving 100 % of burn. (Table 7)

Discussion:

It is well known fact that accidental deaths constitute most common manner of

death and it was proved by various studies. Among accidental deaths burns constitutes significant group. Accidental burn death is the most common manner of death than suicidal and homicidal burn death in India. [2-4] Out of 188 cases of burns during 12 months study period, 149 (79.3%) were accidental burns while 39 (20.7 %) were non-accidental burns i.e. most of the cases were accidental.

Present study showed that females (70.5 %) were most common victims as compared to males (29.5%).Same was observed in studies by Ambade V.N. et al [5], Chavan K.D. et al. [4] Also the present study showed that in both males and female group death due to accidental burns was most common in married peoples (79.8%) as compared to unmarried (20.2%).

It is because most of the victims were between third and fourth decade of life which constituted total (67%) of the cases and these is the age group in which most of the people are married. It is also the most active period of life where the persons struggle for earning their livelihood and undergoes under various stress.

In present study the commonest causative agents was kerosene in one or other way (70.9%) while kitchen (71.1%) was the most commonest site of incidence. Most of the victims were females and this is due to the fact that they are most commonly exposed to flame during kitchen work.

Similar findings were studies done by Agarwal et al [6], Singh et al [7] Jayaraman et al. [8] Most of females in the study were wearing sari and was involved in 88.5% of the total accidental cases. Similar observations were noted by Ambade V.N. et al [5] and Ghuliani et al. [9]

Conclusion and Suggestion:

- Most of the cases in this study were of females. Most of the deaths were from younger age group obviously because these are most active group and actively working and doing hazardous work.
- Most of the death were found in person who are wearing loose clothing, synthetic clothing.
- Kerosene was the most important vehicle. This might be because of more use of kerosene being in rural area & poor socioeconomic conditions. Hence other substances which are less inflammable such as solar lamp, smokeless chullah, solar cooking devices, and electric lamp should be encouraged.

- It is well known fact that females burns are most common than males as they are most commonly exposed to kitchen work.
- It was noticed that proper precautions was not taken while working with fire. It can be concluded that most of deaths were preventable.
- Educate the people about hazards of fire through school education mass media. Encourage the use of less hazardous method for cooking.

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| Table 1: Burn | Deaths | According | to | Manner |
|---------------|--------|-----------|----|--------|
|---------------|--------|-----------|----|--------|

| Manner of burn death | Males (%) | Females (%) | Total (%) |
|-------------------------|-------------|-------------|-------------|
| Accidental | 44 (73.5%) | 105 (82%) | 149 (79.3%) |
| Non-Accidental | 16 (26.5 %) | 23 (18%) | 39 (20.7%) |
| Total | 60 (31 %) | 128 (69%) | 188 (100%) |

Table 2: According to Age & Sex

| | | • | |
|-----------|-----------|-------------|-----------|
| Age group | Male (%) | Females (%) | Total (%) |
| 1-10 | 02 (4.5%) | 02(1.9%) | 04(2.6%) |
| 11-20 | 05(11.4%) | 21(20%) | 26(17.4%) |
| 21-30 | 24(54.6%) | 50(47.6%) | 74(49.6%) |
| 31-40 | 06(13.6%) | 19(18%) | 26(17.4%) |
| 41-50 | 04(9.2) | 06(5.7%) | 10(6.7%) |
| 51-60 | 01(2.2%) | 01(0.9%) | 02(1.3%) |
| 61-70 | 02(4.5%) | 02(1.9%) | 04(2.6%) |
| >70 | 0(0%) | 04(3.8) | 04(2.6%) |
| Total | 44(29.5%) | 105(70.5%) | 149(100%) |

Table 5: Place of Accidental Burning

| Place of burning | Males (%) | Females (%) | Total (%) |
|------------------|------------|-------------|------------|
| | (n= 44) % | (n=105) % | |
| Kitchen | 21 (47%) | 85 (80.9%) | 106(71.1%) |
| Living room | 09(20.4%) | 09(8.5%) | 18 (12.1%) |
| Angan | 0 (0%) | 05(4.7%) | 05 (3.3%) |
| Outdoor | 14 (31.8%) | 06 (5.7%) | 20 (13.4%) |
| Total | 44(29.5%) | 105(70.5%) | 149(100%) |

| Causative agent | Male (%) | Female | Total (100%) |
|----------------------|------------|------------|--------------|
| | | (%) | |
| | (n=44) % | (n=105) % | |
| Kerosene burner | 15 (34%) | 70 (66.6%) | 85(57.5%) |
| Diva(kerosene lamp) | 05(11.3%) | 15 (14.2%) | 20(13.4%) |
| Chula | 0 (0%) | 07(6.6%) | 07(4.6%) |
| Cooking gas LPG | 0 (0%) | 05 (4.7%) | 05(3.3%) |
| Person fall on flame | 02(4.5%) | 03 (2.8%) | 05(3.3%) |
| Spark burn | 04(9.0%) | 0 (0%) | 04(2.6%) |
| While saving other | 10(22.7%) | 0(0%) | 10(6.7%) |
| burning person | | | |
| Not known | 08 (18.1%) | 05(4.7%) | 13(8.7%) |
| Total | 44 (29.5%) | 105(70.5%) | 149(100%) |

Table 4: According to Causative Agent

Table 3: According to Marrital Status

| Marrital Status | Males (%) | Females (%) | Total (%) |
|-----------------|------------|-------------|------------|
| Married | 29 (65.9%) | 90(85.7%) | 119(79.8%) |
| Unmarried | 15 (34.1%) | 15 (14.3%) | 30(20.2%) |
| Total | 44 (29.5%) | 105 (70.5%) | 149(100%) |

Table 7: According to Percentage of Burn (Rule of Nine)

| Percentage of Burn | Males (%) | Females (%) | Total (%) |
|-----------------------|------------|-------------|------------|
| 100% | 07 (15.9%) | 05 (4.7%) | 12 (8.0%) |
| 75>100 | 20 (45.6%) | 59 (56.3%) | 79 (53.2%) |
| 60>75 | 05 (11.3%) | 21 (20%) | 26 (17.4%) |
| 50>60 | 05 (11.3%) | 10 (9.5%) | 15 (10.0%) |
| >50 | 07 (15.9%) | 10 (9.5%) | 17 (11.4%) |
| Total | 44 (29.5%) | 105(70.5%) | 149(100%) |

Table 6: Distribution of Clothes Worn by Deceased

| Clothes on body | Males (%) | Females (%) | Total (%) |
|-----------------|------------|-------------|------------|
| | (n=44) % | (n=105) % | |
| Sari | 0 (0%) | 93 (88.5%) | 93 (62.4%) |
| Gown | 0 (0%) | 02 (1.9%) | 02(1.3%) |
| Salwar | 0 (0%) | 07 (6.6%) | 07 (4.6%) |
| Shirt/pant | 24(54.5%) | 0 (0%) | 24 (16.1%) |
| Dhoti | 05(11.3%) | 0(0%) | 05 (3.3%) |
| Kurta | 02(4.5%) | 0 (0%) | 02 (1.3%) |
| Trouser | 13 (29.5%) | 0(0%) | 13 (8.7%) |
| Other | 0(0%) | 03 (2.8%) | 03 (2.1%) |
| Total | 44 (29.5%) | 105 (70.5%) | 149(100%) |

Original Research Paper

Retrospective Study of Intra Uterine Death Cases at a Tertiary Care Centre of Kumaon Region of Uttarakhand

*Usha Rawat,*Pankaj Singh, *G.S.Titiyal, *Vandana, **Shailendra Singh, ***Chandra Prakash

Abstract

This study was done retrospectively at Govt. Medical College Haldwani from 1st January 2010 to 30th November 2011. And all the cases of IUD after 28 week of gestation were taken in study. During this period total 2872 deliveries were conducted out of which 130 cases of intra uterine death (95.26/1000birth). According to etiology 20% were eclampsia & PIH, 18.5% Ante Partum Haemorrhage (APH), 24.6% Intra Uterine Growth Retardation (IUGR) other causes were rupture uterus 6.1%, congenital malformation 7.7%, obstructed labour 7.7%, transverse lie 7.7% etc.

Intra uterine death can be decreased by improving the medical facility. Skilled birth attendant and ante natal care are strongly associated with lower incidence of fresh stillbirth and maternal mortality. Thus improving the quality of intra partum care can reduce the rate of fresh stillbirth and maternal mortality. Emergency obstetric care is one as initiated by Government of India to reduce the maternal & foetal death. For exact cause of IUD we should go for postmortem of dead foetus after delivery.

Key Words: Intra uterine death, APH (ante partum hemorrhage), Labour, Eclampsia, PIH

Introduction:

Intra Uterine Death [IUD] of foetus is one of the greatest tragedies in the obstetrics and defined as all foetal death occurring after 28 weeks gestation, both during pregnancy and during labour. When the foetus dies in the utero in antenatal period it is usually retained in the uterus for some days before it is expelled and usually result in the delivery of a macerated still birth. Death during labour ends in a delivery of fresh still birth. The etiology of IUD may be placental, maternal, foetal and unknown 25%-35%. The foetal death rate is number of the foetal death /1000 infant born. In 2005 national average stillbirth rate was 6.2/1000birth and in 2009 it was 2.64 million.

Material & Methods:

The present study comprised of all cases of intra uterine death [IUD] at Obstetrics & Gynaecology Department of Govt. Medical College, Haldwani Nainital [UK].

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*Associate Professor, Dept. of Obstetrics & Gynaecology Government Medical College, Haldwani, Nainital E-mail:usha358@gmail.com * Assoc. Prof. Dept. of Orthopaedics * Assoc. Prof. Dept. of Ophthalmology *Assoc. Prof. Dept. of Obstetrics & Gynaecology ** Assist. Prof. Dept. of Orthopaedics *** Prof. & HOD, Dept. of FMT DOR:16.03,12 DOA: 09.07.12 The period of study was from 1st January 2010 to 30st November 2011, which is the biggest referral centre of Kumaon region of Uttarakhand.

During this period total 2872 deliveries were conducted out of which 1258 lower Segment Caesarian Section [LSCS] & 1614 vaginal deliveries. All patients were evaluated with special reference to incidence, etiological factor and clinical feature of the IUD patients.

Observation:

During the period of study there were 2872 deliveries, out of which 130 were IUD cases 4.5% of all. During the study period total no of deliveries were 2872. Out of which 1258 were LSCS & 1614 were vaginal deliveries (including breech, forceps delivery, normal vaginal delivery preterm delivery, still birth etc).

In GMC Haldwani rate of LSCS is very high [43.8%] because this is the tertiary care hospital and one of the referral centre of Kumaon. According to age group highest incidence of IUD cases were seen in 20-25yrs & 26-30yrs age group that is 35.3%. Least common <20yrs & >36yrs old females [1.5%]. (Table 1)

According to parity highest incidence of IUD cases were seen in G2-G4 that is about 56.9%. (Table 2)most of the patient were either from lower class 87/130 [66.9%] or from lower middle class 28/130[21.5%].Only few patient were from upper middle class15/130 12.3%. (Table 4)

According to literacy, most of the patient were either illiterate or <5th class education. 20% Cases were <34weeks gestational period, 49.2%cases were term, 13.8%cases were >40 weeks of gestational period. (Table 3)

According to etiology cases of PIH & eclampsia were 26/130 [20%]. Cases of antepartum haemorrhage [APH] were 24/130[18.5%] including both placenta previa and abruptio placentae which came as bleeding per vagina.

Highest incidence of IUD was seen in intrauterine growth retardation [IUGR] patient about 24.6%. Anaemia was seen in 21.5% cases of IUD patient. Congenital anomaly was seen in7.7% IUD patient. Obstructed labour7.7% and transverse lie 7.7% is also common cause of IUD. Rupture uterus 6.1% is also one of the cause of IUD. Patient of Rh negative were only 3.1 %. (Table 5)

Discussion:

In 2009 the estimated global number of the still birth was 2.64 million with 97% occurring in developing countries. [1, 2] Because still birth data are often inaccurate and under reported especially in developing countries [3], other 1-2million stillbirths likely occur but are not recorded. In developing countries data are primarily on the hospital based deliveries, whereas a high proportion of the deliveries take place at home. [4] WHO has defined still birth as fetal loss beyond 20 weeks, or if gestational age unknown, birth weight (BWT) >500gm or 22weeks. [7]

Incidence of IUD In our study is about 45.26/1000.which is quite high. However in the US >50% of stillbirth occur before the 20 weeks of the gestation. [9] We have done study from 28weeks onwards. In the least developed African countries such as Malawi and Zambia stillbirth rate are 40-50/1000birth are common. In Latin America with middle and less developed countries, stillbirth rate are 15-25/1000births.

Most countries in the Middle East have rates 10-20/1000births. South Asia has the world's largest population and highest stillbirth burden, which rates generally remain highest in Sub Sahara Africa f/b Southern Asia and Latin America. [3] Over the last decades in many developing countries stillbirth rate remain steady or declined only slightly. [10, 11] A study of stillbirth in Latin America and Caribbean found modest declines. [12]

In contrast ,in the US and developed countries, impressive declined in stillbirth rates have occur over the last several decades, associated with improvements in antenatal and delivery care. [10, 11, 13, 14]

In our study 66.9% cases were from lower socioeconomic status which is as studied by Bartlett LA et al [5] In our study according the etiology of IUD 20% cases were of PIH, 24.6%cases were of IUGR. [6, 8] Because PIH is vasoconstrictive disease result in decreased blood flow causing poor fetal growth and hypoxia often result in stillbirth. Here early delivery and medical treatment can reduce the stillbirth. 18.5% cases were of ante-partum haemorrhage [APH] which is more than the text. [15] Congenital malformation was seen in 7.7% less than the text. [15]

Conclusion:

Intra uterine death can be decreased by improving the medical facility. Skilled birth attendant and ante natal care are strongly associated with lower incidence of fresh stillbirth and maternal mortality. Thus improving the quality of intra partum care can reduce the rate of fresh stillbirth and maternal mortality.

EmOC [emergency obstetric care] is one as initiated by Govt. of India to reduce the maternal & foetal death. For exact cause of IUD we should go for postmortem of dead foetus after delivery.

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Table 1: According to Age of Patient (N=130)

| Age (yrs) | Cases | % |
|-----------|-------|-------|
| <20yrs | 2 | 1.5% |
| 20-25yrs | 46 | 35.3% |
| 26-30yrs | 46 | 35.3% |
| 31-35yrs | 34 | 26.1% |
| 36-40yrs | 2 | 1.5% |
| >40vrs | 0 | 0% |

Table 2: According to Parity (N=130)

| Gravida | Cases | % |
|---------|-------|-------|
| PRIMI | 46 | 35.3% |
| G2-G4 | 74 | 56.9% |
| >G5 | 10 | 7.7% |

Table 3: According to the Gestational Period (WEEKS; N=130)

| IN WEEKS | CASES | % |
|----------|-------|-------|
| 28-34wks | 26 | 20% |
| 34-36wks | 22 | 16.9% |
| 37-40wks | 64 | 49.2% |
| >40wks | 18 | 13.8% |

Table 4: Socio-economic Status (N=130)

| Socio-economic Status | Cases | % |
|-----------------------|-------|-------|
| Lower class | 87 | 66.9% |
| Lower middle class | 28 | 21.5% |
| Upper middle class | 15 | 12.3% |

Table 5: Etiological Wise Distribution of Cases

| Etiology | Cases | % |
|--------------------------------|-------|-------|
| PIH & eclampsia | 26 | 20% |
| MSL | 2 | 1.5% |
| APH ante partum haemorrhage | 24 | 18.5% |
| IUGR | 32 | 24.6% |
| ANAEMIA | 28 | 21.5% |
| FIBRIOD | 2 | 1.5% |
| Rupture uterus | 8 | 6.1% |
| Twin | 2 | 1.5% |
| Preterm | 6 | 4.6% |
| Congenital malformation | 10 | 7.7% |
| Obstructed labour | 10 | 7.7% |
| Rh -ve | 4 | 3.1% |
| Cord Prolapse | 2 | 1.5% |
| Anti phospholipid syndrome | 0 | |
| Pre mature rupture of membrane | 6 | 4.6% |
| Transverse lie | 10 | 7.7% |

Original Research Paper

Pattern of Injuries due to Fatal Road Traffic Accidents in Rural Haryana: An Epidemiological Survey

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Abstract

Research across the globe has proved that like all other accidents road traffic accidents are also predictable hence preventable to a certain extent. The present study aims to ascertain the incidence of fatal vehicular accidents and patterns of injuries with emphasis on traumatic brain injuries amongst RTA victims brought to hospitals in rural Haryana. All the deaths due to road traffic accidents occurred in these hospitals during the period 2006-2010 were retrospectively analyzed. Out of 1458 medico-legal autopsies conducted, 536 (36.7%) were of vehicular accident fatalities. Majority of male victims (53.9%) were found in the age group of > 10-40 years (P < 0.05). A large proportion of the victims (33.79%) died on the spot/ brought dead or died within 1 hour of the accident. Head injuries were more frequent among motorcyclists (39.6%). Very high morbidity at place of accident or at initial phase of treatment is definitely alarming and highlights the need for taking urgent steps for establishing good pre-hospital care and provision of trauma services at site in India.

Key Words: Road Accidents, Fatal, Rural, Head Injuries, Morbidity, Medico-legal autopsies

Introduction:

Road traffic injuries are as a result of "accidents or random events" does not hold good any more as evidence from research shows that like all injuries Road traffic injuries are partially predictable and hence preventable.

Road Traffic Accidents (RTAs) have emerged as a major global public health problem of this century and are now recognized as "veritable neglected pandemic". [1]

The problem is so severe that, by 2020, it is projected that road traffic disability-adjusted life years (DALYs) lost will move from being the 9th leading cause of disability-adjusted life years lost to the 3rd leading cause in the world and will be 2nd leading cause in developing countries. [2] RTAs kill an estimated 1.3 million people and injure 50 million people per year globally.The magnitude of RTA and fatalities in India are alarming.

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*Resident, Dept. of Forensic Medicine and Toxicology Maharishi Markandeshwar Institute of Medical Sciences & Research, Mullana- Ambala E-mail: rajeshdd86@gmail.com **Professor, ***Resident, Dept. of Community Medicine ***Resident, **Prof. &Head ****Assoc. Prof. DOR: 16.03.12 DOA: 09.07.12 In 2009, 4.22 lakhs RTAs and 1.27 lakhs road traffic fatalities were reported. These numbers translate into one RTA every minute and one road accident death every four minutes. However, this is an underestimate, as not all injuries are reported to the police. [3] This indicates that the surveillance system for vehicular accidents is not well established in India.

The present study was therefore conducted to ascertain the incidence of fatal vehicular accidents and patterns of injuries with emphasis on traumatic brain injuries amongst RTA victims brought to hospitals in rural Haryana. Detailed analysis of the pattern and incidence of various injuries sustained by RTA victims will be carried out. Besides, features pertaining to hosts (road users), day wise pattern of accidents, severity of injuries, duration of survival of victims, types of skull fractures sustained, types of Intracranial haemorrhage involved etc will be studied in detail.

Materials and Methods:

The present cross sectional study was carried out among RTA victims admitted to various hospitals in Ambala. All the deaths due to RTAs occurred in these hospitals during the period 2006-2010 were retrospectively analyzed.

The detailed analysis of these cases was based on the inquest report, medical records and evaluation of autopsy reports. For the purpose of study, a RTA was defined as any vehicular accident occurring on a public road or highway and includes vehicle accidents where the place of occurrence is unspecified.

A detailed proforma for the purpose of recording socio-demographic profile of victims, epidemiological data, pattern and severity of injuries sustained, pattern of skull fracture and cranial trauma and other relevant data etc was prepared for the purpose of filling observations of the present study. The collected data were analyzed by SPSS version 11.5. Interpretation of the collected data was done by using appropriate statistical methods.

Results:

Out of 1458 medico-legal autopsies conducted during the study period, 536 (36.7%) were of vehicular accident fatalities. Males comprised 88.22% of the total fatalities, while females accounted for 11.77%. (Fig.1)

Maximum number of fatal vehicular accidents was reported on Saturdays followed by Fridays and Sundays. (Fig. 2) The majority of male victims were found in the age group (> 10-40 years) with a percent of 53.9% while it was 66.4% for female victims of the same age group which is statistically significant (P < 0.05). The lowest percentage of both male and female victims was in the age group (<10 years), which is statistically non significant. (Table 1)

A large proportion of the victims (33.79%) died on the spot/ brought dead or died within 1 hour of the accident. Forty eight cases survived up to 7 days & 38 cases (7.1%) survived beyond 1 week. (Fig. 3)

Head injuries were more frequent in motorcyclists than other victims, which was 39.6% versus 37.8% in drivers, 33.1% in passengers and 20.2% in pedestrians. Chest injuries (haemothorax, lung collapse etc.) were more frequent in motorcyclists than other victims, which was 8.1% versus 4.4% in drivers, 7.6% in passengers and 5.8% in pedestrians. (Table 2) Out of total 366 cases (68.2%) who sustained head injury, 31.3 % sustained head injury without any significant injury to other parts of the body. Skull fractures were found in 69.63% cases of head injury. The most common bone involved was the temporal bone 251 (48.8 %), followed by parietal bone (44.9 %), occipital bone (42.1%) and frontal bone (33.0%).

The commonest variety of intracranial haemorrhage was subdural haemorrhage (n=478, 89.2 %) followed by Subarachnoid haemorrhage (n=385, 71.8 %). (Table 3)

Discussion:

In our present study total vehicular accident fatalities comprised 536 (36.7 %) out of total 1458 medico-legal cases autopsied during

five years (2006 to 2010). For last four years the percentage of vehicular accident fatalities has remained almost constant.

