

Journal of Indian Academy of Forensic Medicine (JIAFM)

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Dr. Mukesh Yadav

From Editor's Desk

I feel immense pleasure to present before you the fourth issue of JIAFM 2007. 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. On behalf of Executive Committee of IAFM for the years 2006-2008 I took resolution to further improve the quality and status of our Journal. We always learn from mistakes and try to improve upon these.

Journal, Indian Academy of Forensic Medicine

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Editorial

Role of Mandatory HIV Testing

HIV testing carried out on a voluntary basis with appropriate pre and post-test counseling is considered to be a better strategy and is in line with WHO Guidelines on HIV testing. The basis and objectives of testing are to:

- Monitor the trend of HIV infection in a population
- Test blood or organs or tissue for ensuring safety of the recipients, and
- Identify an individual with HIV infection for diagnosis or voluntary testing purposes.

There is an active debate in the India on the issue as to whether there should be mandatory testing of persons suspecting of carrying HIV infection. Considerable thought has been given to this issue. Testing for HIV is more than a mere biological test for it involves ethical, human and legal dimensions. The Central Government feels there is no public health rationale for mandatory testing of a person for HIV/AIDS. On the other hand, such an approach could be counterproductive as it may scare a large number of suspected cases from getting detected and counseled to take appropriate measure to improve his quality of life and prevent spread of infection to other persons in the community. HIV testing carried out on voluntary basis with appropriate pre and post-test counseling is considered to be a better strategy and is in line with the national policy on HIV testing and also the WHO Guidelines.

HIV testing should be a part of overall comprehensive preventive and promotive programme.

Testing by itself does not result in behavioural changes that restrict transmission of HIV to others and therefore, testing should be a part of total control programme which is conducive for behavioural change of the individual by providing social support, means and skill to reduce or eliminated risk behaviour.

Testing without explicit 'consent' of the patients i.e. mandatory testing has proved to be counterproductive in the long runs in the control of HIV epidemic. Social support and intervention must be directed to anybody vulnerable to risk behaviour irrespective of whether an individual or group participates in testing procedure or not. Otherwise such testing can drive the target people underground and make it more difficult for launching intervention.

Any health programme which does not maintain the dignity of the patient or deprives him of his basic right to employment or access to medical care or social support is harmful on a long term basis.

The question which must be asked before a testing procedure is undertaken is how this result will be used for the benefit of the individual or of the community; if there is a policy and means to support the group under testing following the test result; and does the test same principle of intervention apply even if people refuse testing?

Positive answer to all the above questions is prerequisite for testing to be an effective tool.

HIV testing procedure for research is designed according to specific objectives and could be decided by the researcher. However, all the studies undertaken must follow ethical standards which primarily involves full explicit consent of the patient and pre-decided and mutually agreed terms for any eventuality of the patient due to research activities.

Government of India has already issued a comprehensive HIV testing policy and following issues are reiterated here:

- No individual should be made to undergo a mandatory HIV testing
- No mandatory HIV testing should be imposed as a precondition for employment for providing health care facilities during employment.
- Adequate voluntary testing facilities with pre-testing and post testing counseling should be made available through out the country in phased manner. There should be at least one HIV testing centre in each district of the country for voluntary testing in the Government Sector.

No citizen will be forced to undergo an HIV test; the Centre has told the Supreme Court putting an end to the debate on making such tests mandatory. The centre said in response to a court notice in a case where the Andhra Pradesh Government had denied promotion to an HIV- Positive Constable. The High Court had quashed the State's decision. Aware of the effect of such a decision on lakhs of government officials, the apex court had sought response from the Centre to the question on "whether a person found HIV+ could be considered for appointment as sub-inspector of police in contravention of the recruitment rules".

The Union Health Ministry, in its affidavit, said it was aware of the active debate in the country on the issue of mandatory testing of people suspected of carrying HIV infection.

Refusing to side with those canvassing for a mandatory test, the ministry said such an approach could be counter-productive as it may scare away a large number of suspected cases from getting detected and treated.

The ministry said it was wrong to deny employment or promotion to anyone just because he had tested positive for HIV- positive persons should be guaranteed equal rights to education and employment as other members of the society".

HIV status of a person should be kept confidential and should not in any way affect his right to employment, position at workplace, marital relationship and other fundamental rights, the ministry said.