Not surprisingly our study shows the overwhelming majority of the deceased (88.2%) were males. It is due to greater male exposure on urban streets and similar higher incidence of traffic accidents among males has been found by many other researchers. [4-10]

In the present study, the higher number of reported accident cases occurred on weekends (Fridays, Saturdays and Sundays) when compared to week days. Others also have observed similar results. [11, 12] In another study from Delhi, the highest number of RTAs was observed on Mondays and Wednesdays. This is in contrast to the study by Abhishek Singh who reported higher number of accident cases on week days. [13]

The present study revealed that, majority of the RTA victims was in the age group of 10 to 40 years (56.90%). Tendency of this age group to show scarce attention to traffic rules & regulations and non use of safety devices like helmets, seatbelts, restraints etc can be a possible explanation for the same. In a hospital based study by Ganveer GB majority of the victims were in the age group 18-37 years. [14] This shows that the people of the most active and productive age group are involved in RTAs, which adds a serious economic loss to the community. Similar observations were also made by Balogun JA. [15]

Regarding victims status the present study showed that more than half of RTA victims were pedestrians (57.9%), followed by vehicle passengers (32.8%), vehicle drivers (6.5%) and motor cyclists (2.8%). This can be explained as buses and minibuses are the main way of transport in our country. So in one crash, there are many of passengers. This comes in agreement with Anne et al. [16] who concluded that the nature of vehicles involved in traffic crashes is different in high income countries in which the privately owned cars are involved predominantly in RTA.

While in developing countries, buses, minibuses and trucks are frequently involved in crashes with several people (passengers) killed or injured in a single crash. As regards the injuries pattern, musculoskeletal injuries topped the list of injuries of RTA in all groups of victims. While, the percentage of head (39.6%) and chest (8.1%) in motor cyclists were more frequent than other victims due to severe trauma to unprotected bodies. These results are cohort with others. [17, 18] The presence of significant multiple injuries in the pedestrians of the present study can be explained by imagining the scenario of crashes between the body of pedestrians victims and the vehicle; first limbs and pelvis fractures are so frequent due to direct collision between vehicle and pedestrians body, second the victim is thrown in the air to the ground leading to subsequent more injury where any part of the body liable to be injured, third the wheel of the vehicle can pass on the victims adding more injuries (limb amputation etc). So in pedestrians multiple injuries are the rule. This comes in agreement with Al Madani and Al Janahi. [19]

Most of the deceased suffered from multiple skull bone fractures. The most frequent bone fractured was temporal bone (n=251, 48.8%), followed by occipital bone (n=226, 42.1%). The results are identical to study conducted by AIIMS, New Delhi. [20]

The probable reason of multiple skull bone fractures is very high speed at which vehicles move on highways. So accidents which occur at high speeds cause a great impact on head when it strikes by forcible contact with a broad resisting surface. When frequencies of compartment hemorrhages sinale were our study revealed compared, subdural hemorrhade as the frequent group followed by subarachnoid hemorrhage. Similar results were obtained by others. [21, 22]

Conclusion:

This study shows that most of the deaths in RTA take place either on the spot or within 24 hours of injury which is very alarming and highlights the need for taking urgent steps for establishing good pre-hospital care and provision of trauma services at site in India. Our study also shows that head injuries remain the most common and serious type of trauma and availability of good neurosurgical care is essential for these patients.

A nationwide computerized trauma registry is urgent requirement to bring out the risk factors, circumstances, chain of events leading to the accidents and will be extremely helpful in policy making and health management at the national level in India.

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Fig. 1: Total Medico- Legal Cases Autopsied (Blue Bar) &Fatal Vehicular Accidents (Red Bar)



Fig. 2: Incidence of Fatal Vehicular Accidents by Days



Fig. 3: Duration of Survival of Victims



 Table 1

 Distribution of Subjects according to Age and Sex

| Sex | Male | | Female | | Total | | X ² | Р |
|-----------|------|------|--------|------|-------|------|----------------|-------|
| Age (yrs) | N. | % | Ν. | | | % | | |
| < 10 | 28 | 6.8 | 7 | 0.3 | 0.28 | 6.5 | 0.3 | 0.28 |
| > 10-40 | 220 | 53.9 | 85 | 6.1 | 0.006 | 56.9 | 6.1 | 0.006 |
| > 40-60 | 108 | 26.5 | 19 | 7.2 | 0.003 | 23.7 | 7.2 | 0.003 |
| > 60 | 52 | 12.8 | 17 | 0.02 | 0.43 | 12.9 | 0.02 | 0.43 |

P > 0.05: Non significant, P < 0.05: Significant, P < 0.0001: Highly significant

| | | l able 2 | | | |
|---------------|-------------------|-------------------|------------------|------------------|--|
| Pattern of Va | arious Injuries S | ustained in Fatal | Vehicular Accide | ents (2006-2010) | |

| Victim status | Pedestrians N= 173 | | Passengers N= 157 | | Drivers N= 45 | | Motorcyclis | ts N= 149 |
|-----------------------------------|--------------------|------|-------------------|------|---------------|------|-------------|-----------|
| Injured system | Ν | % | Ν | % | Ν | % | N | % |
| Head injuries | 35 | 20.2 | 52 | 33.1 | 17 | 37.8 | 56 | 39.6 |
| Chest injuries | 10 | 5.8 | 12 | 7.6 | 2 | 4.4 | 12 | 8.1 |
| Abdominal injuries | 3 | 1.7 | 7 | 4.4 | 2 | 4.4 | 3 | 2.0 |
| Musculoskeletal systems | | | | | | | | |
| Fracture (excluding rib fracture) | 101 | 58.4 | 67 | 42.8 | 15 | 33.3 | 25 | 16.7 |
| Several tendon injuries | 8 | 4.6 | 3 | 1.9 | 5 | 11.2 | 12 | 8.1 |
| Lacerated wound | 14 | 8.1 | 16 | 10.2 | 4 | 8.9 | 41 | 25.5 |
| Limb amputation | 2 | 1.2 | • | - | - | - | - | • |

Table 3

Incidence and Pattern of Different type of Injuries in Fatal Vehicular Accidents (2006-2010)

| Death due to injury in fatal vehicular accidents | | | | | | | |
|--|----------------------------|------------|--|--|--|--|--|
| Injury | Frequency | Percentage | | | | | |
| Head alone | 168 | 31.3 | | | | | |
| Head + other | 198 | 36.9 | | | | | |
| Other | 170 | 31.8 | | | | | |
| Pattern of different type of skull fractures* | | | | | | | |
| Fracture | Frequency | Percentage | | | | | |
| Bone involved | | | | | | | |
| Temporal | 251 | 46.8 | | | | | |
| Parietal | 241 | 44.9 | | | | | |
| Occipital | 226 | 42.1 | | | | | |
| Frontal | 177 | 33.0 | | | | | |
| Sphenoid | 82 | 15.3 | | | | | |
| Base of skull | 65 | 12.1 | | | | | |
| | Pattern of cranial trauma* | | | | | | |
| Injury | Frequency | Percentage | | | | | |
| Intracranial haemorrhage | | | | | | | |
| Subdural | 478 | 89.2 | | | | | |
| Subarachnoid | 385 | 71.8 | | | | | |
| Intra-cerebral | 83 | 15.5 | | | | | |
| Extradural | 102 | 19.0 | | | | | |
| Brain laceration | 87 | 16.2 | | | | | |
| Multiple responses* | | | | | | | |

Original Research Paper

Knowledge and Familiarity with Basic Life Support Among Medical Students

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Abstract

Accidents and cardiac arrests are the common emergencies with grave consequences and high mortality rate which can be prevented by simple maneuvers like basic life support (BLS). The objective of present study was to assess the knowledge of involved skills and familiarity with BLS among medical students. A questionnaire base study of 180 students was done regarding awareness and skills involved and opinion regarding its inclusion in the undergraduate curriculum. A total of 172 students finally participated in the study. 54% were females and the mean age was 22 yrs. A significant no of students were aware of general idea of BLS. 63.37% knows the requirements of BLS, 88.95% knows about the importance of BLS, but large numbers of students were not very conversant with the skills. They were of the opinion that the course be included in undergraduate medical curriculum. Lack of awareness regarding BLS among medical students is important issue that needs to be addressed promptly. These courses should be part of under graduate medical curriculum

Key Words: Medical Students, Basic Life Support, Medical Curriculum (BLS), Knowledge

Introduction:

Accidents and cardiac arrests are the most common emergencies with grave consequences and the high mortality associated with them can be easily prevented most of the times by some very simple maneuvers and skills. Knowledge of BLS as an immediate intervention is an efficient strategy which favourably influences the course of sudden cardiac arrest BLS includes recognition of signs of Sudden Cardiac Arrest (SCA), heart attack, cardiovascular stroke, foreign body and Automated External Defibrillator (AED). [1]

Resuscitation "Is the art of restoring life or consciousness of one apparently dead. [2] Early records from Egyptian mythology and the Bible suggest the mouth to mouth and mouth to nose respiration were among the earliest resuscitative effort using artificial using artificial respiration. [3, 4]

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*Assistant Professor, Dept. of Anaesthesiology Government Medical College, Haldwani (Nainital) E-mail: ajayksinha@yahoo.com ** Assoc. Prof, Dept. of Anaesthesiology *Assist. Prof, Dept. of Pharmacology **Assoc. Prof, Dept. of Pharmacology *Assist. Prof, Dept. of T.B. & Chest ***Prof. & Head, Dept. of FMT DOR: 16.3.12 DOA: 08.07.12 Over time resuscitative skills have evolved into a proper protocol which involves cardiopulmonary resuscitation (CPR) commonly known as BLS.

However BLS includes techniques other than CPR but these two are used interchangeably. Little information has been published on the level of knowledge in emergency medicine among medical students. Logically, medical students as future health care professionals constitute a group of professionals that should be highly knowledgeable in the area of immediate treatment for serious acute condition. Improvement in understanding of BLS principles among medical students may be an appropriate health policy strategy to increase the limited pool of BLS provides.

Since atherosclerotic heart disease is the overall leading cause of death and trauma is the leading cause of death among those aged 1-44 years it in crucial that such affords be maintained. [5] BLS requires nothing as far as the resources are concerned and its importance is undeniable. New Interns are expected to take part in resuscitation from their first day. [6] In India very little data is available which addresses the awareness of the medical personnel including students.

Improvement in understanding of BLS principles among medical students may be an appropriate health policy strategy to increase the limited pool of BLS provides. The objective of the present study was to assess knowledge of involved skill and familiarity with BLS among medical students.

Materials and Methods:

A cross sectional study was conducted at GMC Haldwani Nainital among medical students through an anonymous questionnaire survey regarding awareness and skills involved in BLS and opinion regarding its inclusion in the undergraduate medical curriculum.

Each student was briefed on the objective of the study and verbal consent was obtained from the study subject. The questionnaire consisted of questions regarding abbreviation of BLS the process and its requirements, appropriate person to know it and knowhow of the maneuver. It had queries regarding familiarity with the involved skills and questioned the students regarding inclusion of BLS in the undergraduate curriculum. A total sample of 180 students was distributed questionnaires and asked to fill up without interpersonal consultation. After excluding the filled incomplete questionnaires 172 questionnaires were assessed. The result was analysed by SPSS version 11.0 statistacally.

Results:

A total of 172 medical students finally participated in the study. The mean age was 22 yrs (20 to 26). (Fig.1 & 2) A significant number of students were aware of the general idea of BLS. Large number of respondents knew about the meaning of (76.74%) requirements of BLS (63.37%) and importance (88.95%). (p<0.001)

It was observed that 13.37% of students did not know about the person who requires BLS. On the contrary a large number of students responded incorrectly to the question on the skills involved in BLS (CPR). (Table 2)

Out of total cases, 69.77% of the students did not know how to assess the responsiveness during Basic Life Support procedure Equal no of students were unaware of the ways to check airway breathing and circulation Significant member of students about gave incorrect answer about the location of chest compression (73.26%), rate of chest compression and (76.74%) and depth of chest compression (82.56%). (Table3) About 52.33% had heard about the BLS course although it has attended by very few 4.07% Majority insisted that it be included in the undergraduate medical curriculum 93.02%. (Table 4)

Discussion:

Our study shows that medical students lacked cognitive awareness of the BLS.

Awareness was found in significant students but the skills were found in only some students. Our study emphasizes the cognitive approach to the general perception and skills of BLS. Practical applications are very difficult to assess through an questionnaire as cognitive abilities of a person may be better than technical skills he has. A rather mediocre knowledge level of BLS in medical students indicates a deficiency of awareness and education. Other authors have found similar lack of ability in medical graduates. [7-9] In a Japanese study, the authors reported that 84% of students were unable to perform resuscitation according to guidelines. [10]

One study found that there is wide disparity between students estimation of their own knowledge and skills in BLS and their actual knowledge may be due to several causes like not enough time spent on acquiring theoretical and practical skills involved in BLS during the MBBS [11] or may be lack of training imparted by the college due to it not being part of compulsory training included in medical under graduate curriculum. Asmita et al have shown that there was marked improvement in the mean scoring of participants after training for BLS as compared to the scoring before training. [12]

A large number of participants (93.02%) were of opinion that training of BLS should be part of the undergraduate curriculum. Hassan Zaheer et al [13] concluded that inclusion of BLS course will increase awareness and application of this valuable life saving maneuver. Therefore BLS training should be mandatory for all medical and paramedical courses. Graham et al [14] studied a survey of undergraduate training in UK medical schools and found similar results. Asad abbas et al showed that knowledge of trained students was found to be better than untrained student. [15] It is also a fact that even after graduation, training in resuscitative skills is inadequate and difficult. Busy residency schedules and lack of resources act as barrier.

In spite of all difficulties doctors have to learn resuscitative skills in the clinical setting. Studies have shown that junior doctors are not competent in carrying out effective cardiopulmonary resuscitation [16, 17]; perhaps training in advanced life support should become mandatory component of all medical school undergraduate curriculums. [6] The successful completion of BLS and other advanced courses the students can use the skill in resuscitating the traumatized patient. [18]

Conclusion:

Therefore we conclude that lack of awareness regarding BLS among medical

students is important issue that needs to be addressed promptly. These courses should be part of under graduate medical curriculum. A formal BLS training is essential to maintain competency in the technique.

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Table 4: Basic Life Support Course (n = 172)

| Questions asked | Yes | No |
|---|--------|--------|
| Heard about the course | 52.33% | 47.67% |
| Attended the course | 4.07% | 95.93% |
| Course to be included in undergraduate Medical curriculum | 93.02% | 6.98% |

Table 2: Awareness of Basic Life Support n=172

| Questions Asked | Correct Answer | Incorrect Answer |
|----------------------------|----------------|------------------|
| Abbreviation of BLS | 76.74% | 23.26% |
| Requirements of BLS | 63.37% | 36.63% |
| Person who requires BLS | 86.63% | 13.37% |
| Importance of BLS | 88.95% | 11.05% |

| Questions asked | Correct | Incorrect |
|--------------------------------|---------|-----------|
| | Answer | Answer |
| Assessment of responsiveness | 30.23% | 69.77% |
| Airway checked by | 50.00% | 50.00% |
| Breathing checked by | 47.67% | 52.33% |
| Circulation checked by | 49.42% | 50.58% |
| Location for chest compression | 26.74% | 73.26% |
| Rate of chest Compression | 23.26% | 76.74% |
| Depth of Chest compression | 17.44% | 82.56% |

* p<0.001 compared to correct answer

Fig. 1: Sex Ratio







Original Research Paper

Psychopathologies in Finished Homicide: A Serial Study

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Abstract

It is very evident that most of homicide and suicide have own underlying psychopathologies. The suicide is a social and auto framed event performed by patient under distressful condition with unintention to harm other. Homicidal in mental illness is unintentional behaviour performed by offender under influence of underlying psychopathologies especially command hallucination in 1 out of 10, (10%) delusional reference in 3 out of 10 (30%), delusional misinterpretation in 1 out of10 (10%) delusion of impost ring in 2 out of 10 (20%) and almost major psychotics had delusion of persecution 6 out of 10 (60%) Studied sample had own choice of weapons which depends on experience of weapon used and availability of weapon at the time of act performed act. All required more than 10 days of observation instead of minimum 10 days as mentioned in the Mental Health Act, 1987.

Key Words: Homicide, Delusion of Persecution, Impost Ring, Reference, Mental Health Act

Introduction:

It is very evident that most of homicide suicide have own underlvina and psychopathologies. The suicide is a social and auto framed event performed by patient under distressful condition with un-intention to harm other. Reverse is also true for homicide which comes with features of heighten energy, focused attention, impulsivity, biased opinion to other and has personal interest of offender. Most of the homicides have own kind of motivation. In mentally ill offender nature of act is not known to the patient may have bias opinion against the victim. misperception, delusional misinterpretation, command and control by other (invisible) etc. The legal interest to consider these things which can be applicable to Indian lunacy act is a matter of question that has to be answered in court of law. Epidemiological studies conducted by [9] published first study.

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They interviewed more than 1000 scientifically sampled three people at metropolitan area provided later on mental disorder in self reported past year. 20% person had affective or schizophrenic disorder reported having been violent as compare with 2% of person with no mental disorder. 35% of alcohol abuser and 35% of other substance abuser also had reported violent behaviour. Link. Cullen and Andrew commented also on specific psychopathologies in individual who reported violence also had active delusional believes.

The patient is known case of schizophrenia since 1992. In later study [10] focused on significance of delusion even more sharply they found that delusion of threat as occur for example in paranoid schizophrenia or delusional disorder : delusion of control , thought insertion or belief that someone is controlling his thought were associated with violence, but other delusion were not. Link cautioned that contribution of mental disorder to total amount of community violence is trivial. Age, sex, gender and education were also more strongly associated with violence than with mental disorder. Only 3% of violence is contributed by person with mental illness [1] a study was conducted on psychopathologies and weapon choice at department of criminology and forensic psychiatry of university of BARI in Southern Italy on 103 perpetrators. The result showed a significant correlation between some types of mental disorder and weapon choice. A strong correlation was found between delusional disorders and the use of sharp instrument;

whereas depressive disorders were associated with asphyxia. Organic disorder was highly correlated with the use of blunt instrument. In cases where the homicide was the result of impulsive reaction sharp weapon was found as choice. [2] Homicide suicide is least prevalent worldwide. Annual incidence of homicide suicide ranged from 0.3 to 0.7 per 100000 for person under age of 55 and 0.4 to 0.9 per 100000for persons age 55 and older. [3]

One of the interesting case study focus on impact of daily living psychology case point is jean striven Harris had been overlooked the effect of seeing film Gilda and obsessively recalling the hit film song Put the blame mane. Harris recalled repeatedly as a secret weapon from the day she saw the film until the death of Tranower-a span of approximately 34 years. [4]

A review article on spousal murder suggests nine identified risk factors of homicide. It also reveals that rate of homicide is 3% of all women were murdered by the current or former intimate partner compared to 6% of men. The most common cause of an intimate partner's death in England and Wales was attacked by sharp instrument or being strangle, By contrast the most common cause in United State for spousal homicide is being shot. [5] A review of literature reveals relationship between autistic spectrum pathology and serial homicidal behaviour. [6] There are several examples of psychopathic sexual serial killers who have masochism, lust murder and necrophilia. The most controversial case was unsolved was Christopher in 1985. He was arrested in a murder case of serial killing. The controversy was arisen especially since likely killing in the series occurred while he was in jail. The autopsy determined official cause and manner of death was sexually assaulted and 47 stab wounds to her head and chest. [7]

Most of the time trial conducted on the behalf of honorable court to follow their guidelines of mental health act by putting them in under observation initially for 10 days observation, which can further extend the duration for 30 days or 90 days or so forth (section--) The method of evaluation totally depends on manual serial observation and serial MSE by skilled professionals and rate their severity on required tool and rating scales.

Aims and Objective:

To find out psychopathologies in those performed homicide undergone medical trial

Tools and Apparatus:

• MSE based on PSE 9 and PSE 10

- Diagnostic criteria of ICD 10 and DSM-IV used for diagnosis.
- Projective test and analysis to find psychotic features.

Procedure:

The patients whoever went under medical trial by order of honourable court are taken into consideration. These patients were admitted either in mental hospital ward or transferred into mentally ill prisoner ward at central jail Gwalior. Subjects were studied at different occasion from 2008 to 2011. The observation were completed as per rules of mental health act initially for 10 days later extended till completion of observation required by medical and mental health professional s and staff on duty. During these period patients were kept drug naïve and put in close observation for evaluation. Only limited use of a medicine was allowed especially that medicine which has no effect on mental status of the patient. During these procedure we followed and all ethical considerations.

Observations: Please refer to Table 1 Result:

The studied subjects has 10 patient samples whoever undergone through medical trial has age range of 20-82 years. Among this group 2 were females. The initial days of observation was 10 days but extended to 30 days or more in almost all the cases. The previous record and mental health status was not known to us. During the procedure at different section of time, the individual case was assessed and evaluated. One of the case studied aged 22 years remained mute and speech was inaudible. Most of the time (n=1/10; 10%) communication failure lengthen the duration of observation.

Speech- relevancy is found in initial setting in most of the cases 4/10 (40%) of all studied subjects. 1 of them showed initial relevant. On continuous talks, irrelevancy was noted or sometimes after speaking a few words normally returns to irrelevancy. (n=1/10=10%).

The psychopathologies noted on repeated MSE was AH mostly of voice of conversation of 4/5 to 5/5 severe to marked severe range in studied subjects in 4/10 (40%). One patient was already on treatment and unfortunately showed exacerbation at the time of event, later the symptoms were resolved on raising and revising of drugs. 3/10 still had doubtful conditions and continuous monitoring is required. Olfactory and tactile hallucinations are not seen in any patients among the studied groups. Visual hallucination was the second

commonest perceptual disturbance noted in 2 subjects n=2/10=20% Thought insertion in 1 of the studied was further produced information on queries made upon them. Thought withdrawal was clearly made in two subjects n=2/10=20%and remained questionable in 1 subject n=1/10=10%.

Delusion of persecution and reference was present in all diagnosed major psychotic patients n=5/10=50% and remained questionable in 2 subjects n=2/10=20%. Impost ring was noted in 2 subjects n=2/10=20%. Memory is clear and definable in n=5/10=50%and impaired in n=4/10=40% and questionable in n=1/10=10%. Judgment skill and illogical thinking was found impaired in those who had perceptual disturbances and formal thought disturbance.

Retrospective analysis showed variation in each individual studied. The analysis reveals-**Case 1:** had delusion of reference persecution and impost ring and perceptual disturbances.

Case 2: showed no hallucination and any other gross abnormalities

Case 3: showed delusional reference and misinterpretation, thought insertion and perceptual disturbances.

Case 4: showed marked aggression and agitation and unable to define the act but had no gross thought and perceptual disturbances.

Case 5: marked aggression and unable to understand the nature of the act due to perceptual and thought disturbances.

Case 6: command hallucinations, delusion of impost ring and other forms of delusions and perceptual disturbance were noted in gross severity.

Case 7: no communication was made in that period, observation was likely to extend

Case 8: patient denied to perform on studied tools and showed inability to understand the fact was still in under observation.

Case 9: impulsivity and aggression made the act and patient is known case of chronic schizophrenia U D TYPE with limited capacity to comprehend detained from long time showed acute exacerbation and inappropriate affect.

Case 10: describe differently at different section of time may have BPD/ hypomania but not extent up to clearly defined major psychotic disorder. Activity on observation found normal during such period

Discussion:

The sample studied selected those who were trial only one had homicide with content of commands. The studied individual psychopathologies in the categories of patients who have major psychotic disorders like schizophrenia almost all had auditory. The act that was performed by them had active psychopathologies such as delusion of impost ring and delusional reference in case 1. They had command hallucinations, delusion of impost ring and reference in case 5. Case 3 had delusional reference and misinterpretation.

About 3/10 had delusional reference, 20% had delusional impost ring in any form such as duplicate/replacement and misinterpretation in 20% of the subjects. The impulsivity, aggression and agitation has made violence was noted separated even when those have/have not psychotic features. Without psychotic features was found in 3/10 (30%) patients.

We studied these features as bias opinion, delusional belief, delusion of control and thought insertion or belief that someone is controlling his thought was associated with violence but other delusion was not. Age, sex and gender was strongly associated with violence in mental disorder. In this study, these factors have influence but considered independent due to small sample size. [1]

The choice of weapon in case 1 & 3 was gunshot n=2/10=20%. Case 6 had stab injury n=1/10=10%. Case 8 has sharp instrument, total n=2/10=20%. Rest had blunt instrument like pebble, rods etc n=6/10=60%. Among them one subject had psychotic illness like schizophrenia and was treated in IPD. Sharp instrument was used in delusional disorder, depressive uses asphyxia, organic disorder used blunt instrument and aggressive reaction used sharp instrument in study done by Catanexsi R et al 2011/2009 whereas in this study small sample does not reveal selection of a particular instrument since 2 of the subjects had used gunshot. 1 of them is a female selected sharp instrument and thrusting as a way to perform homicide. Impulsive and psychotic used blunt instrument in 6/10 (60%), that indicated selection of instrument remains optional and availability at the scene of the crime and local vicinity.

Among studied subjects who were in medical trial, major psychotic disorder sub type paranoid schizophrenia n = 4/10 = 40% and one has chronic schizophrenia U D type on acute exacerbation total n = 5/10=50%. 3 cases had not psychotic disorder but due to some of queries of underlying psychiatric illness had to be ruled out n=3/10=30%. Two cases still remained in under observation n=2/10=20%. None of them showed homicide suicide performed or unperformed thought in our study Cohen D et al. [3] Almost all required vigorous observation, interpretation and evaluation of

their claimed behavior which was not completed in 10 days, required to prolong the duration of observation in spite of fixed initial shortest period of medical trial of mental illness is going to be reduced 10 to 7 days in newer draft of Mental health Act. [8, 9]

Conclusion:

The conventional thought of command hallucination is not only identified serious problem associated with homicidal behavior but it is also influenced and determined by delusion reference misinterpretation and impost ring and act performed by impulsive behavior marked aggression and agitation. The choice of depends instrument/weapons on previous experience of use of instrument and instrument available in immediate vicinity. Homicide suicide may be normal phenomena related to sine and auilt feeling of sound full mind but not evident feature of psychotic illness.

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| Table 1 | | | | | | | | | | |
|----------------------------|---|--------------------|--------------------|--------------------|--------------------|--------------------|---|---------------------------------|-----------------------|-------------------|
| S. No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Age | 48 | 24 | 50 | 58 | 82 | 48 | 22 | 52 | 36 | 20 |
| Sex | Male | Male | Male | Male | Male | Female | Female | Male | Male | Male |
| Duration | NK | NK | NK | NK | NK | NK | NK | NK | NK | NK |
| Conscious | + | + | + | + | + | + | + | + | + | + |
| Oriented | Oriented in TPP | Oriented in TPP | Oriented to TPP | Oriented in TPP | Oriented in TPP | Oriented in TPP | Oriented in TPP | Oriented and alert | Oriented and alert | Oriented alert |
| Speech& PD | | | | | | | | | | |
| Comprehensible | + | + | + | + | + | + | Incomprehensi ble and inaudible most of the time | Stuttering and hesitation | Incompre hensible | + |
| Relevance | Relevan t- irrelevan t,mixed delusion | + | Irreleva nt | + | Irreleva nt | Irrelevant | - | + | Irrelevant | Irrelevant |
| Ah | VC +++ | - | VC ++++ | - | VC++++ | VC+++++ | ? | ? | ? | - |
| Th | - | - | - | - | - | - | ? | - | - | - |
| Gh | - | - | - | - | - | - | ? | - | - | - |
| Vh | - | - | - | - | +? | ++ | ? | ? | ? | - |
| Thought disorders | | | | | | | | | | |
| Th Insertion | - | - | + | - | - | - | - | - | - | - |
| Tw | - | - | - | - | + | + | ? | - | - | - |
| DP | + | - | + | - | + | + | ? | - | ? | - |
| DR | + | - | + | - | + | + | ? | - | ? | - |
| D of impost ring Memory | ++ | - | - | - | - | - | ? | - | - | - |
| Intact | + | + | - | + | - | - | ? | + | - | + Conf. |
| Impaired | - | - | + | - | + | - | ? | - | + | - |
| Judgement | - | + | - | + | - | - | ? | ? | - | - |
| Mood | Flat | Low | Flat | Blunt | Blunt | Blunt | ? | Euthymic | Blunt | Euphoric |
| Affect | Inappro priate | Appropri ate | Inappro priate | Inappro priate | Inappro priate | Inappropri ate | ? | normal | Inappropri ate | Appropriate |
| Illogical thinking | +++ | - | ++ | - | ++ | +++ | ? | - | + | +? |
| Magical thinking | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | + Eantacy |

TH W = THOUGHT WITHDRAWAL, TH INSERTION =THOUGHT INSERTION, DP = DELUSION OF PERSECUTION, DR = DELUSION OF REFERENCE, DI = DELUSION OF IMPOSTRING, AH = AUDITORY HALLUCINATION, VH = VISUAL HALLUCINATION, GH = GUSTATORY HALLUCINATION, OH = OLFACTORY HALLUCINATION, TH – TACTILE HALLUCINATION, Not Known=NK, Perceptual disturbance=PD

Original Research Paper

Nosocomial Infections: Management Guidelines

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Abstract

Hospital infection or Nosocomial infections are commonly transmitted by medical staff negligence, unhygienic medical interventions and weakened immune systems. Since medical staff moves from patient to patient, the staff themselves serves as a means for spreading pathogens. In India Hospital infection estimates vary from 10 to 30 percent, the least being about 3 percent in the best of hospitals.

Present study is conducted in Sharda hospital, Greater Noida from Jan. 2011 to till Dec. 2011 on 290 patients admitted in hospital for more than 48 hours. These patients were admitted in various departments for different medical interventional procedures. It is assumed in this study that bacteria having in common sensitivity pattern are of same origin and strain were considered of hospital origin. The sample selected for study was body fluids and the bacterial isolates grown on culture were identified by standard microbiological techniques. Total 15(5.15%.) patients had developed nosocomial infection after 48 hours of stay in hospital and *Escherichia coli* is the main bacterial isolate. It is observed that sense of awareness and hand washing are important components for prevention of nosocomial infection.

Key Words: Nosocomial infection, Medical staff negligence, Escherichia coli

Introduction:

Hospital infection is also called nosocomial infection. It is the single largest factor that adversely affects both the patient and the hospital. The English word Nosocomial is derived from the Greek NOSOKOMEION meaning "hospital". Nosocomial infection is that which develops in the patients after more than 48 hours of hospitalization. Bacterial infections, which appear within first 48 hours of admission, are considered as community acquired.

Nosocomial infections are commonly transmitted when hospital officials do not practice correct hygiene regularly. Since medical staff moves from patient to patient, the staff themselves serves as a means for spreading pathogens. Sophisticated equipment which are not easy to clean, the advancing age of the patients, use and trial use of antibiotics resulting in drug resistance, higher rate of staff turnover, bringing patients together susceptible to some type of infection etc. are the common mode of transmission of nosocomial infection.

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In India Hospital infection rate is higher (10-30%) as compared to western countries (0.8-8%). Hospital infection occurs in every hospital; the difference is in the degree of the severity only. In the United States, the Centres for Disease Control and Prevention estimate that roughly 1.7 million hospital-associated infections, from all types of micro-organisms, includina bacteria. combined. cause or contribute to 99,000 deaths each year.[1] Nosocomial infections can cause severe pneumonia and infections of the urinary tract, bloodstream and other parts of the body. Many types are difficult to attack with antibiotics and antibiotic resistance is spreading to Gramnegative bacteria that can infect people outside the hospital. [1]

Most common pathogens are MRSA, and gram negative bacterias. Another growing pathogen is the drug-resistant Gram-negative (Klebsiella pneumoniae), especially prevalent in New York City hospitals. It is estimated that more than 20 percent of the Klebsiella infections are now resistant to virtually all modern antibiotics and these supergerms are now spreading worldwide".[1]

Material and Methods:

This study is a retrospective study conducted in Sharda hospital, Greater Noida from Jan 2011 to Dec.2011. It is assumed in this study that bacteria having in common sensitivity pattern are of same origin or strain were considered of hospital origin. It includes 290 patients admitted in hospital for more than 48 hours. These patients were either on ventilator, admitted for gynaecological, surgical & orthopaedic procedures. The sample selected for study were body fluids which were cultured on blood agar and MacConkey's agar, the bacterial isolates grown on culture were identified by standard microbiological techniques.

Observation and Results:

Total 15 (5.15%) patients had developed infection after 48 hours of stay in hospital, among them 04,02,02,03,01,01,02 patients developed infection after staying in hospital for 03,04,09,05,27,11 and 07 days respectively. (Graph 1) highest isolation was in pus (7cases) and lowest in high vaginal swab, catheter tip and sputum with one case each. (Graph 2) Out of total 15 cases 10 were males and 05 were females. (Graph 3)

Graph 1: Bacterial Growth in Samples during Hospital Stay



Graph 2: Distribution of Cases in Various Samples



Graph 3: Distribution of Cases According to Sex



There were 09 patients were of Escherichia coli, 03 patients were of Klebsiella aerogenes and 01 patient of Pseudomonas aeruginosa. (Table 1) 06 (66.6%) were of E.coli and 03 of Klebsiella aerogenes was having sensitivity in common.

| Table | 1: | Bacteriological | Profile | of |
|--------|---------|-----------------|---------|----|
| Nosoco | omial I | nfections | | |

| Bacteriological Profile | N=15 |
|-------------------------|------------|
| Escherichia coli. | 09(60%) |
| Klebsiella aerogenes | 05(33.33%) |
| Psedomonas aeuginosa | 01(6.66%) |
| | |

Discussion:

Any hospital can be expected to record a 5-10 per cent incidence of hospital acquired infections where as in Sharda hospital the nosocomial infection rate was 5.15% with an active infection control programme because of today's aggressive approach to sick patients

Prevention of hospital infections is essentially a big policing operation, for this every hospital has to constitute the infection control committee. [2] The core committee consists of a physician, a microbiologist and a surgeon, infection control sister, with representatives from operation theatres, CSSD and ICUs.

Inputs are also required at times from others in housekeeping, laundry, food services and engineering who work as a team to maintain the hygiene and cleanliness of any institution. Usually the infection control sister is the main active member in reporting & control of infection. [3] Finally the committee requires its recommendations to be implemented and so it must have access to administrative heads of the institution.

Functions of the Committee:

The committee performs three principal functions.

 The first is to collect the data of micro flora of its high risk areas such as operating theatres, adult and neonatal ICUs, dialysis units and oncology services.

A good microbiology laboratory has to isolate organisms, to plot antibiotic resistance patterns and to indicate to clinicians trends and changes in hospital flora.[4] The laboratory is also best suited to identify outbreaks (3 or more cases of infection with the same organism and antibiogram) and to alert clinicians accordingly.

- The second function is to carry out surveillance of infections [5] that
- a. Are associated with a high level of morbidity;
- b. Post cardiac surgery wound infections;
- c. infections due to antibiotic resistant bacteria;
- d. Vascular access related infections which are potentially preventable.[6]

Surveillance is the first step in detection of breakdowns in aseptic practices and sudden increases in infection rates so that remedial steps can immediately be taken. [7] Surveillance is a powerful tool in infection control but is time consuming and expensive. Spot surveillance is a quicker and cheaper approach [8, 9]

• The third function of the committee is to enforce good infection control practices. For this certain concepts must be ingrained.[10]

Nosocomial pathogens have reservoirs and are transmitted by predictable routes to susceptible hosts. Thus hospital tap water in India may be contaminated with *E coli* or *Legionella* and cause infections. Operating theatre air must be kept pathogen free with the aid of air changes per hour and the use of bacterial filters. [11]

Sometimes members of the operating team are chronic shedders of staphylococci either from the nose or perineum, who because of their proximity to the surgical site can initiate wound infection. In the wards and ICUs cross infection is a bigger threat. Transfer of organisms through the hands of health care workers from one patient to another makes hand washing the single most important infection control practice. Hospital infections are increased by invasive devices and there must be a conscious effort to remove these at the earliest opportunity. Bacteraemias, pneumonias, urinary tract infections, intravenous line infections and surgical site infections are the major causes of morbidity and mortality.

Effective Control Measures:

- 1. Wearing an apron during patient care reduces the risk of infection. The apron should either be disposable or be used only when caring for a specific patient
- 2. Hand washing frequently is called the single most important measure to reduce the risks of transmitting skin micro-organisms from one person to another.

Washing hands as promptly and thoroughly between patient contacts and after contact with blood, body fluids, secretions, equipment excretions. and or articles them is contaminated by an important component of infection control and isolation precautions. All visitors must follow the same procedures. as hospital staff. Wearing gloves play an important role in reducing the risks of transmission of micro-organisms as it provide a prevent protective barrier and aross contamination of the hands while touching blood, body fluids, secretions, excretions, mucous membranes, and non intact skin.

- 3. Aseptic techniques
- 4. Segregation of contaminated materials and instruments.
- 5. Sanitizing surfaces is an often overlooked, yet crucial component of breaking the cycle of infection in health care environments.
- 6. Sterilization practices include effective OT sterilisation, cleaning of Air conditioners.
- 7. Use of antibiotics must be monitored and controlled. The major problem is involvement of organisms showing multi-drug resistance.

The most effective technique of controlling nosocomial infection is to strategically implement Quality control measures to the health care sectors. An evidence-based management can be a feasible approach. For the diseases like ventilator-associated pneumonia and hospital-acquired pneumonia, controlling and monitoring hospital indoor air quality needs to be on agenda in management. [12]

Conclusion:

Though hand washing, wearing aprons and other aseptic measures, Occupational Safety and Health Administration are important measures to control the nosocomial infection, but developing sense of awareness for these measures in medical staffs as well as in public are a big task. For this regular screening for pathogens, training and teaching programme on hospital infection control measures of medical staff are recommended.

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Review Research Paper

A Review of Health Risks and Medico-Legal Issues Related to Human Trafficking

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Abstract

Human beings are trafficked within the country or across international borders mainly for the purpose of bodily exploitation or slavery. The victims of trafficking remain vulnerable to various adverse situations such as involvement in sex industry, employment in hazardous employment, unhygienic living conditions, and poor nutrition affecting not only to their physical health in form of disease or injuries, but also the mental health. Poor access to health care facilities also adds to their tragic condition. Many countries have constitutional and legal provisions to deal with the issues of trafficking, therefore whenever the victims of trafficking are rescued they are subjected to medical examination for protection of health, management of disease or injuries, documentation, collection of biological or trace evidences of legal importance and also provided with psychiatric support and access to agencies involved in rehabilitation of such victims. In this article we present a review of health risk and medico-legal issues related to human trafficking along with magnitude of problem and various legislative and constitutional provisions in India.

Key Words: Trafficking, Health, Medico-legal, Health, Management, Disease, Injuries, Trace Evidence

Introduction:

Trafficked persons are defined as "Individuals who are coerced, tricked or forced into situations in which their bodies or labour are exploited, which may occur across international borders or within their own country". [1] Exploitation includes prostitution or other forms of sexual exploitation, forced labour or services, slavery or similar practices, servitude or the removal of organs. [2]

Human trafficking is a group of crimes with exploitation of men, women and children for financial gains and is violation of fundamental human rights. It is not only an international crime but also a lucrative trade that generates annual profit. Victims are lured or abducted from their homes and subsequently forced to work against their wishes in various establishments, indulge in prostitution or subjected to various types of indignitiesand even killed or incapacitated for the purposes of begging and trade in human organs.

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International Scenario of Trafficking:

Trafficking across the international borders is mainly within the region. For example, South Asians are generally trafficked within South Asia [3] (e.g. Nepalese to India), Central Americans are often moved to another Latin American country (e.g., Dominicans to Argentina [4]), Eastern Europeans are trafficked either within central or eastern Europe (e.g., Ukraine to Kosovo) [5] or to Western Europe (e.g., Moldova to United Kingdom) [6] and Africans are generally moved within their originating region (e.g., West Africans may be moved between Benin, Gabon and Togo). [7]

Large number of women and children from Bangladesh are trafficked to brothels in India and Pakistan annually. A study in Bangladesh on female labour migration and trafficking reportedthat for those women went on visa for domestic or company related work. sex work was an integrated part of their job and for about 10 per cent women it was the only occupation. [8]

In a study by United Nations Children's Fund (UNICEF) it is reported that children aged between 12 and 16 are the main victims of human trafficking across Africa. They are recruited as soldiers and sold into prostitution and forced labour. In Kenya, Zimbabwe, and Ghana, girls as young as 8 years old were sold as brides for their "purity" playing on people's fears of HIV infection. Children from war ravaged West African countries were often sold as slave to work in tea, cotton, and cocoa plantations. Girls from Togo were trafficked from home as domestic servants. In Malawi, European tourists ask for child prostitutes.

Some of those children are sent to Europe as sex slaves also. The report described a vicious circle of abuse, in which child victims later became the abusers. In Tanzania trafficked children, later returned to their village to recruit new victims to work in the country's mines. [9]

US government estimates yearly trafficking into the United States at 14, 500 to 17, 500 people, 80% of who are female. [10] Nongovernmental organizations (NGOs) estimated that 16000 persons are trafficked into Canada per year. [11]

Trafficking in India and its Legal Aspects:

There are several constitutional provisions for citizens of India such as equality, prohibiting discrimination, personal liberty, dignity, education etc. Article 23 of Constitution of India prohibits traffic in human beings (In any form and for any exploitation and forced labour. Article 24 prohibits employment of children in any hazardous employment or in any factory or mine unsuited to their age. Article 42 protects citizens from inhumane working conditions).

According to Section 5 of Immoral Trafficking (Prevention) Act, 1986, attempts to procure, induce or taking a person for prostitution amounts to trafficking. Goa Children Act, 2003, specifically addresses the issue of child trafficking and Indian Penal Code (IPC), 1860 Section 359, 361, 362, 363, 365, and 366 deals with kidnapping, abduction and wrongful confinement. This along with section 366A makes procuration of minor girls under the age of eighteen yearsa punishable offence.

Section 366B prohibits importation of girls (less than 21 years of age) for prostitution and a punishable offence. Section 367 IPC prescribes punishment up to 10 years imprisonment for procuration or import of minors for the purpose of illicit intercourse, kidnapping and abduction leading to grievous hurt, slavery or subjection to unnatural lust.

Section 370, 371, 372, 373 and 374 of IPC prohibits selling, letting to hire or otherwise disposes of any person under the age of 18 years with intent that such person shall at any stage be employed or used for the purpose of prostitution or illicit intercourse with any person or for any unlawful and immoral purpose or knowing it to be likely that such person will at any age be employed or used for any such criminal purpose. Section 375 and 377 of IPC which deal with rape and unnatural sexual offences respectively, and section 376 IPC which prescribes punishment for rape and custodial rape are also applicable in the given context. Section 319, defining hurt, Section 320 defining grievous hurt and section 351 of IPC defining assault are also relevant in regard to harassment or torture of trafficked victims.