The Centre's National AIDS Prevention and Control Policy unequivocally said there should be no discrimination in matters of employment to an HIV positive person and that they should be guaranteed rights enjoyed by other members of society.

The Constable had approached the Andhra Pradesh Administrative Tribunal, saying that though he cleared the written tests and was provisionally selected for the post of Sub-Inspector, he was denied the promotion only because he tested positive for HIV.

The Tribunal had rejected his claim going strictly by the Andhra Pradesh Revised Police Manual, which prohibited entry of persons who are HIV- positive into government service. He appealed before the Andhra Pradesh High Court, which had allowed his claim.

Mukesh Yadav

Profile of near drowning victims in a coastal region of Karnataka

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TOTAL NUMBER OF TABLES= 1 [ONE]

FIGURES= 2 [TWO]

Abstract

BACKGROUND: Drowning and near drowning are serious public health problems and an important cause of morbidity and mortality worldwide. Present study is done to understand the pattern of near drowning cases in this coastal region of Karnataka. **METHODS:** This hospital based retrospective research was conducted at Kasturba Hospital, Manipal in Southern India from January 1993 to December 2003. A detailed victimologic profile was made. **RESULTS:** Study included a total of 58 cases of near drowning. Males were predominantly affected (84.5%). Majority of the victims were aged below 10 years (39.7%). Manner was accidental in maximum (82.3%) reported cases. Incidence of fresh water drowning was more than sea water drowning. Fatal outcome was reported in 12.1% cases with maximum fatalities occurring within one to three days of hospitalization. Most of the victims witnessed respiratory complications (55.2%). **CONCLUSION:** Males in the first decade are at increased risk of accidental drowning. Swimming under adult supervision, immediate resuscitative measures and early medical aid is proposed.

Keywords: Drowning; Near Drowning; Accident; Mortality.

Introduction:

Drowning is a process resulting from submersion in water or any other liquid in which there is loss of consciousness and threat to life [1]. When the victim shows an apparent initial recovery from drowning but then dies hours or days after the incident owing to complications it is termed as secondary drowning [2]. Near drowning refers to submersion cases when the victim survives for at least 24 hours after the event [3]. People have reportedly drowned in as little as 30mm of water lying face down. Children have drowned in baths, buckets and toilets; those under the influence of alcohol or drugs have died in puddles. The rate of drowning in populations around the world varies widely according to their access to water, the climate and the national swimming culture. The United Kingdom suffers 450 drowning per annum or 1 per 150,000 of population whereas; the United States suffers 6,500 drowning or around

1 per 50,000 of population. The rate of near drowning incidents is however, unknown.

Manipal is a rural township in Udupi district of coastal Karnataka situated in Southern India, and Kasturba Hospital is the apex teaching hospital of Kasturba Medical College, Manipal. This retrospective hospital based research is done with an aim to determine pattern of near drowning, circumstances and location of drowning, and complications that developed during the hospital stay to understand the problem status of near drowning in this coastal part of the country and suggest preventive measures.

Material and Methods:

This eleven year retrospective review was carried out at Kasturba Hospital, Manipal. Hospital records of all the drowning cases admitted in our hospital between January 1993 and December 2003 were studied and a detailed victimologic profile was made.

The data was registered in a database and in addition to age and sex, was analysed for circumstances, location of drowning, and complications that developed during the hospital stay. Victims who survived for less than 24 hours following drowning were excluded from the study.

Results:

A total of 58 cases of near drowning were admitted in Kasturba Hospital, Manipal during January 1993 and December 2003. Majority of the victims (n= 49, 84.5%) were males, male-female ratio being 5.4:1. Peak incidence is observed during 1st decade of life, after which a gradual decline was evident. 1st and 2nd decades together accounted for 58.6% (n=34) of the total near drowning cases (Figure 1). Manner of near drowning was accidental in 82.3% (n=48) and suicidal in 10.3% (n=6) cases. Exact manner of death remained unknown in four cases. No homicidal near drowning was reported during the study period. Place of incident and media of submersion was known in 94.8% (n=55) cases, of which maximum (n=38, 69.1%) were cases of fresh water drowning (Figure 2). Duration of hospital stay is shown in table 1. Respiratory complications were encountered in maximum number of cases (n=32) followed by neurological complications (n=12). In nine victims (15.5%) no complications were reported while seven victims (12.1%) died in the hospital. Period of survival in fatal cases varied from 2 -18 days.