Beside various sections of Indian Penal Code as mentioned above, specific relevant acts that have the provisions of punishment for trafficking of human beings in India for specific purposes include

- 1. Immoral Trafficking (Prevention) Amendment Act 1986
- 2. Child Marriage Restraint Act, 1929.
- 3. Bonded Labour System (Abolition) Act, 1976
- 4. Juvenile Justice (Care and Protection of Children) Act 2000
- 5. Child Labour (Prohibition and Regulation) Act 1986
- 6. Transplantation of Human Organs Act 1994.

As per data published by National Crime Record Bureau, Crime in India [12] (2009), total of 2,851 incidents of crimes under various provisions of laws, relating to human trafficking were reported in the country during 2009 as compared to 3,133 during 2008, recording a decrease of 9.0% during 2009.6,402 cases relating to human trafficking were reported during 2005 as compared to 5,096 and 4,087 cases, reported in 2006 and 2007 respectively.

Procuration of Minor Girls has shown a rise from 145 cases in 2005 to 237 cases in 2009. Importation of Girls has shown a fall from 149 cases in 2005 to 48 cases in 2009. Selling of Girls for Prostitution has shown a rise from 50 cases in 2005 to 57 cases in 2009. Buying of Girls for Prostitution has shown a rise from 28 cases in 2005 to 32 cases in 2009. Cases related to Immoral Trafficking (Prevention) Act 1956 have shown a fall from 5908 cases in 2005 to 2474cases in 2009.

Purpose of Trafficking:

Trafficking initially gained recognition because increasing numbers of migrant women and children were detected in situations of forced prostitution. More recently, the spotlight has broadened to include the plight of a much wider group of people trafficked for various forms of laborexploitation in agricultural, construction, cleaning, nursing, manufacturing, textile, fishing and mining sectors. [13-14] In many regions, people are trafficked for forced begging and petty theft. Women and children are frequently trafficked for domestic work and childcare and females as wives-to-be. [14] Other common reasons of trafficking of children are prostitution, child pornography, forced labor, slavery, and removal of organs, illicit international adoption, child soldiers, begging and for child camel jockeys.

Adverse Health Effects in Victims:

Trafficking involves the denial of human rights, including the right to health. It is essential for physicians to know its extent and health problems, likely to be found in this exploited population. Exposure of trafficking victim to various health risks may lead to permanent loss or abnormality of physiological and anatomical structure or function amounting to impairment.

Sexual Exploitations of females. includes both natural sexual offence such as rape and unnatural sexual offence such as sodomy and buccal coitus. Beside physical and genital injuries, such patients may present with rape trauma syndrome (post-traumatic stress disorder) which consists of behavioural, somatic and psychological reactions that occur as a result of forcible rape or attempted forcible rape. In extreme cases, death may occur due to shock caused by emotion or fright or blunt force.Haemorrhagic shock can occur due to blood loss from injuries to genitals and perineum.Suffocation due to closure of mouth and nostrils or strangulation may result in death. It can also lead to mental derangements. convulsions and epilepsy. Psychological trauma is much more when victim knows the rapist. [15-19]

HIV prevalence among women prostitutes has been well documented. Sexually transmitted infections may also be present in form of vaginal discharge, genital ulcers, warts and infections like candidiasis and trichomoniasis.

Exploitation of Children, include sexual abuse by physical contact like fondling a child's genitals, masturbation, oral-genital contact, digital penetration, and vaginal and anal intercourse. Non-contact abuse includes exposure, voyeurism and child pornography. [19]

Impact of sexual abuse of children includes physical injuries over genitals, STD's, HIV, unwanted pregnancy, menstrual problem, behavioural problems like low self-esteem, sadness, drug and alcohol abuse and emotional problems such as anxiety, depression and suicidal tendency.

Mental health symptoms were widely reported by women in the European study, for post-traumatic stress disorder (PTSD), depression, anxiety and hostility. [20-22] Children are also used in camel races (Child Camel Jockey).Beside this they are abused sexually and physically. They are kept undernourished to prevent weight gain and stay within the vicinity of track. Children may get injured by camels or by fall or at times may die.

Those trafficked childreninvolved for begging usually have aggressive behaviour and may suffer from psychological trauma. Such children face social isolation and repeated arrest/detention.

Trafficked children are also forced to work in different occupations and industries which have adverse effect on their mental and physical health.. They are also exposed to many occupational hazards such as, contact with animals causing zoonotic diseases like anthrax, brucellosis, accidents by machineries.toxic hazards by insecticides, gases and metals, physical hazards such as heat and cold, humidity leading to dehydration, radiation causing leukaemia, noise causing deafness, vibration causing irritability, vertigo and poor light leading to diminution of vision. and nystagmus. Apart from this pneumoconiosis, occupational cancers and dermatitis are other occupational hazards.

Victims of trafficking may also suffer from food deprivation leading to many nutritional disorders like Iron deficiency anaemia, goitre due to iodine deficiency, visual problems due to vitamin A deficiency, Scurvy due to vitamin C deficiency, rickets and many other similar disorders. Malnutrition also leads to increase susceptibility to infections such as TB, Leprosy, and Scabies etc.

The research in Europe has documented the physical and psychological health risks and consequences of 192 women attending post-trafficking assistance services. It was reported that 59% of women had been physically or sexually abused prior to leaving home, with 12% reporting that they were sexually abused before the age of 15. Within the first 14 days of arriving at a service centre, women presented with following physical health symptoms: headaches (82%); fatigue (81%); dizzy spells (70%); back pain (69%) and gynaecological symptoms (vaginal discharge, 70%; pelvic pain, 59%; infection, 58%). [20-21]

Forensic Medical Examination of Victims of Trafficking:

Forensic medical examination, as specific intervention, is a highlydesirable element of emergency health care provided or victims of trafficking. [23] This is helpful in corroborating the facts of the case with allegation of trafficking, arrest of the responsible and redressing and rehabilitationforthe victims.

Bodily Injuries: Complete body examination from head to toes is done to look for injuries and signs of malnutrition. Documentation of physical and genital injuries with its location, pattern and duration is done. Patterned bruise and abrasions must be looked for. Slap marks from the hand digits, looped or flat contusions from belts or cords, contusions from fingertip pressure, scratches from fingernails, parallel contusions from contact with a linear object, and contusions from the heels and soles of shoes, burn marks and other such marks give a clue about the torture suffered by the victim. These findings are of great importance in future legal proceedings. Proper radiological examination with [23] radiographic films is of highly significant evidentiary value.

Genital Éxaminations: Local examination of genitals is done for injury and other signs of sexual assault. Samples of blood (blood in gauze), orifice swabs (anal, vaginal), hairs, urine, clothing and any other important sample/article is taken and sealed for further examination.

Identification: In case, the identity related documents of trafficked persons are destroyed by the trafficking organizations [22], identity can be established by handwritings (If possible), body marks, fingerprints, photographs, blood grouping and DNA fingerprinting.

Age Estimation: Age estimation is to be done with the help of physical development, dental examination (OPG), secondary sexual characters and radiological examination. This is particularly important in cases of sexual offences, importation of girl for prostitution and bonded or child labor.

Clinical Examination and Laboratory Investigations: Medical examination may also disclosedisorders such as undernourishment, vitamin deficiencies or other alterations due to unfavourable living conditions.

Clinical examination is not only a good screening opportunity for sexually transmitted infections (Syphilis, Gonorrhea, Chlamydia, HIV/AIDS, Hepatitis B and C) among trafficked victims but also for protection of public health. [23] For diagnosis of sexually transmitted diseases, samples from genital lesions should be procured after cleaning with saline.

Pus, exudates or a biopsy specimen from lesions serve as the ideal sample. Simultaneously, samples should be taken for serological tests. Direct microscopy of the lesion material using Gram's stain, dark ground microscopy or fluorescence microscopy may facilitate diagnosis of gonorrhoea, chancroids, syphilitic chancre or donovanosis. [24-26]

Herpes simplex virus infected genital lesions can be diagnosed by light microscopy using Tzank smear. [27] Lesions of Human papilloma virus and Lymphogranuloma venereumare mainly diagnosed clinically.

Nucleic acid detection by PCR (Polymerase Chain Reaction), TMA (Transcription Mediated Amplification) and LCR (Ligase Chain Reaction) is an increasingly common means for diagnosis of sexually transmitted infections. PCR based assays have been developed for H. ducreyi, T.pallidum and HSV. [24]

Serological testing (by VDRL or RPR) is the most commonly used methodfor diagnosis of syphilis.The confirmatory tests are the fluorescent Treponema antibody absorbed (FTA-ABS) and Treponema palladium hemagglutination test (TPHA). [26] Serologic diagnosis of HIV can be done by ELISA, rapid assays and western blot.

Signs of Organ Removal: In case any organ has been removed illegally without consent or by fraudulent means the same can be examined by surgical scar, Ultrasonography, CT scan or angiography.

Psychiatric Evaluation and Rehabilitation: Proper psychiatric examination and management of psychiatric problems is essential for the victims of trafficking. They should be counselled for proper rehabilitation and restoration of faith as victims. Those who are drug addict needs to be treated at drug de addiction centres.

Measures for Anti-trafficking Activities:

The United Nations Convention against Transnational Organized Crime (29th September 2003) is the main international instrument and major step forwardfor organized crimes like human trafficking with international cooperation.

The Protocol to Prevent, Suppress and Punish Trafficking in Persons, especiallywomen entered into force on 25 December 2003. This mandates the nations to establish domestic criminal offences for efficient international cooperation in investigating and prosecuting trafficking in person's cases and also establish the protocol to protect and assist the victims of trafficking in persons with full respect for their human rights.

Anti-trafficking measures include prevention, protection or prosecution. Prevention

efforts have involved, public awareness campaigns through television and radio (USAID campaigns in Africa). [28] Protection activities involve assistance like shelters and counselling services. [29] "Prosecution" includes the law enforcement activities of anti-trafficking programmes. Policing and immigration control are areas that should be often the priority. [30]

Conclusion:

Trafficking of human beinas for exploitation is a grave violation of several human rights. National Human Rights Commission in collaboration with UNIFEM and the Institute of Social Sciences and the Report of the National Workshop have made а number of recommendations and suggestions whereby human trafficking could be prevented.Proper plan of action is required to promote steps/activities at the Centre, State, District, Block and Village levels to prevent and end trafficking by involving all stakeholders. Forensic specialists and other health care professionals can also contribute significantly in the law enforcement. medical management and rehabilitation.

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Review Research Paper

Analytical Aspects with Brief Overview of Arsenic Poisoning

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Abstract

Arsenic belongs to the class of metallic poisons. Although arsenic in metal form is not poisonous, since it is not absorbed from the alimentary canal but when it is volatilized by heat, arsenic unites with oxygen and forms poisonous vapours of arsenic trioxide. The toxicity of arsenic or arsenic containing compounds depends on its valence state as well as its organic or inorganic form. Clinical features of arsenic poisoning along with differential diagnosis have been presented. The pre-hospital, hospital and post-hospital management as discussed will help in providing the proper care to the patient along with the specific treatment. The detection and determination of arsenic levels can be done qualitatively as well as quantitatively with help of UV-spectroscopy, Atomic Absorption Spectrometry and Voltammetry etc.

This review paper covers all the analytical techniques in great detail with few case reports cited from literature.

Key Words: Arsenic, Clinical features, Diagnosis, Management, Treatment

Introduction:

Arsenic is the poisonous metalloid found in different allotropic forms. It is denoted by the symbol "As" having an atomic number 33. There are three different metalloids of arsenic, each having different crystal structure. It is steel grey, very brittle and crystalline and when heated, it oxidizes rapidly. [1] The most common compounds are arsenide & arsenate that are poisonous in nature.

Arsenic found in plants and animals is chemically bonded with carbon and hydrogen. This is called organic arsenic and is usually less harmful to other life forms than inorganic arsenic. Under natural conditions, arsenic usually occurs at low levels and is chemically bonded with other elements such as oxygen, chlorine, and sulphur. These are called inorganic arsenic compounds. Inorganic arsenic is the form that can be found in domestic water supplies.

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DOR: 24.01.12 DOA: 31.01.12

Sources:

- Arsenic is used in smelting industry in which it is a by product of ores containing lead, gold, zinc, cobalt and nickel.
- Gallium arsenide, indium & aluminium are used in the microelectronics industry.
- Paris green, Calcium arsenate & Lead hydrogen arsenate are used in pesticides.
- Paris green and emerald green are used as a colouring agent in paints and dyes industries
- Arsenic acid is used as a finishing agent for glass.
- Arsenic trioxide is commonly used in the treatment of cancer and acute promyelocytic leukaemia. [2]

Arsenic Exposure:

- Eating food containing arsenic
- Drinking water containing arsenic
- Breathing ambient air
- Breathing air at work sites

Effect of Arsenic on Environment:

- Arsenic does not evaporate
- It gets into air when materials containing it are burnt
- It settles from the air to the ground
- It doesn't break down, but can change from one form to another. [3]

Mechanism of Toxicity:

All arsenical compounds exert both local as well as remote effects. In early stage, the action of the poison is purely local, and causes acute irritation. [4] With the absorption of the poison the remote action of depression of the nervous system is superadded. The toxicity of an arsenic or arsenic containing compound depends on its valence state, its organic or inorganic form and the physical aspects which include its absorption and elimination. [5] Inorganic arsenic is considered to be more toxic than organic. Organic arsenic is found in fish, seafood, and algae. The specific arsenic compounds obtained from these sources are arsenobentaine and arsenocholine, which are non-toxic and are rapidly excreted in unchanged form in the urine. But in case of inorganic arsenic, it accumulates in the liver, spleen, kidneys, lungs and Gastrointestinal tract. [6, 7]

These may be acute, sub-acute or chronic. Acute poisoning may be caused by intake of large dose at one time and is enough to produce violent symptoms and sub-acute poisoning results from small doses taken/given intermittently over a period of time. Chronic poisoning follows the long exposure to the actions of minute doses of arsenic. [8]

Onset and Duration:

The time elapsing between the intake of the poison and the appearance of the symptoms varies according to whether the arsenic is taken more or less soluble form and whether the stomach at the times contains food or is empty. If arsenic is in solution, or is readily soluble compound, the symptoms will appear in about ten minutes. On other hand, if the arsenic is not a soluble form then the symptoms may be delayed for 30 minutes or more. [9]

Fatal Dose:

The fatal dose of arsenic in an adult is usually stated as 120-200 mg and 2 mg/kg body wt in children [10]. The acute lethal dose of inorganic arsenic to humans has been estimated to be about 0.6 mg/kg/day. This means that for a 70 kg (150 pound) adult, a toxic dose is 42 mg or 0.042 grams. For a 10 kg child, this works out to 6 mg or 0.006 grams. Thus about 14 grams of arsenic is enough to kill more than 100 adults. [11] Exposure to high levels of inorganic arsenic (greater than 100 ppm of arsenic) in food or water can also be fatal. Arsenic and arsenic compounds are known cancer-causing agents and have been implicated in lung and skin cancer and associated with birth defects. [12]

Normal Values:

The normal level of arsenic in whole blood concentration is < 50 mcg/L. The normal level of arsenic in 24 hour urinary excretion is <50 mcg/day. [13] Arsenic in urine can be measured in sample collected within 24-hours; and 48 hours in case of without eating seafood as it may exceed with arsenic poisoning. According to OSHA (Occupational Safety & Health Administration) exposure limit for workers is of 0.05 ppm in arsine over an 8 hour shift. [14] **Table: Levels of Arsenic in Biological Material** [15]

| | L - J | |
|--------|--------------|-------------|
| Matrix | Normal Level | Toxic Level |
| Blood | < 1µg/L | >50 µg/L |
| Urine | < 100 µg/L | >500µg/day |
| Nails | ≤ 1000 µg/L | >1000 µg/L |
| Hair | ≤ 1000 µg/L | >1000 µg/L |

Fatal Period:

In cases of acute poisoning, the average fatal period is 12-48 hours. The shortest period recorded is 45 minutes. In mild and sub-acute doses, a person may survive for several hours. Death may take place as rapidly as an hour after ingestion of the poison. In exceptional cases, the duration of fatal case may be even longer.

Clinical Features/Symptoms

• Acute Arsenic Poisoning:

The symptoms will appear within half an hour but it may be delayed in those cases where arsenic enters the system by routes other than mouth. Acute arsenic poisoning from ingestion results in increased permeability of small blood vessels and inflammation & necrosis of the intestinal mucosa; manifesting as hemorrhagic gastroenteritis, fluid loss and hypotension. Patient initially complains of the feeling of faintness, depression and nausea followed by severe burning pain and constriction in the throat and stomach which increases on pressure. Increased salivation and stomatitis is present. Intense thirst and severe vomiting are constant symptoms. [16]

The vomited matter contains the ordinary contents of the stomach at first, later contains mucus and blood in streaks or spots. Urine is suppressed or scanty, contains albumin and RBCs. Severe pain in the calf muscles as well as other muscles is felt. Skin becomes cold and clammy and the face becomes pale and anxious. Eyes sunken, pulse become feeble, irregular and frequent. Lastly, hypoxic convulsions and coma precede death.

Sub-Acute Arsenic Poisoning:

The symptoms on the taking of the first dose will be those of GIT irritation, but of much milder type than those resulting from ingestion of a large dose. The patient suffers from nausea and vomiting and complaints of dyspepsia and heart-burn. Face may be pale, eyes become suffused and watery, the nasal secretion is increased and the patient suffers from a heavy cold. Prostration becomes extreme, cramps of the muscles particularly of the calves. The vomit may show streaks of blood & the dysentery may follow. [17]

• Chronic Arsenic Poisoning:

The symptoms will appear in 2 to 8 weeks showing changes in the skin and nail, such as hyperkeratosis, hyper pigmentation and exfoliative dermatitis. Transverse white striations of the fingernails are prominent. Sensory and motor polyneuritis manifesting such as numbness and tingling distribution, along with distal weakness and quadriplegia, inflammation of the respiratory mucosa. Consumption of water, containing arsenic at the concentrations in the range of 10 to 1820 ppb causes vasospasm and peripheral vascular insufficiency culminating in "Blackfoot disease". [18] Chronic exposure increases the risk of skin cancer and cancers of the lung, liver, bladder, kidney and colon. [19]

Diagnosis:

There are tests available to diagnose poisoning by measuring arsenic in blood, urine, hair and fingernails. The urine test is the most reliable test for arsenic exposure. Urine testing needs to be done within 24–48 hours for an accurate analysis of an acute exposure. Tests on hair and fingernails can measure exposure to high levels of arsenic over the past 6–12 months. These tests can determine if one has been exposed to above-average levels of arsenic. They cannot predict, however, whether the arsenic levels in the body will affect health.

Hair is a potential bio-indicator for arsenic exposure due to its ability to store trace elements from blood. Bio-monitoring can be done using micro-analytical techniques.

In case of acute poisoning of arsenic, it has to be differentiated from cholera, and mistakes may be done in the process of diagnosis. There will be pain in the throat before vomiting, and the vomited matter contains mucus, bile and streak of blood but in case of cholera the vomited matter is watery and does not contain blood. Voice may not be affected but conjunctivae are inflamed. Stools are usually high coloured, feculent, foetid and discharged with straining and tenesmus.

In case of chronic poisoning, persistent gastric irritation accompanied by numbness and tingling of the extremities, with tendency to paralysis should arouse suspicion, and indicate the necessity of subjecting the urine or other evacuations to analysis. It may be mistaken for Addison's disease or dry beri-beri. [20]

Laboratory Findings:

 When arsenic trioxide is taken, an X-ray of the abdomen shows barium like radioopaque shadow. Urinary coproporphyrin test may be positive. It can also be detected on chemical analysis.

- In acute arsenic poisoning, an x-ray of the abdomen may reveal ingested arsenic, which is radiopaque. The serum arsenic level may exceed 7ug/dL; however arsenic is rapidly cleared from the blood.
- 3. ECG findings may include QRS complex broadening, QT prolongation, ST-segment depression, T-wave flattening, and multifocal ventricular tachycardia.
- Urinary arsenic should be measured in 24hrs specimens collected after 48 hr of abstinence from seafood ingestion. Normally, levels of total urinary arsenic excretion are <500 µg/dL.
- 5. Arsenic may be detected in the hair and nails for months after exposure.
- 6. Abnormal liver functions, anaemia, leukocytosis or leukopenia, proteinuria and hematuria may be detected.

Analytical Toxicology Methods:

A. Spot Test/Screening Test

- Reinsch's Test [21]
- 1. About 20 ml of conc. Hydrochloric acid and 100 ml of water is taken in a porcelain basin.
- 2. Bright copper strip is placed in it.
- 3. Suspected material is added to the basin.
- 4. The solution is again boiled for an hour or more with the addition of water and acid.
- 5. Black stain obtained on the copper strip shows the presence of arsenic.
- Gutzeit Test [22]
- 1. One ml of the solution is taken into a Gutzeit apparatus.
- 2. Two pellets of pure zinc metal are added to it.
- 3. 5 ml of dilute sulphuric acid is poured over the contents.
- Gas evolved during the process is passed over the lead acetate paper to absorb H₂S gas.
- 5. It is then reacted finally with mercuric chloride test paper.
- 6. Yellow stain is observed on the paper which indicates the presence of arsenic.
- Silver Nitrate Test [23]
- 1. 2 ml of extract is taken in a test tube.
- 2. One to two ml of silver nitrate solution is added to it.
- 3. Brownish-red precipitate is formed which is soluble in acids and ammonia but insoluble in acetic acid which indicates the presence of arsenic.

• Silver nitrate - peroxide test [23]

1. One ml of test solution is placed in a micro crucible.

- A few drops of concentrated ammonia solution & 10% (v/v) of hydrogen peroxide are added to it. The solution is warmed for few seconds.
- 3. The solution is acidified by adding acetic acid.
- 4. Two drops of silver nitrate solution is added.
- 5. Brownish red colouration indicates the presence of arsenic.
- Ammonium Molybdate Test [24]
- 1. Two ml of extract is taken in a test tube.
- 2. Ammonium molybdate and nitric acid are added in considerable excess in a test tube.
- 3. Solution is boiled.
- 4. A yellow crystalline precipitate of ammonium arsenomolybdate is observed.
- 5. The precipitate obtained is insoluble in nitric acid but soluble in ammonia solution.
- Bettendorf's test [25]
- 1. A drop of a test solution is taken in a micro crucible. One to two drops of concentrated ammonia solution are added to it.
- 2 drops of 10% (v/v) hydrogen peroxide and 2 drops of magnesium sulphate solution are added to it.
- 3. Solution is evaporated slowly and finally heated until fuming ceases.
- 4. One to two drops of solution of stannous chloride in concentrated hydrochloric acid are added to it.
- 5. Solution is warmed for few minutes.
- 6. A brown or black precipitate is obtained which shows the presence of arsenic.
- B. Quantitative Analysis:
- 1. Determination of Arsenic in blood by UV Spectroscopy

Standard Arsenic Solution: 1000 ppm solution of arsenic trichloride is prepared in hydrochloric acid. This is diluted serially with water to produce 1 ppm, 2 ppm, 5 ppm and 10 ppm

Silver Diethyl dithio carbamate Solution: A 0.5% solution of silver diethyldithio carbamate in pyridine is prepared.

Stannous Chloride Reagent: 40% of stannous chloride (dehydrate) in hydrochloric acid is prepared.

Digestion Mixture: A mixture containing 3 volumes of nitric acid, 1 volume of sulphuric acid and 1 volume of perchloric acid is prepared. **Analysis**

- 1. 5 ml. of blood sample is digested with 10 ml digestion mixture.
- 3 ml. of digested sample is transferred to the arsenic-generating vessel. Sufficient water is added to produce 35 ml. Now, 5 ml. of hydrochloric acid, 2 ml. of a 15% solution of

potassium iodide and 0.5 ml. of stannous chloride reagent (40%) are added to it.

- 3. The solution is swirled and allowed to stand for 15 minutes.
- 4. A pad of glass wool moistened with lead acetate solution is inserted into the lower tube of the generating vessel.
- 5. 3 ml. of silver diethyl dithiocarbamate solution is introduced into the absorber tube.
- 6. 3 gm. of granulated zinc is added to the flask.
- 7. Two parts of the apparatus are assembled together. The evolution of arsenic for 1 hour is allowed.
- 8. Silver diethyl dithiocarbamate solution is now transferred from the absorbed tube to a 1 cm cell and the absorbance is measured at 540 nm using in the reference cell a blank prepared by treating 5 ml. of water in the same manner.
- Above procedure is repeated using 5 ml. each of diluted standard solutions. The absorbance of each of the solutions is measured.
- 10. The concentration of arsenic in the sample of blood is determined from the curve obtained by plotting the absorbance of each of standard solutions against the concentration of arsenic. [23]
- 2. Determination of Arsenic in Urine by AAS with Arsenic generator

Standard Arsenic Solution: is prepared as described above

Stannous Chloride Reagent: 20% of stannous chloride dihydrate in hydrochloric acid is prepared.

- Analysis
- To 25 ml. of urine sample 1 ml. of a 20% solution of potassium iodide and 0.5 ml. of 20% stannous chloride reagent are added, mixed and allowed to stand for 20 minutes. The arsenic generator is isolated from the spectrophotometer and 100 ml. of the sample solution is introduced into the vessel. 0.5 gm of granulated zinc and 1 ml. of hydrochloric acid are added.
- 2. Two parts of the generator are assembled immediately and stirred for 2 minutes with a magnetic stirrer. The arsenic generator is now connected to the spectrophotometer and the absorbance is recorded at 193.7 nm.
- The above procedure is repeated using 25 ml. of each of the diluted standard solutions and 25 ml. of water as blank
- 4. The absorbance of each of standard solution of arsenic is plotted against the concentration of arsenic and the

concentration in the unknown sample is known from the calibration graph.

3. Voltammetric determination of Arsenic in Blood and Urine

Preparation of 1000 ppm Copper: 0.3968 gm of copper nitrate of high purity is taken in a 100 ml volumetric flask and made up to the volume of 100 ml.

Preparation of 1 ppm Selenium: 0.14196 gm of selenium dioxide is taken in a 100 ml volumetric flask and 2-3 drops of sodium hydroxide is added to it and made up the volume to 100 ml with water. Then 0.1ml is taken from the prepared solution in a 100 ml volumetric flask and made up to 100 ml with water.

Preparation of standard solution: 0.132 gm Arsenous oxide (As_2O_3) is taken in a 100ml volumetric flask and two pellets of sodium hydroxide is added to it and made up to 100 ml with water which is 1000 ppm Arsenic. 1 ppm standard solution of arsenic is prepared by diluting 0.1 ml of 1000 ppm stock solution of arsenic to 100 ml water.

Sample Preparation:

- Suitable amount of sample is taken in vessel and 15 ml digestion mixture (50% Conc.HNO₃) is added.
- 2. The vessel is put inside the microwave digestion system properly. Microwave digester system is started under following programme.
- 3. After cooling, door of microwave digester system door is opened. Digested sample is transferred to 50 ml volumetric flask and made up to mark with water and used for analysis.

Analysis

- 1. The electrode is washed well with distilled water.
- 2. 10 ml water, 1ml HCl, 0.05 ml 1000 ppm Cu, 0.08 ml 1 ppm Se and 0.35 ml reducing agent are taken in volumetric vessel and voltammograms are recorded for blank under the following conditions.

| Parameters | Description | | |
|-----------------------------|--------------------------|--|--|
| Working electrode | Hanging Mercury Dropping | | |
| - | Electrode | | |
| Calibration | Standard addition method | | |
| Stripping | Cathodic | | |
| Mode | DP- Differential pulse | | |
| Number of standard addition | 2 | | |
| Initial purge time | 300 s | | |
| Deposition potential | 440 mV | | |
| Deposition time | 60 s | | |
| Equilibration time | 10 s | | |
| Start potential | 400 mV | | |
| End potential | 900 mV | | |

3. After completion of blank voltammograms, 0.1ml of digested sample is added in volumetric vessel and voltammograms is recorded under same conditions.

- 4. After completion of voltammograms of sample, 0.1 ml of 1ppm standard solution is added and voltammograms are recorded under same conditions.
- 5. At last voltammograms of arsenic are obtained. Fig 1 and 2.

Fig. 1: DPAS Voltamogram of Arsenic obtained from standard addition technique with number of replications being 2. A) 0.1 ml sample in acidic medium + 10 ml distilled water, B) A + 0.1 ml standard solution of Arsenic (1 ppm), C) B + 0.1 ml standard solution of Arsenic (1 ppm) Determination of As in blood sample



Fig. 2: The calibration plot of Arsenic obtained from standard addition by DPCSV technique



4. Determination of Arsenic in Blood by ICP

Standard Arsenic Solution: is prepared as described above under heading 1

Digestion Mixture: A mixture containing 5 volumes of nitric acid, 3 volume of sulphuric acid and 2 volume of hydrogen peroxide is prepared. **Analysis**

- 1. 5 ml of blood sample is digested with 10 ml of digestion mixture.
- 2. The solution is heated on a pre-heated hot plate till the colour of the blood disappears.
- 3. The solution is swirled and allowed to stand for 10 minutes.

- 4. 2 ml of nitric acid is added to it and the solution is heated for few minutes.
- 5. After heating, the solution is diluted with distilled water which is ready for analysis.
- 6. Two parts of generator are assembled immediately. The arsenic generator is now connected with ICP and the absorbance is recorded at 193.6 nm.
- 7. The above procedure is repeated using 5 ml of water as blank and then 5 ml of standard solutions.
- 8. The absorbance of each standard solution is plotted against the concentration of arsenic and the concentration of unknown sample is known thereafter from the calibration graph. [25.26]

Household Remedies for Arsenic Poisoning:

Eggs, onions, beans, legumes, and garlic should be given to obtain sulphur because it helps in eliminating arsenic from the body. The amino acid cysteine also provides sulphur and it is also available in tablet form as well. In case of accidental arsenic ingestion, immediately 5 charcoal tablets should be given, and then 5 more every fifteen minutes until reaching health care provider or the emergency room of the nearest hospital. The diet should be supplemented with plenty of fiber daily.

Pre-Hospital Management:

Quickly assess the patient for airway, and ensure adequate respiration and pulse. Maintain adequate circulation. In case of skin exposure, wash exposed skin and hair with mild soap and water and rinse thoroughly with water. In case of eye exposure, flush exposed or irritated eyes with plain water or saline for at least 15 minutes. Persons with evidence of significant exposure and all persons who have ingested arsenic trioxide should be transferred to a medical facility for evaluation. [27]

- Provide support to airway, breathing, and circulation.
- Exposed persons whose skin or clothing is contaminated with arsenic trioxide can contaminate rescuers by direct contact or through release of inhalable dust so adequate barrier methods should be used like face mask and covered clothing.
- There is no serious risk of secondary contamination after clothing is removed and the skin is washed.
- Arsenic trioxide is irritating to the skin, eyes, and respiratory tract. Systemic effects can occur from all routes of exposure and may include severe gastrointestinal injury, lifethreatening shock, and nerve damage. [28]

- **Hot Zone:** Rescuers should be trained and appropriately attired before entering the Hot Zone. If the proper equipment is not available, or if the rescuers have not been trained in its use, call for assistance or other properly equipped response organization.
- **Rescuer Protection:** Arsenic trioxide dust is readily absorbed through inhalation and can irritate the respiratory tract. Although it is poorly absorbed dermally, skin contact should be avoided because arsenic trioxide can irritate the skin as well.
- **Respiratory Protection:** Positive-pressure, self-contained breathing apparatus (SCBA) is recommended in response situations that involve exposure to potentially unsafe levels of arsenic trioxide or combustion products (arsine and arsenic trioxide fumes).
- **Decontamination Zone:** Patients who are able and cooperative may assist with their own decontamination. Remove and double-bag all contaminated clothing and personal belongings.

Hospital Management/Treatment:

1. Acute Arsenic Exposure:

Remove patient from source of arsenic; if skin contamination wash with copious water; seal contaminated clothing. Use caution to avoid hypothermia, particularly with children and the elderly. Flush exposed or irritated eyes with plain water or saline for at least 15 minutes. Remove contact lenses if easily removable without additional trauma to the eye. Gastric decontamination or gastric lavage should be performed for ingested poison.

The next step is to promptly remove the poison from the stomach. If the stomach is full, and no vomiting has occurred, it should be emptied by giving tartar emetic or copper sulphate. If not, the stomach should be washed with large draughts of warm milk and water and then administering freshly prepared hydrated ferric oxide in tablespoonful doses suspended in water. Calcined magnesia mixed with an equal quantity of animal charcoal may be administered. Gastric lavage with 1% sodium thiosulphate in water is useful.

2. Sub acute & Chronic Arsenic Exposure:

Source of poisoning after identification must be removed to prevent further poisoning. Drinking water should be arsenic free. British anti lewisite is the specific chelator used. Chelation therapy with BAL or penicillamine may be used in case of chronic poisoning. Chelation therapy is a series of injections of ethylenediaminetetraacetic acid with dimercaprol (BAL). DMPS or meso-2, 3-dimercaptosuccinate acid is also effective. Coenzyme Q(10) improves circulation of the blood which allows the toxic substances to leave the body. L-Lysine, an amino acid, detoxifies harmful heavy metals from body systems. Rutin & apple pectin can be given to bind with unwanted toxic metals and remove them from the body through the intestinal tract. [29, 30]

British Anti-lewisite (BAL)

British anti lewisite (BAL dimercaprol; 2,3-dimercaptopropanol) most commonly used as a chelator in the treatment poisoning of arsenic. Administration of BAL is 3-5mg/kg intramuscularly every 4 hours for 2-10 days depending upon the toxicity. The half-life is very short with complete excretion within 4 hours. [31]

• Succimer (DMSA)

Succimer is an oral analogue of BAL that chelates arsenic (and other metals including lead, zinc and mercury). The arsenic-succimer complex is usually excreted through kidneys. It is given orally in a dose of 10 mg/kg (to a maximum dose of 500 mg) three times daily for five days and then twice daily for a further 14 days. Dosing can also be done on a body surface area basis at 350 mg/m². [31]

• D- Penicillamine

This is an oral chelating agent that binds to iron, lead, arsenic, antimony, zinc, mercury, and copper. It is less effective in comparison with other agents. The D-penicillamine-arsenic complex is renally excreted. The usual dose is 25 to 35 mg/kg/day in divided doses with titration over a few weeks. It must be given on an empty stomach with no food ingested within the next 1 to 2 hours. Cross allergy between penicillin and d-penicillamine may occur. Therefore it should be given with extreme caution in patients allergic to penicillin.

Chelation therapy is not useful if the source of arsenic has not been removed. Succimer is the chelating agent advised to those patients without life-threatening arsenic poisoning. British Anti-Lewisite (BAL) is usually preferred. Iron and zinc supplementation can be given between the chelation therapies.

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Review Research Paper

Bite Marks: Teeth as Weapons of Violence

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Abstract

The teeth are a significant component of our natural arsenal. Based on the mathematical and statistical evidence, it is presumed that each human dentition is unique and hence it can be a useful fact in investigating various crimes. There are a variety of situation, criminal as well as non-criminal when one can come across a bite mark. Sometimes tool marks may have presentation similar to bite marks. Further, the presentation of bite marks is influenced by different factors which may complicate their identification. As such, the bite marks become an important yet complicated evidentiary aspect. Thorough knowledge of the bite marks is necessary for a Forensic Odontologist to provide a credible, critical and competent testimony with respect to the evidence presented.

This article is an attempt to discuss all about bite marks. It differentiates between human and non-human bite marks and also about the bite marks in inanimate objects.

Key Words: Bite Marks, Human, Animal, Foodstuff

Introduction:

McDonald defined bite mark as "a mark made by the teeth either alone or in combination with other mouth parts." [1] Like fingerprints, the bite marks can be a tool for identification in the Forensic Department, as the specific marks left by the teeth of an individual while biting, their arrangement, morphology and other characteristics being almost unique for each individual. [2] Although distorted by the elastic properties of the skin tissue, anatomic location, etc, use of proper step by step investigation and thorough knowledge of the subject, bite marks may disclose the identity of an individual. [3]

Crimes involved in Bite Marks:

Bite mark injuries are found in some of the most serious crimes and may often be the only physical evidence available, especially in the late presenting living victim. [4, 5]

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****Dean, SDS, Sharda University, Greater Noida Bite marks may be found on living or dead individuals where the person may be victim of the crime or perpetrator of the crime. Crimes featuring bite marks include abuse (child, spouse and elder), rape, assault, homicide and sometimes other cases like robbery. [6] These can be classified as:

- 1. **Sexually Oriented Bites**: They are inflicted slowly and deliberately with suction applied to the tissue by tongue and lips. The resultant injury exhibits central or peripheral "suck marks" and marks of anterior teeth with good definition.
- 2. Child Abuse Marks: In child abuse cases either aggressive (anger bite marks) or sexually oriented types of bite marks are seen.
- 3. Self Inflicted Bite Marks: Mostly found on forearms of the children caused by them (to stop crying, due to intense pain or because of fear). These are non-criminal types of bite marks.

Mentally retarded and psychologically disturbed people may also inflict bite on themselves. Self inflicted bite marks are also seen in Lesch-Nyhan syndrome. [1]

Anatomic Location of Bite Marks:

It is important that dentists, police officers, social workers, forensic pathologists and others involved in the criminal justice system be aware of where bite marks are most commonly found. It is also important to remember that bite marks can be both, attack injuries (and therefore present on the victim) and defensive wounds (and therefore present on the suspect), and all individuals suspected of involvement in a crime against a person need to be examined for such marks. [7]

Different studies have indicated different orders/ frequencies of involvement of various sites but the various sites /anatomic areas most likely to be bitten are breasts, arms, legs, abdomen, back, face, shoulder, buttocks, genitalia, thighs, hand, chest, neck, nose, ear, foot etc. [1, 4]

According to a study, females were 4 times more likely to be bitten than males. Females are most likely to be bitten on the breast, arm and legs. Most males are bitten on the hand, back or face and children on their genitals, legs and back. [4]

The anatomic location of a bite mark is also crucial in determining its potential to be analyzed. If the bite mark injuries are on locations like breast, it presents a considerable problem as breast tissue is highly mobile and easily deformed and therefore it can be difficult to determine the position of the breast during biting or the effect of the bite force on the deformity of the tissue and hence the injury. Bite marks on the arm and legs can be similarly affected, depending on their position at the time of biting. [8, 9]

Presentation of a Bite Mark Injury:

A representative human bite is described as an elliptical or circular injury that records the specific characteristics of the teeth. (Fig. 1&2) The injury may be shaped like a doughnut with characteristics recorded around the perimeter of the mark. Alternatively, it may be composed of two U-shaped arches that are separated at their bases by an open space. The diameter of the injury typically ranges from 25-40mm. Often a central area of bruising can be seen within the marks from the teeth. [7, 10]

Classification of Bite Marks:

Several classifications of bite marks exist. They vary in complexity according to the degree of specificity designated with respect to the identification of the perpetrator of the bite (i.e. non-human and human) and the material bitten. [2]

I. Classification by Cameron and Sims (1974): [2]

- A. Non-Human(Animals)
- B. Human
- 1) In food stuffs (e.g. in part-eaten foodstuffs abandoned by offenders at scene of crime)
- 2) On non-biological objects (e.g. pencils, pipestems, detonators)
- 3) In human skin:

- i. Non-criminal (erotic bites)
- ii. Criminal (ordinary and sexual assaults) which may be :
 - a) Offensive (upon victim by assailant) or
- b) Defensive (upon assailant by victim)
- II. Another Classification of Bite Marks: [11]
 - 1. Human (Children, Adults):
 - a) Animal Mammals Canine Rodents Porcine Marine Miscellaneous
 - **b)** Reptiles
 Snakes (poisonous & non-poisonous)
 Miscellaneous
 - **c) Fish** Shark
 - Barracuda Miscellaneous General fish depradation
 - d) Mechanical Full dentures Saw blade Miscellaneous
 - 2. Skin& Body Tissues (Human, Animal):
 - a) Foodstuffs: Fruit Pastry Cheese Miscellaneous

b) Other Materials and Substances: Chewing gum Pipe stems Pens and pencils Point and woodwork Miscellaneous

Agents:

- Human: Children may get bite marks from other children (siblings or playmates) in boisterous play or by reason of aggression, jealousy or plain curiosity. The number of perpetrators or suspects is limited. Incidents relating to adults mainly refer to crimes like sexual assault, assault and battery and unlawful killing. In these circumstances the possible perpetrators may be numerous. Victim may be bitten as a part of assault or the assailant may be bitten as a part of defense by victim. [11]
- 2. **Animals:** Bites may be inflicted by animals both wild and domestic, either as provoked or unprovoked attacks. These attacks may be before the death or after the death of the

individual as a source of food by these animals. [11]

Animal bites are usually distinguishable from human bite injuries by differences in arch alignments and specific tooth morphology. Animal bites often cause shear rather than impact injuries, producing lacerations of the skin and open wound. [12, 13]

a. **Mammals:** Dog bites, perhaps the most common non-human bite, are characterized by a narrow anterior dental arch and consist of deep tooth wounds over a small area. A dog or other carnivorous mammal is more likely to cause avulsion of human tissue during violent biting.

Cat bites are small and round with pointed cuspid-tooth impressions caused by the conical shape of the teeth. [13, 14]

- b. **Reptiles:** Snake bites are the most frequent in reptiles. One has to distinguish between the poisonous and non-poisonous snakes. A lot of varieties of poisonous snakes are found in the tropical climate. It is possible to obtain plastic wound replicas of the marks left in skin by poisonous snakes. [11]
- c. **Fishes:** Bites from fish can occur in temperate coastal waters and in fresh water. The main attacks are carried out on bathers and swimmers both inshore and offshore.

The main attackers include sharks and the great barracuda. The bite wounds from barracuda are straight cuts rather than the curved cuts made by sharks due to the relative shape of the jaws. [15]

One should differentiate between the bite wounds found on the victim are the cause of the death or occurred after the death of the individual as the body was immersed in the water.