Discussion:

According to the Global Burden of Disease (GBD) 2000, an estimated 449,000 people drowned worldwide and a further 1.3 million Disability Adjusted Life Years were lost as a result of premature death or disability from drowning. Low and Middle- income countries have the highest rate of drowning [4]. Near drowning is the survival of a drowning event involving unconsciousness or water inhalation and can lead to serious secondary complications, including death, after the event.

Our study of near drowning cases shows that males are more likely to drown than females, especially during the first decade of life, similar to other studies [5]. Paden et al. have reported a higher drowning mortality rate in males than females for all ages in all regions and a higher mortality rate when compared to any other cause of injury worldwide in children under the age of 15 years [4]. 1st and 2nd decade together accounted for more than half of the total near drowning cases. Young children are at greatest risk of near drowning owing to their energy and curiosity that can easily lead them to fall into water source from which they cannot escape. In teenagers and adults however, near drowning has been

associated with drugs and intoxication, seizures, and physical impairment because of a medical condition [6]. Unintentional drowning was reported in maximum cases similar to studies worldwide. Victims of accidental drowning are usually children, fisherman, and dock workers, intoxicated or epileptic subjects. Suicidal episodes are fairly common amongst women or disabled persons, while homicides are rare except in cases of infants, children & disabled persons [7]. In our study no homicidal case of near drowning was reported. In the US causes of drowning are related to swimming, boating, and scuba diving. Suicidal drowning was seen in about 10% of the drowning cases. Drowning remains a relatively popular method of suicide in this region [8]. Fresh water drowning was more commonly encountered with drowning in pond and wells predominating similar to a study in neighbouring coastal region [9]. In a similar study in coastal region of Florida fatal accidental drowning in salt water was most common [10]. World wide most drowning incidents occur in water, 90% in freshwater (rivers and lakes) and 10% in sea water, drowning in other fluids are rare and usually be accidental. Near drowning is characterized by severe oxygen deprivation caused by submersion in water when the person survives. Water enters the lungs when a person is submerged under water. Thus, the lungs cannot efficiently transfer oxygen to the blood. The decrease in the level of oxygen in the blood that results may lead to brain damage and death. Water contaminated by bacteria, algae, sand, dirt, chemicals, or a person's vomit, can cause lung injury in addition. People who are rescued are reported to have symptoms ranging from anxiety to near death. The original concept of drowning deaths was that they were asphyxial in nature with water occluding the airways. Experiments by Swann & coworkers suggested that death was due to electrolyte disturbance and / or cardiac arrhythmias, produced by large volume of water entering the circulation through lungs. Model suggested that about 10 % of drowning victims do not aspirate water but die of asphyxia due to laryngospasm. In our study respiratory complications were encountered in maximum number of cases followed by neurological complications. Electrolyte imbalance in these cases of near drowning is a topic of future research.

In nine victims, no complications were reported while seven victims died in the hospital. Period of survival in fatal cases varied from 2 -18 days. The chances of survival depend on the duration of submersion, the water temperature, the person's age, and how soon resuscitation begins. People who have consumed alcoholic beverages before submersion are more prone to develop brain or lung damage.

Survival is possible after submersion for as long as 40 minutes. Almost all people who are alert and conscious upon their arrival at the hospital recover fully.

Conclusion and recommendations:

Accidental drowning is largely preventable and males below 10 years of age form the high risk group. The quality of information available needs to be improved especially with regard to disease status and alcohol intoxication among the victims.

The reduction of drowning through education should become a significant element of school curricula. Swimming pools should be adequately fenced. Constant supervision of children in or near any source of water, including pools and bathtubs is recommended. A person should not engage in swimming or boating when under the influence of alcohol or sedatives. People who have seizures should be cautious near water source. To decrease the risk of drowning, a person should avoid swimming alone.

Immediate on-site resuscitation is the key in increasing the chances of survival without brain damage and thus recommended. Attempts should be made to revive the person even when the time under water is prolonged. Artificial respiration and CPR should be provided and immediate transfer to hospital is sought.