3. **Mechanical:** The bite marks may be produced by full dentures or partial dentures. In the wax bite registrations of such persons the marks left by anterior false teeth appear relatively easy to recognize while in association with the natural teeth of the dentition. [11]

Definitions of marks made by teeth (Jackobsen and Keiser-Nielsen 1981)

- Tooth mark Mark left by a tooth (human or non-human)
- Arch mark Mark produced by four or five adjacent teeth in the same arch
- Bite mark Mark made by the teeth either alone or in combination with other mouth parts (McDonald 1974).
- Tooth marks produced by antagonist teeth. [1, 2, 6, 16]

Many of the marks have been produced by mechanical means by articles that have a tooth-like edge. In the weapons confiscated by 'football vandals' there are many which leave marks which have to be assessed and interpreted. There are sharpened metal combs, sharpened bicycle chains, cog wheels attached to sticks in the manner of mediaeval maces and even saws and saw blades used to inflict wounds which could be classified as 'toothmarks'. [11]

Materials:

1. Skin And Body Tissues:

a) **Human:** The particular site of the bite mark may have some relationship to the type of offence. Many bite marks are received during the normal course of an affray. Ears and fingers would appear to be usual sites for this particular injury which may be the only bite mark injury and is given in the heat of moment and may not be well defined. [17]

Bites given as a part of a sexual crime may be numerous and slowly given. Sometimes these marks are well defined. In these type of crimes the sites are breast and neck and sometimes abdomen and thighs, especially if the victim is unconscious. [18]

There are occasions when the assailant is bitten on the hand in attempting to stifle the cries of the victim or the hands of the victim when the assailant has forced the hands of the victim against his or her own mouth. [19]

Bite marks have to be examined extremely carefully to reveal all details which could lead to the perpetrator. Details of the mark could reveal the position of the assailant at the time of the bite and perhaps the approximate time before death that the bite was inflicted. [20] The shape and size of the marks and shape and size of the arch are relevant to the characteristics of assailant's dentition. Many experts hold the opinion that such evidence is more reliable as the means of eliminating persons suspected of having made bite marks rather than stating categorically that the individual did in fact make a particular mark. [19] Evidence of bite marks in a case is usually only supporting evidence.

b) **Animal:** There are cases when the animal e.g. dog bites the human being, but there are some cases where the roles have been reversed. [11]

2. Foodstuffs:

Fruits (most common is apple) and cheese seem to be the most popular food stuffs that exhibit bite marks that are left at scene of crime like murder or burglary. [20] One is constantly surprised that such evidence is left at the scene in the form of an unfinished morsel and if it had been entirely consumed could obviously destroy the evidence that places the suspect in a particular locus at particular time.

Food stuffs are subject to considerable shrinkage and distortion which in turn distorts the marks in question. Apples will lose a great deal of water content and unless impressions can be taken of the marks within a short time, or the apple placed in a preservative medium, the associated marks will be clueless as evidence.

There are two media which have been found to be of use in preserving the stability of the dimensions of apples. They are Mixtures of alcohol and formalin or Alcohol, glacial acetic acid and formalin. [11, 21]

Cheese when left exposed to air at normal temperature very soon loses a certain amount of its water content and then its fat content, depending upon the type of cheese concerned. [11] Other food stuffs which may be helpful as bite marks evidence are pastry, meat pie, toffees and chocolates. (Fig. 3, 4) But their quality decreases as the ambient temperature increases. [22]

3. Other Materials and Substances:

At various times pipe stems, pens and pencils may be left with some bite marks and can be investigated for the comparison of bitemarks. Such hard and rigid substances do not usually provide good study material. Death of young children can occur as a result of lead poisoning. Examination of paint, wood work and toys as a source of toxic substance and tooth marks may be helpful in these situations. [11]

Factors Influencing the Bite Marks: [1, 2]

- 1. Status of the Tissue:
- Site: Type of tissue or condition of skin

e.g. i) loose skin or excessive subcutaneous fat demonstrates easy and extensive bruising leading to poor bite mark definition.

ii) Areas of fibrous tissue or high muscle content tend to bruise less readily and thus are more likely to demonstrate a bite mark.

- **Age:** Infants and elderly individuals bruise more easily than other age groups.
- Sex: Females tend to bruise more easily than males. Once produced, a bite mark will be evident for a longer period of time on females as compared to males.
- 2. Time elapsed between the Actual Biting and when the Impression is Made:

Depressions of the skin that occur in bite marks usually recover within 10-20 minutes after the bite, although discoloration and swelling may be present for 24 to 72 hours on a living subject. After death, the skin (and thus bite mark) tends to contract, harden and eventually decompose.

3. Manner in which Bite-Mark is Made

- 4. Force Exerted by the Biter: Apart from bruising abrasions, indentations and lacerations, its appearance may also be influenced by amount of sucking and thrusting by the tongue.
- Number of Teeth Involved:
 More the number of teeth in the bite mark better are the likelihood of identification. Relationship of upper and lower teeth can

also be ascertained.6. Type of Teeth Involved:

Upper anterior teeth are most commonly seen in the bite marks. Morphology of the teeth (broad/narrow etc.) should be noted. Lateral incisors being shorter in length may sometimes not appear in the bite marks giving the impression of being missing.

7. Number of Dental Peculiarities: More the number of peculiarities of dentition better are the identification.

8. Reaction of the Surrounding Tissue:

Bite marks made hours or days before 'the event' will show inflammatory changes and signs of healing (microscopically) in contrast to bite marks made at death or after death which show minimal if any bruising due to absence of circulation.

9. Medical Status:

People having bleeding disturbances, under anticoagulant therapy and certain skin diseases bruise more.

Bite Marks in Food Stuff: [2]

The appearance of bite marks in food stuffs is also affected by several variables.

1. Type of Food and Manner of Biting:

Terminologies such as three dimensional bite, tentative bite, complete bite, sliding bite are used to describe bite marks in food. To overcome this confusion, Webster classified them into three types:

- **Type I-** Bites that are found in materials which fracture readily with a limited depth of penetration. Bites of this type will record the most prominent incisal edges of the upper and lower anterior teeth up to a depth of 1-2mm. e.g. chocolate.
- **Type II-** Bites of this type are those where a good group of the material is obtained by the teeth and bitten piece is removed by fracturing it from the main material e.g. apple. This type of bite shows a record of the outline of labial aspect of upper and lower incisors and tooth scrape marks tend
to record the most prominent elements of the teeth anteriorly.

- **Type III-** Bites of this type are produced by biting through the material such as cheese. It indicates relative positions of upper and lower incisors in centric occlusion from the extensive scrape marks. [25]
- Depth of Penetration of Teeth: More the depth, better record of the labial aspect of the teeth obtained.
- 3. Time and Temperature

Conclusion:

Bite marks can be a very critical piece of evidence. Careful extraction of such evidential aspects based on the knowledge of bite marks can allude to the inner psyche of the perpetrator.

Motives, intent and proclivities surface from the surreal to the reality of human inclinations. From the scientific perspective, they offer the real-world association between the victim and the suspect.

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Fig. 2



Fig.3





Review Research Paper

Surrogacy: A Modern Era Dilemma

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Abstract

Surrogacy or surrogate motherhood is an arrangement whereby a woman agrees to become pregnant & deliver a child for a contracted party. She may be the child's genetic mother or may act as a gestational carrier. Surrogacy these days has reached industrial proportions with India fast emerging as the leader in it due to the congenial legal environment. Surrogate motherhood is a modern day dilemma which is now fast becoming a common alternative to the painful birthing process by the rich & a blessing to those who have tried every other procedure without a fruitful result. The concept of surrogacy is a multifaceted issue involving many individuals with varied beliefs, expectations & interests. It is not as simple as it seems but involves a plethora of complex moral, ethical, psychosocial & legal issues which need to be addressed for better understanding & handling of such a case.

Key Words: Surrogacy, Alternative, Issues, Industry, Moral, Ethical, Psychosocial, Legal

Introduction:

The term surrogacy or surrogate means substitute. In medical terms, surrogacy means using a substitute mother in place of natural mother. It is an arrangement whereby a woman agrees to become pregnant & deliver a child for a contracted party.[1] Surrogacy is a multifaceted issue involving many individuals whose beliefs, expectations & interests are not always aligned when it comes to the details of what is a complex & intrusive process.

Types:

- 1. Traditional surrogacy: the surrogate is pregnant with her own biological child, but this child was conceived with the intention of relinquishing the child to be raised by others such as biological father & his spouse or partner.
- 2. Gestational surrogacy: The surrogate becomes pregnant via embryo transfer with a child of which she is not the biological mother. She may have made an arrangement to relinquish it to biological mother or father to raise or to a parent who is unrelated to the child.

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Associate Professor, Dept. of Forensic Medicine, SGRDIMSAR, Amritsar. E-mail: navpreet125@gmail.com *Assoc. Prof, Dept. of Community Medicine, **Assist. Prof, Dept. of Forensic Medicine, ***Prof. & Head, Dept. of Forensic Medicine, ****Prof, Dept. of Forensic Medicine, DOR: 16.03.12 DOA: 08.07.12 As when the child is conceived using egg donation, sperm donation or donated embryo, such mother is known as gestational carrier.

- 3. Altruistic surrogacy: It is a situation where the surrogate receives no financial reward for her pregnancy or the relinquishment of the child although all expenses related to pregnancy & births are paid by the intended parents. [2]
- 4. Commercial surrogacy: It is a form of surrogacy in which the gestational carrier is paid to carry a child to maturity in her womb & is usually resorted to by rich infertile couples who can afford the cost involved.

History of Surrogacy:

Having another woman to bear a child for a couple to raise, usually with the male half of the couple as the genetic father is an antique concept. Babylonian law & custom allowed this practice. [3] Attorney Noel Keane is recognized as the creator of the legal idea of surrogate motherhood. The idea however became feasible only when he developed association with physician Warren J. Ringold in the city of Dearborn, Michigan. Both Keane & Ringold were widely criticised by politicians & press but they continued & eventually advocated for the passage of laws that protected the idea. [4]

Surrogacy is resorted to by:

- 1. In c/o female infertility
- 2. Medical issues which make pregnancy or delivery risky
- 3. Females fertile & healthy but unwilling to undergo pregnancy
- 4. Homosexual male couples intending to become parents

- 5. Single male wishing to have his own biological child
- 6. Single woman who is unable to bring pregnancy to full term

Ethical Issues:

Compensated surrogacy or commercial surrogacy or paid surrogacy refers to a form of surrogacy in which a gestational carrier is paid to a carry a child to maturity in her womb & is usually resorted to by well off infertile couples who can afford the cost involved. There is a concern that if the practice of commercial surrogacy keeps going the way it is, it could change from being a medical necessity for infertile woman to a convenience for the rich. [5] The various ethical questions arising from surrogacy are:

- 1. What if the surrogate decides to keep the baby?
- 2. What if the surrogate & the spouse violate the abstention clause?
- 3. What if the surrogate with genetic ties demands to visit her child?
- 4. Is handing over a child after delivery for a fee"baby selling"?
- 5. Is it wrong for a surrogate to abort?
- 6. Is there anything wrong with a surrogate giving her unused embryos to someone else?
- 7. What are the pros & cons of using unused embryos for medical research?
- 8. Is there anything wrong with disposal of unused embryo?

These issues reauire serious deliberation & thought before taking any decision regarding surrogacy. A study by the family & child Psychology Research centre at City University London, in 2002, concluded that surrogate mothers rarely had difficulty relinquishing rights to a surrogate child & that the intended mother showed greater warmth to the child than mothers conceiving naturally.[6]

Anthropological studies of surrogates have shown that surrogates engage in various distancing techniques throughout the surrogate pregnancy so as t ensure that they do not become emotionally attached to the baby. [7]

Moral Issues:

The concept of surrogacy has also raised many moral & psychosocial issues. Fears have been expressed about possibility of the inappropriate use of surrogates as convenient method of reproducing for non-medical reasons. Surrogacy serves as an ideal solution to the problems of those who are worried about ruining their figures by pregnancy. Money is crucial factor for many surrogates. If commercial surrogacy were to become an alternative to adoption, it would be so only for the wealthy.

The concepts of child bearing & child rearing are very closely associated. Surrogate motherhood challenges it in a way as to who is the legal mother of the child. Under British Law, a woman who gives birth to the child is regarded as legal mother. The eventual mother would have to adopt the child legally even if she is the genetic mother. [8]

If the child born is handicapped or retarded, who would be responsible for the infant? In such a case, usually neither the surrogate nor the commissioning couple willingly assumes responsibility.

What if the commissioning couple seeks a divorce before the child is born? In such a case who would be entitled to the custody of the child? What if both the commissioning parents die before the birth of the child? The surrogate mother may feel that she is in no way obliged to continue with the pregnancy or give birth to the child, because she is merely interested in the money. [9]

Legal Issues:

The legal aspects surrounding surrogacy are very complex & mostly unsettled. There is a default legal assumption in most countries that the woman giving birth to the child is the legal mother. In some jurisdictions, the possibility of surrogacy has been allowed & the intended parents may be recognized as the legal parents from birth. In U.K, no contract or surrogacy agreement is legally binding. In most states in the U.S, compensated surrogacy arrangements are either illegal or unenforceable.

In some states in Australia, arranging commercial surrogacy is a criminal offence & any surrogacy agreement giving custody to others is void. In Canada & Newzealand, commercial surrogacy has been illegal since 2004, although altruistic surrogacy is allowed. In France, Germany and Italy, surrogacy, whether commercial or not is unlawful. [10]

Indian Scenario:

India is emerging as a leader in international surrogacy & a destination in surrogacy related fertility tourism. Indian surrogates are being increasingly popular with fertile couples in industrialized nations because of the relatively low cost. Clinics charge between \$10,000& \$28000 for the complete package, including fertilization, surrogate's fees & delivery of the baby at the hospital. Including in it the cost of flight tickets, medical procedures & hotels, it comes to roughly a third of the price compared with going through the procedure in U.K. Surrogacy in India is relatively low cost & the legal environment is favourable. [11]

Citizenship of Children Born:

In a landmark judgement in a case which had no precedents in the country in the Guiarat state. High court in India conferred Indian citizenship on twin babies fathered through compensated surrogacy by a German national in Anand district. The court decided the case in hand by inclining to recognize the surrogate mother as the natural mother of the children & since the mother was an Indian, the children were granted Indian Citizenship & passports under legal provisions. However, as India does not allow full fledged dual citizenship, children will have to convert to overseas citizenship of India if they are also going to be taking foreign citizenship of the biological parents' country. [12]

In 2008, The Supreme Court of India, in the Manji's case (Japanese Baby) has held that commercial surrogacy is permitted in India with which the International confidence has increased in going in for surrogacy in India.

The Law commission of India has submitted the 228th report on "Need for legislation to regulate assisted reproductive technology clinics as well as rights & obligations of parties to a surrogacy." The following observations had been made by the law commission.

- 1. Surrogacy arrangement will continue to be governed by contract amongst parties, which will contain all the terms requiring consent of the surrogate mother to bear child, agreement of her husband & other family members for the same, medical procedures of artificial insemination. reimbursement of all reasonable expenses for carrying child to full term, willingness to over the child born to the hand commissioning parent(s), But such arrangement should not be for commercial purposes.
- A surrogacy arrangement should provide financial support for surrogate child in the event of death of commissioning couple or individual before delivery of the child, or divorce between the intended parents & subsequent willingness of none take delivery of the child.
- 3. A surrogacy contract should necessarily take care of life insurance cover for surrogate mother.
- 4. One of the intended parents should be a donor as well, because the bond of love

affection with a child primarily emanates from biological relationship. Also the chances of various kinds of child abuse which have been noted in cases of adoptions will be reduced. In case, the intended parent is single, he or she should be a donor to be able to have a surrogate child.

- 5. Legislation itself should recognise a surrogate child to be legitimate child of the commissioning parents without there being any need for adoption or ever declaration of guardian
- 6. The birth certificate of the surrogate child should contain the names of commissioning parent(s) only.
- 7. Right to privacy of the donor as well as surrogate mother should be protected.
- 8. Sex selective surrogacy should be prohibited.
- 9. Cases of abortion should be governed by MTP Act only.[13]

The proposed Assisted Reproductive Technology Bill lays down the following guidelines:

- 1. It defines a "couple" as two persons living together & having a sexual relationship.
- 2. A woman in the age group of 21-35 can become a surrogate mother. She will be allowed 5 live births, including her own children. She will not be allowed to donate oocytes more than 6 times in her life.
- 3. In case a single man or woman, the baby will be his or her legitimate child.
- 4. A child born to an unmarried couple using a surrogate mother & with the consent of both the parties shall be the legitimate child of both of them.
- 5. During the gestation period, the couple will bear the expenses of the surrogate & give monetary help to her. The couple may enter into an agreement with the surrogate
- Foreign couples must submit two certificates- one on their country's surrogacy policy & the other stating that the child born to the surrogate mother will get their country's citizenship.
- 7. Foreign couple will have to nominate a local guardian who will take care of the surrogate during gestation.
- 8. ART banks, accredited by the government will maintain a data base of prospective surrogates as well as storing semen & eggs & details of the donor.

State boards will give accreditation to the ART banks – private & govt. The board will have a registration authority which in turn

will maintain a list of all IVF centres & monitor their functioning.

Before deciding to become a surrogate it is advantageous to be well informed of the rights & seeking legal counsel is necessity. Once the contract is agreed upon & signed, the surrogate loses her privacy. The intending mother is privileged to accompany the surrogate to her medical appointment & be present during examination.

When it comes to compensation to the surrogate, it is again a legal issue. The surrogate is usually paid \$ 10,000 for her services upon completion of her contract. If the contract is not fulfilled, she gets nothing (if she backs out). If pregnancy results in miscarriage, surrogate receives partial payment.

A possible checklist has been formulated for the surrogate & the intending couple to explore with their attorney's.

- 1. Surrogate' spouse or significant other must agree to sexual abstinence & at certain times must submit to medical examination.
- 2. Surrogate must forfeit her privacy
- 3. Infertility physician or if insurance is not assessable, the infertile couple will assume all costs.
- 4. Psychiatrist/ psychologist/ counsellor should assist in surrendering the child to the infertile couple & counselling
- 5. Birthing hospital provide birth certificate information

All parties must agree to provide affidavits, a court appearance & testimony to effectuate the designated mother & father of the unborn foetus. The courts will honour contracts & agreements between surrogate & intending parents, unless circumstances change that will jeopardize the best interest of the child. [14]

Conclusion:

Surrogacy is not a simple arrangement. It is an extremely complex contract agreement. Exploitation, extortion, & ethical abuses in surrogacy trafficking are rampant & surrogate mothers are misused with impunity. It is a free trading market, flourishing & thriving in the business of babies. Both the surrogate & the infertile couple should obtain legal counsel before agreeing to & signing a contract.

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A Case Study of Postoperative Death in IL Nail Removal

*P. Uma Maheswara Rao, **P. Sarat Kumar Babu

Abstract

Patient about 48 years age, Male, admitted in the Department of Orthopaedics, Govt. General Hospital, Kakinada with a complaint of pain and discomfort while walking in his right leg. Coming to history Inter locking nail was fixed for fracture of right tibia 4 years back. On taking X-ray Right ankle shows IL nail with Tibia and diagnosed as post-operative malunited fracture tibia with wrong distal locking.

The Patient was admitted on 10.08.2009 for removal of Inter Locking nail after routine investigations and was operated on 12.08.2009 and removed the IL nail without any complications during Surgery. On the same day after 6 hours patient developed burning sensation and breathlessness. After sometime the patient became unconscious. Even though the patient was shifted to Respiratory Intensive Care Unit, he expired on 13.08.2009 at 04.15 AM. As the relatives staged dharna alleging negligence of Doctors, Case was registered by the Police U/S 174 Cr.P.C. and body was sent to the Forensic department for Post-mortem.

Key Words: Fracture tibia, IL Nail, Postoperative malunited fracture, wrong distal locking

Introduction:

Postoperative death of patient usually called for allegations of medical negligence on the part of the doctor. This case report highlights similar situation of alleged medical negligence. Compulsory autopsy by Forensic Medicine expert is necessary to know the cause of death.

Brief History of Case:

A 48 years old male was admitted in the Department of Orthopaedics, Govt. General Hospital, Kakinada on 10.08.2009 at 12.31AM with a complain of Pain in Right ankle region since one month. There is History of Operation for fracture of Right Tibia 4 years back in Govt. General Hospital, Kakinada.

On Examination:

A swelling was present on the post medial aspect of the Rt. ankle region. X-ray Rt. ankle shows IL nail with Tibia and diagnosed as post-operative malunited fracture tibia with wrong distal locking. He was operated under S.A. with tourniquet applied on 12.08.2009 and IL nail is removed, wound is closed after securing haemostasis and was shifted to ward. On the same day, Patient complained of severe burning pain all over the body.

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*Assistant Professor, Dept. of Forensic Medicine & Toxicology, Rangaraya Medical College, Kakinada, A P E-mail: druma_pothula@yahoo.in ** Professor DOR: 27.05.11 DOA: 06.07.12 Patient was shifted to RICU at about 02.25A.M. On 13.08.2010 Patient became unconscious at about 03.45 A.M. and in spite of all the Life saving measures taken Pt. expired at 04.15 A.M. on 13.08.2009. Then the Patient relatives started Dharna with the body, alleging Medical Negligence of the treated Doctors.

Investigations:

Hb - 9 gm , RBS - 102 mg% , Blood urea - 35 mg% , S. Creatinine - 1.5 mg%

Post-Mortem Findings:

External Injuries:

- A sutured wound of 5 cm on lower aspect of Rt. knee extended up to upper aspect of Right leg
- 2. A sutured wound of 3 cm is present on front of Right ankle.

Internal Injuries:

Corresponding to external injury No.1 and 2 there is removal of steel implantation along with removal of nails which were there for old healed fracture of Right tibia. All the tissues at the operated site are severely congested. Areas of bluish black discoloration at the operative site present.

Brain Congested. Both Lungs were enlarged and severely congested on c/s perivascular haemorrhagic spots seen in both lungs. Heart Walls, valves and coronaries are normal. Liver enlarged and congested. Pancreas, spleen and kidneys congested. Kidneys on c/s show marked cortico pyramidal demarcation seen. Adrenals congested. Heart, Brain, bits from Liver, Spleen,

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Kidney and Lungs sent to HPE to the Dept. of Pathology.

Photo 1a: External Injuries



Photo 1b: External Injuries



Photo 2a: Internal Injuries



Photo 2b: Internal Injuries



Photo 3a: Lungs



Photo 3b: Lungs



Photo 3c: Lungs



Photo 4: Kidneys



Microscopic Appearance: Brain--NIL particular but for partial autolytic changes

Heart-- NIL particular

Lungs--Show severe congestion and intraalveolar haemorrhage

Kidney--Shows focal glomerular sclerosis. Spleen and Liver -- Show severe congestion

Histo-Pathological Examination:

On histopathology examination there was pulmonary congestion with intra alveolar haemorrhage.

Photo 5a: Microscopic pictures of Lungs



Photo 5b: Microscopic pictures of Lungs



Final Opinion:

On perusal of Case Sheet findings, P.M.E. findings, H.P.E. findings the death is due to a ARDS in a case of Post operative Interlocking extraction for malunited old Tibia fracture.

Discussion:

The syndrome known as ARDS was described in 1967 in 12 patients with Acute Respiratory failure, hypoxemia refractory to oxygenation, decreased lung compliance and alveolar opacities on the Chest X-Ray[4]. The authors reported that although all of the patients presented these common findings, there was a significant variety of results that caused the syndrome. Since its description, there has been a great deal of controversy in regard to the incidence of ARDS, partially due to lack of standardised diagnostic criteria's but also due to the shortage of large population based perspective studies addressing this issue.

Before 1992 the acronym ARDS represented the adult respiratory distress Syndrome. The American European Consensus Committee AECC- on ARDS standardised the definition in 1994 and renamed it acute rather adult respiratory distress syndrome than because it occurs of all ages. [4] The term acute lung Injury (ALI) was also introduced at that time. The committee recommended that ALI be defined as "a syndrome of inflammation and increased permeability that is associated with a constellation clinical, radiologic of and physiologic abnormalities that cannot be explained by, but without left atrial or pulmonary capillary hypertension. [1]

ARDS is a clinical syndrome characterised by acute onset of Respiratory distress accompanied by:

- 1. Decrease Arterial O₂ pressure
- 2. Decrease Lung compliance
- 3. Development of diffuse pulmonary infiltration
- 4. D.A.D. diffuse alveolar damage--is a morphological counter part of ARDS.

Microscopically the process is divided into exudative, Proliferative and Fibrotic phases. In

acute exudative phase there will be capillary congestion, interstitial and intra alveolar oedema and haemorrhage. [2]

Conditions Leading to ARDS:

Primary damage to Alveolar epithelium leads to ARDS. In some cases prime target is endothelium. But ultimately both are involved.

Conditions Associated with Development of ARDS: [5] [6]

- 1) Infections
- 2) Gastric aspiration
- 3) Trauma
- 4) Fracture with fat embolism
- 5) Burns, chemical injury
- 6) Haematological conditions
- 7) Pancreatitis
- 8) Poisons.

Nevertheless compelling there is evidence that neutrophils most and macrophages are involved on mediating the injury in most cases. Early in course of ARDS there is little evidence of generalised thrombosis. AECC histologically defined it as presence of DAD. [3] After the study and conclusions, the accuracy of AECC are less than satisfactory due to low +ve protective value and low +ve likelihood ratio. The objective of this study was to evaluate the accuracy of the ARDS diagnostic criteria proposed at the AECC in comparison with Histopathological data obtained from Autopsies.

Conclusion:

In Autopsy we find severe congestion and Perivascular haemorrhages in both lungs. Microscopically the lung shows severe congestion with Intra Alveolar haemorrhages. Wherein by comparison of the Autopsy findings and microscopic findings we came to the conclusion that the cause of death results possibly is ARDS as death occurred between 12 - 24hrs postoperatively.

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Extreme Sexual Violence by an Intimate Partner

*Memchoubi Ph., **H. Nabachandra

Abstract

On 11-9-11 at 3p.m. police received information that on the same day one unknown female dead body was found lying in the hills of Cheiraoching, a hillock in the many hill ranges bordering the city of Imphal. The victim appeared to be in her early twenties. She was naked from the waist down and was found among the grasses and shrubbery of the hillside. The media reported it as a case of gang rape and murder. The public was shocked that such a heinous crime could be committed right in the midst of a thickly populated locality and under its very nose. The case is reported here for its extreme nature and the confusing circumstances which could mislead the investigation. Prevention initiatives need to be taken up and supplementary evidence-based and gender-specific initiatives have to be developed to especially address the forms of violence that instigate fatalities.

Key Words: Strangulation, Sexual Violence, Murder, Mutilomania, Victim

Introduction:

Gender-based violence persists as a global public health problem. In 2000, there were an estimated 119 000 female homicides worldwide, for an overall age-adjusted rate of 8.8 per 100 000 population [1], the highest rate being in South Africa. [2] Where both fatal and non-fatal violence against women has become the order of the day, accurate descriptions of the extent and occurrence of violent incidents are required for targeting resources, developing relevant interventions, and enabling more reliable comparisons of national and global female homicide victimization information.

In general, strangulation [3] is one of the most common forms of violent asphyxia, and accounts for approximately 10–20% of all homicide deaths in a range of countries.

The case is reported here for its extreme and bizarre nature so that it will serve as an eyeopener for future similar incidents.

Case Report:

On 11-9-11 at 3 p.m. police received information that on the same day one unknown female dead body was found lying in the jungle of Cheiraoching hill. This was a popular pilgrimage site bordering the city of Imphal, adjoining a thickly populated community.

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*Assistant Professor, Dept. of Forensic Medicine, Regional Institute of Medical Sciences, Imphal E-mail: mem010177@gmail.com **Professor and Head DOR: 12.11.11 DOA: 01.06.12 The body was found naked from the waist down. The clothes and handbag of the victim were lying nearby. Later on the victim was identified and brought for post-mortem examination.

Post Mortem Examination:

It was found that the victim wore only the upper clothings consisting of a red and black checked shirt, an inner white sleeveless T-shirt and black brassieres. These clothes were blood and mud stained. A pair of black jeans and pink panties was found with the body. The panties were also blood stained. The legs of the jeans were mud stained on the front as if she had been dragged in the prone position while she was wearing them.

The face was deeply cyanosed and congested. There was bleeding from the mouth, nose and the vagina. The conjunctivae were congested, the neck veins were engorged. The nipples were absent with only some tags of tissue remaining around the edges and the base white and smooth like a thin scar.

A ligature mark of strangulation, 12cmX1cm, was seen on the front of the neck, more marked on the left side and slightly going upwards towards the left mastoid region, 4.5cm below the left ear and just above the thyroid cartilage in the midline. There were multiple abrasions, sizes ranging from 1cm X 0.3cm to 1.7cm X 0.2cm on the front of the neck, 2cm left to midline. Abrasions and bruises were also present on the breasts. There were extensive graze abrasions on the back and outer aspect of both arms. Multiple bruises were seen on the arms, front of both knees and legs. One unusual finding was that the nipples were absent with the peripheral tissues remaining and a thin whitish scar in the main area of the nipples. Examination of the private parts revealed bleeding per vaginum, a laceration, 1cmX0.5cmXmuscle in the right labia minora, and multiple abrasions and bruises in perineum. Hymen showed a tear at 6 O'clock position. Injuries were fresh at the time of death.

On internal examination, there was extensive extravasation of blood in the muscles of the neck; the hyoid was fractured though the thyroid cartilage was intact. The organs were found to be deeply congested and petechial haemorrhages were seen in the lungs. There was spirituous odour in the stomach and about 300gm of semi-digested food was also present. The uterus was within normal limits and did not show signs of pregnancy.

Within a few days, the accused was apprehended by the police. On police interrogation, he confessed that he had been having an affair with the victim for about 1 year. On that fateful day he had called out the victim for a date and they had been drinking and cohabited after which an argument ensued which ended in the death of the victim.

Discussion:

The highest rate of intimate female homicide in the world, with 8.8 per 100 000 women age 14 years and older murdered by an intimate partner was seen in South Africa in 1999. [2] A higher female to male ratio has been reported by many studies. [4, 9, 11-13]

The victim in this case report is in her early twenties. Her gender and age fall within the vulnerable category. [5, 6, 8, 11] Victimperpetrator relationship has been reported to be primarily intimate. [5, 6, 13] In this case, the perpetrator happened to be her boyfriend whom she had been seeing for almost a year.

Ligature strangulation is reported as the most frequently recorded method of asphyxial homicide. [3, 7, 8, 10, 11] In this case, a scarf that the accused was wearing was used for the strangulation. Further, causing death by strangulation and then leaving the body in that undignified state in the jungle indicates a malicious intent much beyond that meets the eye. The absence of the nipples could be a pointer to a surreptitious act of mutilomania.

The severity and multiplicity of the injuries indicate extreme violence. The bruises and lacerations in the private parts indicate not a completely consensual cohabitation. Strangulation presents as a method favoured by assailants that are considerably physically stronger than their victims. [6] This is also consistent with the reported association of sexual violence with strangulation. [14]

Gender inequity, patriarchal power, and the feminization of poverty [15] could be responsible for the gender based violence. The socio-economic state of a society is related to the safety of its womenfolk. The developing economy of the backdrop has a role in the occurrence of such a crime. A direct association has been reported between alcohol inebriation and vulnerability to strangulation [5, 6] and, more broadly, urban violence [17] and abuse trends. [16] Alcohol was found in the body of the victim and accused also confessed that both of them were drunk at the material moment.

Conclusion:

The aim of this case report is to highlight that extreme sexual violence by an intimate partner does occur even in an innocuous community. Prevention initiatives need to be taken up and supplementary evidence-based and gender-specific initiatives have to be developed to especially address the forms of violence that instigate fatalities. Alert policing, and medical service dedicated law are necessary. Stronger legislation aimed at protecting women; universal screening of victims of intimate partner violence; community-level substance abuse and domestic violence prevention programmes; and accessible and affordable support services and networks are some of the critical prevention initiatives that require development and support at both the local and national levels.

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Photo 3: Mutilation of the Nipple



Photo 1: Congestion of the Face and Bleeding From the Nose



Photo 2: Ligature Mark of Strangulation



A Fatal Injury to the Gluteal Region and Perineum by a Disc Harrow: A Case Report

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Abstract

Agricultural accidents over the years have grown many manifolds due to the increased use of modern machineries. Among the different farm machineries used in agriculture, Harrow is used for breaking up and smoothing out the surface of the soil, for deeper tillage, to follow the rough finish left by ploughing operations, to break up clods (lumps of soil) and to provide a finer finish, a good tilth or soil structure that is suitable for seedbed use. Here we present a case, where a child met with a fatal incident in the farm while his parents were ploughing the field with one of the modern advanced ploughing machine "**the disc harrow**". This shows the gross negligence on the part of the parents. The sacrum of the boy was split into two in the midline. This case stresses upon the safety measures to be taken during farming using modern machine tools.

Key Words: Agriculture, Machineries, Disc Harrow, Safety Measures, Sacrum

Introduction:

In ancient days and even now in some parts of our country farming equipments are driven by domesticated animals and even by manual labourers. But as the technological advances have grown, most of them have become tractor-mounted, i.e. attached to the rear either by a drawbar or mounted on the three-point hitch. [1] Many machines have been incorporated into farming which has improved the yield as well as saved time. And consequently occupational risk in agriculture has grown manifold .People get injured, disabled or even lose their lives while working with farm machineries. These injuries can be limb amputation, crushing or shearing of limb or body as a result of entanglement to moving machine parts, while folding and unfolding discs and harrows, or while repairing machinery in workshops. Some injuries may also occur as a result of slipping or falling while getting into or out of the tractor cabin or when climbing on top of any other farm machinery.

It happened to be an uneventful day for a 12 yr old boy who was watching his father work in the field on a tractor. The tractor had a disc harrow mounted on its rear end.

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Senior Resident Department of Forensic Medicine, PGIMER, Chandigarh E-mail: muralig_1984@yahoo.co.in Prof and HOD, DOR: 14.2.12 DOA: 16.2.12 Suddenly the boy ran and tried to sit over the frame of the disc harrow with his face towards the rear end of the harrow. Unfortunately the tractor was moving and the boy slipped backwards onto his face and in the process, the back of his body made contact with one of the discs which was very sharp.

Autopsy Findings:

An incised wound of length 19 cm and a maximum width of 7.2cm with acute ends was present over the middle of the gluteal region, extending from the spinous process of L5 vertebra to 2 cm behind the inferior attachment of scrotum, cutting the lower half of anal canal sagittally. (Fig 1) The upper end showed tailing which continued as an interrupted reddish scabbed abrasion running up to the medial angle of the left scapula. The left margin of the wound was vertical and in the midline where as the right margin was curvilinear with concavity on its medial aspect. The wound margins showed extravasation of blood, as also adherent fine mud particles.

The underlying muscles, sacrum (along the median sacral crest, except for a small length of the promontory anteriorly on the right side), and coccyx were cut along their entire length in the midline with exposure of the posterior surface of the rectum and a part of the colorectal junction .The split portions of sacrum were oriented in the form of inverted 'v' due to the pull of its attachments on either sides. Thin layer of haematoma was present in the superficial perineal pouch anterior to the bladder. (Fig 2) Median sacral artery was torn at the level of S1 along with other blood vessels (branches of internal iliac artery and vein) and nerves over the internal surface of the sacrum. All internal organs were pale. The cause of death was reported as hemorrhagic shock caused by a heavy sharp cutting weapon.

Discussion:

Harrows are of four types namely disc harrow, tine harrow, chain harrow and chain disk harrows. A **disc harrow** (fig 3) has a series of sharp metal (iron or steel) discs which have slight concavity and are arranged into two or four sections. [2] Disc harrows are primarily used to chop up soil that has been recently ploughed to eliminate clumps and loosen the soil if it has been packed. As they move, the soil gets loosened while being picked up which is affected by concavity of the harrows. [3]

The tailing of the wound in this case showed that the vehicle was moving forwards and the boy fell in the opposite direction (fig 4). This is one of a rare case in which the sacrum has been split in the midline with clean cut margins without any injury to the underlying rectum and the sigmoid colon. Also the blood has seeped into the superficial perineal pouch via the fascial planes without any bleed into the abdominal cavity. The Colles fascia underneath the lower end of the wound was injured leading to the seepage of blood into the perineal pouches.

This case also stresses upon the gross negligence on the part of the parents. Had the boy been restricted in those areas of machine farming, which should have been the norm, the disaster could have been averted. To the best of our knowledge, injury to the sacrum in the manner described above has never been reported in the literature.

According to International Labour Organisation (ILO) database (1999), about 170,000 agricultural workers are killed each year out of 330,000 fatal workplace accidents occurring worldwide.[4] As per the estimate of (WHO, collaborating Centre for Research and Training in Safety Technology, Indian Institute of Technology, New Delhi (IIT, 1992)), the agricultural related activities account for 5,000 to 10,000 deaths, 15,000 to 20,000 amputations and 1,50,000 to 2,00,000 serious injuries every year in the states of Haryana, Punjab and Uttar Pradesh.

Regarding power thresher incidents Verma et al [5] conducted a study in the region of northern India (Punjab) and reported that human factors accounted for about 73%while machines accounted for 13%.According to The All India Coordinated Research Projects (AICRP) on human engineering and safety in agriculture (1995–1999) [6-9] Northern India leads in mechanisation of farming in the country followed by central, southern and eastern India. The rate of accidents per 1,000 workers per year was highest in the southern states. (3.64), while Machinery related accident rate/1,000 machines/yr showed lowest in the northern states. Also the tractor accidents were lowest in the northern states tractor population.

The tractor and tractor implements, with other machineries accounted for the maximum number of farm accidents and among them the tractor again scoring (27.7%). The AICRP data from central India, was detailed by Tiwari et al [10], and noted the overall incidence of accidents as 1.25/1,000 workers/yr. 93% of the victims were males and majority were in the age group of 30-39yrs. It was also noted that most of the accidents in the farms in the age group less than 14yrs were caused mainly by tractors and other machinery, livestock, building structures and falls. According to AICRP data, children sustained about 10% injuries in Eastern India whereas it was around 2-5% in other parts of the country.

According to AICRP data the annual fatality rate was estimated to be 22 per 100,000 farmers, which was very much similar to some of the advanced countries. Agriculture has been considered as one of the most perilous industries in the USA. [11] The farming fatalities in Australia were reported as 20.6 per 100,000 workers. [12] Whereas in Canada the annual fatality rate was estimated to be around 11.6 per lakhs farmers. [13]

Due to large number of accidents occurring as a result of agricultural machineries, the Government of India enacted the **"Dangerous Machine Regulation Act, 1983"** to provide for the regulation of trade and commerce in and production, supply, distribution and use of the product of any industry producing dangerous machines with a view, to securing the welfare of labour operating any such machine and for payment of compensation for the death or bodily injury suffered by any labourer while operating any such machine, and for matters connected therewith or incidental thereto.

Conclusion:

Though India is a developing country, the safety regulations in the usage of these deadly machineries in farming cannot be stressed upon much .Educating people about the hazards of improper usage of these machineries through mass media should be taken at all levels-Ministry of Agriculture, the district municipalities, farmers, regional farmers' associations/organisations and other concerned persons.

Furthermore, employees, students and schoolchildren who study on tractors and other agricultural machineries should receive relevant knowledge about the safety requirements. Through all the above mentioned measures, along with safe working practices and periodical training, the incidence of agricultural hazards can definitely be reduced. The last but not the least is the role of parents/guardian in restricting children in the vicinity of hazardous work.

Fig 1: Injury to the Gluteal Region caused by the Disc Harrow



Fig 2: Collection of blood in the Superficial Perineal Pouch Anterior to the Urinary Bladder



Fig 3: Disc harrow with the tractor mounting equipment



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An Unusual Case of Rupture of Gravid Uterus

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Abstract

Spontaneous rupture of uterus is rare. Uterine rupture can occur in pregnancy or at the time of delivery. The reported incidence of spontaneous uterine rupture is about 1 in 15,000 deliveries and it is more likely in women of high parity. Manner of death in a case of spontaneous unscarred uterine rupture is natural. Here we came across one case that fifth gravid arum female of 09 months pregnant $(G_5P_4L_2A_2)$. She went to bring water on a well. She came at home with pot on the waist with full of water. She started pain in abdomen at her home. So brought to the hospital and died before the admission in the hospital. Foetus in uterus was viable and he also died. On postmortem examination, we found rupture of uterus due to prolonged labor. In developing countries like India timely Hospitalization of pregnant women can decrease the incidence of rupture of gravid uterus.

Key Words: Multiparity, Rupture uterus, Hemorrhage, Natural death, Pregnancy,

Introduction:

Rupture of gravid uterus is rare. It is obstetric emergency condition. Rupture of gravid uterus is usually associated with high maternal mortality. Spontaneous rupture of uterus during pregnancy is usually involves upper segment and generally occurs in later months of pregnancy. Multiparity is one of the major causes of rupture of gravid uterus. We report an unusual case of rupture of gravid uterus of 9 month pregnancy which leads death of both mother and fetus.

Case Report:

A fifth gravid arum female of age 35 years, $(G_5 P_4 L_2 A_2)$ went on the well to bring the water. She brought the water in the pot supported on the waist. She came at the house and started pain in the abdomen. Relatives brought her to the P.H.C. for the treatment from where she immediately referred to the Medical College & hospital, Latur, where doctor declared her as brought dead. Body sent for the postmortem examination.

On external examination, was thin built, averagely nourished, pale face, eyes semi opened, pupils dilated and fixed, conjunctiva pale, mouth closed with tongue within.

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*Assistant Professor, Dept. of Forensic Medicine, G.M.C.H. Latur, Maharashtra. 413512 E-mail: bansude_mahadev@rediffmail.com **Assoc. Prof. *** Professor & Head DOR: 30.11.11 DOA: 01.06.12 No oozing through mouth, ear, nose. No surface wounds/ injuries noted on body. Signs of pregnancy observed on external examination correspond to gestational age.

On internal examination, no injuries under the scalp, meninges & brain were intact. Heart was normal in size and shape and no gross pathology noted. Both the lungs were intact and pale. All organs were pale & intact. Stomach contained 100 c.c. yellowish colour, semi-digested semi-solid food material, imparting no specific odour. While taking midline incision on the abdominal wall thick red colour Hematoma protruded out. In pelvic cavity 1500 c.c. blood clot was seen. Dimensions of uterus were noted (21 cm x 12 cm x 6.1 cm.).

Vertical rupture was present on anterior & upper segment of body of uterus of size 12 cm x 8cm x cavity deep, with red margins. However a fetus was found in uterus with intact membranes and clear amniotic fluid within. There were no signs of maceration. Baby weighs 2.5 kg. & was 45 cm long &, Head circumference was 32 cm, fine scalp hairs of 1.5–2 cm long were present, testes were in the scrotum, and umbilical cord was 44 cm long. Centers for talus, calcaneum, & lower end of femur appeared. So according to autopsy findings cause of death was "Hemorrhage and shock due to rupture of gravid uterus."

Discussion:

There are so many causes of rupture of gravid uterus like blunt trauma on abdomen, penetrating wound on lower abdomen, criminal abortions, iatrogenic. Uterine rupture can be spontaneous and predisposing factors are scar on uterus due to previous L.S.C.S., fibrosis following bruises, stretching or tearing of uterine muscles in previous labors. Nirmala Duhan et al reported that out of 64,880 deliveries, 92 cases had ruptured uterus, thus incidence of 1:705 deliveries. Average age of incidence is 28 years, 95.5% were multiparae and 73.9% had uterus at 37-40 weeks. [1] Multiparity is known risk factor of rupture gravid unscarred uterus. Spontaneous rupture of uterus during pregnancy is usually involves upper segment and generally occurs in later months of pregnancy. The rupture is more common in the muliparous women, and onset is usually acute but sometimes insidious. [2]

Rupture of the gravid uterus is potentially disastrous event. This obstetrical emergency is almost always associated with high maternal and fetal mortality and morbidity. [3] Schrinsky and Benson reported 22 cases of uterine rupture in gravid with unscarred uteri, 19 (86%) ruptures occurred during labor, and three (14%) occurred before labour. [4]

Golan et al. reported that in 31% cases, the uterine rupture occurred in women with parity of more than five. [5] Kolala S. Gurudut et al reported a case of a female who was pregnant for fifth time and whose previous deliveries were full term normal was died due to spontaneous rupture of unscarred gravid uterus. [6] Maternal death is a rare complication of ruptures occurring outside of a hospital and in women uterus. Analysis of seven modern studies revealed that in developed countries the rate of unscarred uterine rupture during pregnancy is 0.013% and an eightfold increased incidence (0.11%) in developing countries. [7]

Overall uterine rupture accounts for approximately 05% of maternal deaths each year. [8] Oxytocin is widely used, so it not surprising that this uterine stimulant has been administered in majority of ruptures. [9] Rupture of uterus is mostly spontaneous in multiparity women; death in such cases can be labeled as natural. Maternal death due to rupture can be accidental when there is mechanical violence followed by fall on abdomen, justifiable abortion etc. It can be homicidal when mechanical force on gravid uterus is inflicted by another person with blunt, sharp or pointed object.

So during postmortem, autopsy surgeon should look for any ante-mortem injuries specifically on lower abdomen and underlying structures of abdomen. Rupture of uterus associated with contusion or rupture of other organs is strongly suggestive of un-natural manner of death. Present case was fifth gravida with 09 month pregnancy having unscarred uterus, without any other injuries, & hence manner of death was concluded as natural one. **Conclusion:**

In developing countries like India, Government promoting to the peoples for hospitalized deliveries as well as small family norms. Athough in village areas, it appears that people are least aware or less bothered. This may be due to lack of education, secondary role of females in society, ill treatment to the pregnant women. Multiparity is may be due to strong desire for a male child. Multiparty is one of the known risk factor to cause spontaneous rupture which is preventable and timely Hospitalization of pregnant women can also decrease the incidence of rupture of uterus. Manner of death following spontaneous rupture of gravid uterus is natural.

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Photo 3: Placenta with Rupture Margins of Uterus



Photo 1: Blood Clot oozing out due to Rupture Uterus after Incision



Photo 2: Huge Blood Clot with Rupture Uterus after Removing Rectus Muscle

Photo 4: Head of Fetus popping out through Ruptured Uterus Surrounded by Blood Clot





Fatal Wasp Sting with Pre-Existing Undiagnosed Diabetes and Hypertension

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Abstract

The venomous creatures which are responsible for causing death in human beings are Hymenopteras (bees, wasps, and ants), snakes, spiders and scorpions. Among the Hymenopteras, bee sting is more common than wasp sting but the clinical features are similar. Apart from the bodily features which differentiates honey bees form wasps one can also identify the species from the sting history. Honey bees leave behind their barbed stinger in the victim's body and eventually die by evisceration, whereas wasps can sting repeatedly without leaving behind its stinger on the victim's body. Although wasp sting is a rare occurrence, it is not so rare an incident in the rural and forest areas. Local manifestations following stings are common and deaths in this case are mostly due to anaphylactic shock. Non-anaphylactic causes of death are mainly attributed to multi organ failure and acute renal failure and histopathological examination suggest acute tubular necrosis secondary to haemolysis, rhabdomyolysis and direct venom toxicity.

Key Words: Wasp Sting, Envenomations, Co-Morbidities, Acute Renal Failure, Menifestations

Introduction:

The order Hymenoptera includes Apis species, i.e., bees (European, African), vespids (wasps, yellow jackets, hornets), and formicidae (ants). [1] Most deaths related to Hymenoptera stings are the result of immediate hypersensitivity reactions causing anaphylaxis. Less commonly, death occurs from the toxic effects of massive envenomations involving hundreds to thousands of stings. [2]

We report the case of an elderly individual with pre-existing undiagnosed co morbidities who succumbed to multiple wasp stings within 24 hours of the incident. The preexisting ailments were detected at autopsy and confirmed by histopathological examination.

Case Report:

A 68 year old male sustained multiple wasp stings over the face and trunk, while he was working in his farm.

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*Assistant Professor Dept. of Forensic Medicine & Toxicology JIPMER, Puducherry -6 Email: drsiddharthadas@yahoo.com *Assistant Professor, General Medicine *Assistant Professor, Pathology *Assistant Professor, Forensic Medicine & Toxicology **Senior Resident, Forensic Medicine & Toxicology **Senior Professor & Medical Superintendent Dept. of Medicine DOR: 03.01.12 DOA: 19.07.12 When some young children had playfully thrown stones at the wasp hive which agitated them and he became the victim.

He was received at our emergency service department 16 hours after the incident in a state of altered sensorium. The presenting complaint was pain at the site of sting and dizziness. After receiving the first aid at a local hospital, he was referred to our centre, since he had developed left focal seizures and become unresponsive thereafter. Patient was a farmer by occupation with no previous history of diabetes; hypertension or ischemic heart disease.

External Examination:

No stinger was found, wheal and flare around the bite site was not seen, probably due to delayed presentation to our centre. At admission, GCS was poor (6/15), blood pressure was stable at 110/60mm Hg. tachypnea was present (respiratory rate was 40/min). Cardiovascular system and respiratory examination was unremarkable. However. nervous system examination revealed hemi paresis of the right upper and lower limb with no cranial nerve involvement.

Lab parameters were suggestive of hyperglycaemia (Random sugar – 532mg/dl), severe metabolic acidosis(pH- 6.9,bicarbonate -6.7 meq/l, pCo2- 14.8mmHg,PO₂-140.5mmHg) and severe uraemia(serum creatinine- 4.3 mg/dl, urea- 120 mg/dl) with hypokalemia(serum potassium – 2.9 meq/l). Electrocardiogram had ST depression and T wave inversion in inferolateral leads suggestive of myocardial ischemia. Troponin T was elevated. Urine ketones were negative. CT brain (non contrast) was normal. Central venous pressure was high at 20 cm of water. During hospital stay, patient had 50 ml of urine output. Venom specific IgE and serum tryptase level estimation was not done due to lack of this facility at our centre.

A provisional diagnosis of wasp sting induced acute renal failure with metabolic acidosis and hyperglycaemia was made. Patient was started on insulin after hypokalemia correction, antiepileptic (inj. phenytoin) and anti ischemic measures (aspirin, clopidogrel). Dialysis was planned for correction of uraemia and metabolic acidosis. However, patient had a sudden cardiac arrest and could not be revived after resuscitation.

Post Mortem Examination:

On external examination no stinger or any evidence of any local reaction was found. The brain was intact, congested and slightly oedematous. The larynx and trachea were intact, their lumen had no froth, and slight oedema of the larynx was noted. Examination of the heart revealed its weight to be 290 grams, thickness of the left ventricle wall to be 2.5 cm, along with thickening of the papillary muscles (Fig. 1) and right ventricle wall 1 cm thick. Multiple yellowish white plaques of varying sizes ranging from1x1 mm to 4 x 2 mm was present over the intimal surface of aorta. (Fig. 2) Both the kidneys were small and contracted with surface granularity.

Right kidney measured 8.3 x 3.8 x 1.3 cm and left kidney 6.2 x 3.5 x 1.5 cm in size. Cut section of both the kidneys revealed fatty infiltration of the medulla. Rest of the internal organs was normal and only showed features of congestion.

Usual viscera preserved in saturated solution of common salt were sent for toxicological analysis which returned negative results for any kind of toxic substances. Heart with aorta, kidney and brain were sent for histopathological examination which showed the following results.

Heart: Sections from left ventricle showed hypertrophy of cardiac myocytes with nucleomegaly and anisonucleosis. No areas of infarction noted. Multiple sections taken from the aorta showed collagenized and hyalinised atheromatous plaques. Sections from left coronary artery and right coronary artery showed atheromatous plaques with partial luminal obstruction. (Fig. 3)

Kidney: Section from bilateral kidneys showed features of End Stage Renal Disease (ESRD). Glomeruli showed a spectrum of changes. Several of them were globally sclerosed, some of them showed peri glomerular fibrosis and few showed fibrous crescents. (Fig. 4, 5) Few glomeruli showed mesangial hypercellularity along with nodular glomerulosclerosis suggestive of diabetic nephropathy. Tubules showed tubular atrophy and thyroidization along with features of acute tubular necrosis. (Fig. 6) Interstitium showed moderate fibrosis and lymphocytic infiltration. Medium sized arteries showed reduplication of internal elastic lamina and small arteries showed hvaline arteriosclerosis suggestive of changes of benign nephrosclerosis.

Brain: Section from brain showed reactive gliosis with changes of hypoxic ischemic injury with intense eosinophilia in the cytoplasm of neurons. No areas of haemorrhage, infarction or infective aetiology identified.

Discussion:

Wasp venom contains several physiologically active compounds. It contains phospholipase A, B; hyaluronidase, histamine, mastoparan peptide which releases histamine from mast cells, acetylcholine and bradykinin like peptides. These have haemolytic and cytotoxic properties. Most deaths related to Hymenoptera stinas are the result of immediate hypersensitivity reactions causing anaphylaxis. Three maior reactions occur after [3] envenomation. The first is local swelling and irritation, which is produced by vasoactive components of the venom. The second is a generalized anaphylactic response with urticaria, angioedema, dyspnoea and hypotension. These more extensive reactions are caused by an immediate hypersensitivity reaction. The third reaction is serum-sickness-like symptoms including thrombocytopenia, DIC, haemolysis, rhabdomyolysis and acute renal failure.

lt is possibly mediated through circulating immune complex or delaved hypersensitivity reaction. [4] However, apart from immediate hypersensitivity; there have been reports of direct toxicity of wasp venom, especially in mass envenomations. Unusual hymenoptera sting reactions reported earlier include peripheral neuritis, myasthenia gravis and Gullain barre syndrome, Parkinson's disease, acute tubular necrosis, myocardial infarction. diffuse alveolar haemorrhage, thrombocytopenic rhabdomyolysis, purpura, vasculitis, cataracts and optic neuritis. [5]

Renal failure due to wasp sting can occur through three different mechanisms. Firstly, renal ischemia may result from hypotension due to an anaphylactic reaction to wasp sting .Secondly, toxin induced haemolysis can lead to hemoglobinuria, pigment deposition in renal tubules and renal failure. Thirdly, direct action of the venom on renal tubules also causes acute interstitial nephritis and acute tubular necrosis. [6, 7, 8] Thiruventhiran T et al from Malaysia have reported acute tubular necrosis following rhabdomyolysis in a patient with wasp bite. [6] Ghosh et al have reported a case of delayed interstitial nephritis following wasp sting. [7] Pramanik S and Banerji S also reported a case of toxin induced rhabdomvolvsis in a child with multiple wasp envenomations. [8]

Massive envenomations can cause death in non-allergic individuals. Elderly and children are at increased risk. [9] Mass envenomations occur when stinging insects respond to a human intruder as a threat to their colony. Our patient, an elderly farmer, while working in his farm land was stung by a swarm of wasps, when stones thrown by children at a wasp hive infuriated them and he became the victim. As he was bare chested at that time, he was repeatedly stung on the scalp, face and trunk by several wasps.

He received first aid at a local hospital where antihistaminic injection was given. The massive envenomations probably lead to hyperglycaemia, severe acidosis, acute renal failure, hypoxia, hypokalemia and hypoxia induced seizures. There are several interesting features in this case. This elderly individual was unaware of diabetes and coronary artery disease in him and was asymptomatic till he was stung by the wasps. The accelerated chain of events up to death of the patient was triggered by wasp venom.

Histopathological examination of the kidneys revealed that the patient had acute tubular necrosis, most possibly due to venom toxicity. It leads to acute renal failure over preexisting chronic kidney disease, which was confirmed by bilaterally shrunken kidney, alomerulosclerosis and interstitial fibrosis. Changes attributable to diabetes and benign hypertension were seen; the presence of fibrous crescents also indicated significant past renal parenchymal injury. He had atherosclerotic coronaries with partially obstructed lumen leading to the ischemic changes as noted on ECG. The left ventricular hypertrophy and hypertrophy of the papillary muscles is also attributed to long standing cardiac problem and totally unrelated to envenomations.

Hyperglycaemia may be stress induced and hypoxia resulted from the severe acidosis complicating the acute renal failure. Sudden cardiac arrest was the result of all these complications.

We have tried to highlight the rapid worsening of symptoms after massive envenomations in this elderly male with undiagnosed diabetes, atherosclerotic heart disease and end stage kidney disease. Special effort may be needed in treating elderly individuals with known or unknown pre-existent co morbidities, as wasp sting, especially massive envenomations, can act as a stressor and these individuals may succumb to acute complications despite an uneventful past.

Conclusion & Suggestions:

There is an age old adage 'Prevention is always better cure' which is aptly applicable to hymenoptera stings also. Always try to avoid or prevent a situation where these insects get infuriated by human intrusion into their hives. People of all age group and especially children should be educated not to pelt stones at insect hives or come too close to it. Knowingly or unknowingly if any such situation arises, then the best possible cure or remedy is to run away from the place as fast as possible because this insect swarm usually don't attack beyond their own area.

Wasp envenomations in elderly individuals with pre-existent diabetes and coronary artery disease can precipitate acute renal failure and metabolic acidosis. Such patients should be closely observed for 24 hours in the emergency services in order to institute early corrective measures to counter renal failure. However, larger series of such patients need to be studied to establish the treatment guidelines.

Acknowledgement:

We acknowledge the help of Dr. MJE Ambroise, Professor; Dr. G Manigandan, Junior Resident; Dr. S Peranantham, Junior Resident, Department of Forensic Medicine & Toxicology, JIPMER, Puducherry and also Dr. NG Rajesh, Assistant Professor; Dr. Sreeya Das, Senior Resident, Department of Pathology, JIPMER, Puducherry during the preparation of the above manuscript.

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Fig. 1: Thickening of the wall of the left ventricle with papillary muscle thickening



Fig. 2: Multiple atheromatous plaques of varying sizes in the lumen of the aorta



Fig. 5: End stage renal disease (PASx100)



Fig. 3: Hyalinised atheromatous plaque from left anterior descending artery with partial luminal obstruction. (H&Ex100)



Fig. 4: ESRD; several glomeruli are globally sclerosed and some show nodular glomerulosclerosis, tubules show atrophy, interstitium shows lymphocytic infiltrate and blood vessels show changes of benign nephrosclerosis. (H&Ex100)



Fig. 6: Kidney- Acute Tubular Necrosis (H&Ex100)



Fetish in Medical College

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Abstract

Fetishism means Recurrent, intense sexual arousing fantasies, sexual urges or behavior involving use of nonliving object over a period of six months, (e.g. female undergarments). The fantasies, sexual urges, or behaviors cause clinically significant distress or impairment in social, occupational or other important areas of functioning. One such case was reported at Govt. Medical College, here clothes of female doctors, female staff were being stolen since seven to eight months. One afternoon a seventeen year old (adolescent age) boy was caught with female undergarments in his hand. Fetishism mostly begins at the adolescent age. If proper guidance and sex education is given to adolescent age group regarding sexual disorders and crime related to it, such conversion into criminal behavior can be avoided in this fragile adolescent's age group. Thus familial, social, occupational functioning of an individual can be improved. In developing countries like India awareness is required regarding sexual offences, so that by carrying out interventions at early stages further complications and crime rate related to it can be minimized.

Key Words: Fetishism, Female Undergarments, Adolescent Age, Fantasies, Sexual disorders

Introduction:

Binet (1888), however, first gave the term "fetishism" its sexual connotation, defining it as the erotic idolatry of something which cannot directly satisfy the ends of reproduction. He stressed that everyone was to some extent a sexual fetishist and that the difficulty was in knowing where the normal became abnormal. [1]

Krafft-Ebing (1939) accepted Binet's conclusion that in connection with the first awakening of the fetishist's sexual life some event determined the association of lustful feeling with a single impression. The fetishist's abnormality according to Krafft-Ebing lies not in what stimulates him, but in what does not stimulate him-that is, in his limited sex interest. He classifies fetishes according to the type of fetish object:

(1) Part of female body, (2) part of female clothing, (3) special materials, (4) animals.

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Group 1 may be physiological or pathological, but the other three are always pathological. [2] It has been hypothesized that the selection of a fetish involves conditioning or learned behavior and requires a strong stimulus for it to register. [3] It is almost exclusively seen in males and most common in adolescent age group. [4] It is harmless but it may drive person to obtain fetish object through violence, or other criminal act, e.g., object may be stolen, or women may be attacked as a part of robbery with violence, or because the fetish provides the trigger for rape or indecent assault. [5] Such cases are common in upper classes in western countries, but present case belongs to lower socioeconomic status.

In developing countries like India there are many unnoticed cases of paraphilias. Very few are aware about such disorders hence never sought advice from psychiatrist by self as well as by their relatives. The following case was accidentally detected while a thief was caught red handed in campus.

Diagnostic Statistical Manual of Mental Disorders IV: [6]

- **Perversions (Paraphilias):**
- A. Requiring Partner :
 - Paedophilia
 - Sadism
 - Masochism
 - Frouterism
- B. Not Requiring Partner
 - Voyeurism

Exhibitionism

C. Requiring Some Object

- Fetishism
- Transvestism
- D. Excessive Sexual Drive
 - Satyriasis
 - Nymphomania

Case Report:

One such case reported at P.G hostel situated on 3^{rd} floor of hospital building of Govt. Medical College. The female doctors and Staff complaints that the clothes kept for drying in corridor were being stolen since 07 - 08 months. After keeping close watch by guards on Hostel a person of 17 yrs of age was rushing towards a room on 2^{nd} floor with female clothes in his hands. He was caught & on enquiry, he committed that he was illegally residing in that room on 2^{nd} floor since 09 months. The moment door was opened scene was as per (Picture 1)

- The wall opposite door contains, **female underwear's** arranged in **chronological order**, and few salwar kameez with brassiere beneath them were hanged. (Picture 2)
- Exhibition of female artificial jewellery with some photographs of Bollywood actress (Picture 3)
- Wall on side of the door contains yellow gown hanged as if like female is standing. (Picture. 4)
- Bathroom contains photographs of female on undergarments & short dresses, few female undergarments were also hanging on window of bathroom. (Picture 5)

As per history given by I.P.D patient's relative & staff of hospital, the boy use to roam in wards wearing **APRON** and use to ausculcate **ONLY FEMALE** patients and behaves as if he is medical student.

At the time of interrogation of Police he committed that he had stolen 03 mobiles, cash of Rs.3000/-,female garments (undergarments) from Ladies wing of Resident Hostel & Hospital staff, after coming back to room he use to SMELL them & MASTURBATE in bathroom. He also carried such thefts outside campus, generally he use to follow females, get their residential address & steal their undergarments in afternoon hours while they were kept for drying purpose in galleries of house then fulfill his desires.

Personal & Family History:

To the best of patients memory sexual excitement begins at age of 13yrs, when he come across Pornographic magazine via friend & felt stimulated by partially nude women wearing panties and carried out his first ejaculation via masturbation.

He dropped his school at age of 15 yrs (IXth class) left his village come to the city for earning his livelihood. Here he work at tea shop, but his most of earning & time spent on watching pornographic movies & magazines. He left job in few months & started helping his friend to steal things by keeping watch on houses. At same time he started stealing female undergarments from the houses they broke into, later on he use to follow female, trace their addresses & fulfill his desire after stealing undergarments.

Forensic Psychiatry:

Forensic psychiatry is the branch of psychiatry that makes determinations, as regarding fitness, to stand trial the need for commitment, or responsibility for criminal behavior, in a court of law, [8] Focuses on the concept of paraphiliac impulse as a persistent, compulsive and an irresistible power preventing an individual from feeling morally guilty during the act by adversely affecting one's will to control him/herself and leading to impairment of persons familial, social, occupational functioning. This makes it quite impossible for the individual to logically think about the consequences of the act. Only after the act is completed she/he does fully realize that it is legally and morally forbidden. Despite feeling regretful, ashamed and distressed, she/he cannot help but repeat the crime. [9]

Conclusion and Recommendations:

- 1. Paraphilias can range from nearly normal behavior to behavior that is destructive or hurtful only to a person's self or partner, and finally to behavior that is deemed, destructive or threatening to the community at large.
- 2. Fetishism mostly begins at the adolescent age.
- 3. If proper guidance and sex education is given to **adolescent age group** regarding sexual disorders and crime related to it, such conversion into **criminal behavior** can be **avoided** in this fragile **adolescent's age group**. Thus familial, social, occupational functioning of an individual can be improved.
- 4. In developing countries like India awareness is required regarding sexual offences, so that by carrying out interventions at early stages further complications and crime rate related to it can be minimized.

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Picture 1: Scene of the Room



Picture 2: Female Underwear's arranged in Chronological Order on the wall



Picture 3: Exhibition of Female Artificial Jewellery with Photographs of Bollywood Actress



Picture 4: Yellow Gown Hanged on the Wall



Picture 5: Photographs of Females in Undergarments in Bathroom