Figure 1: Age distribution of victims

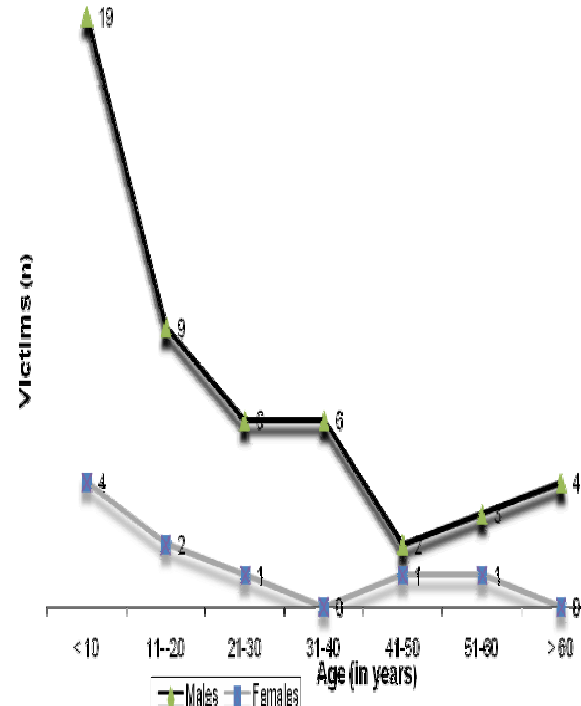
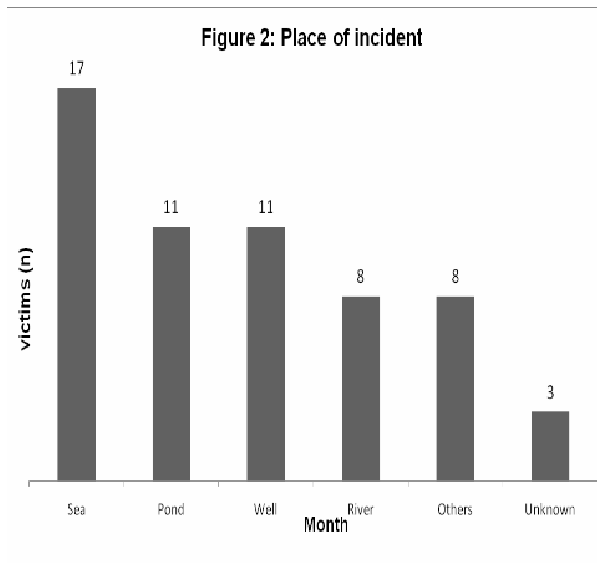


Table 1: Duration of hospital stay

Hospitalisation (days)	No. of cases (n)	Percentage (%)
> 1- 2	15	25.9
> 2- 3	10	17.2
> 3- 4	07	12.1
> 4- 5	08	13.8
> 5- 7	06	10.3
> 7- 30	11	18.9
> 30	01	1.7
Total	58	100



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References:

A Review of Pedestrian Traffic Fatalities

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Abstract

Pedestrians injured in automobile accidents constitute one of the most frequent serious problems in management for emergency room surgeons. The incidence of deaths in pedestrians is significantly higher than in other road users. This study attempted to analyse the pattern of injuries sustained by 129 pedestrians in road traffic accidents. It was found that the pedestrians were the commonest group of victims involved in fatal road accidents comprising 28.7% of all cases. 83.7% cases were males. There were two peaks of incidence in relation to age; one at childhood (20.9%) and the other in elderly (19.37%). Cars and heavy vehicles were the commonest offending agents comprising 41.9% and 31.8% respectively. The pedestrians themselves were at fault in 43.4% cases. Head injury was seen in 80% cases; followed by lower limb fractures (42.6%), and chest injury (38.8%). The cause of death was head injury in 56.6% cases followed by thoraco-abdominal injuries in 8.5% cases and multiple injuries in 7.8% cases.

Key Words: Road Traffic Accidents, Pedestrians, injuries.

Introduction:

Pedestrians are the common road users in India. With increasing traffic on roads has lead to major fatalities of pedestrians. The incidence of death in pedestrians is significantly higher then in car occupants or motor cyclists in road accidents which are further increasing at an alarming rate. Road side accidents constitute one of the most frequent serious problems in management for emergency room surgeons. Since pedestrian deaths are one of the leading causes of our country an attempt is

made to study the pattern of injury by examining dead victims.

Material and Methods:

Material for the study consisted of 129 pedestrian death victims over a period of one year. Out of total 450 accident victims, 129 were pedestrians. In all these cases detailed information was recorded from relatives, police inquest papers, hospital records and eye witnesses. Detailed post-mortem examination was carried out to record external and internal injuries. The data thus obtained was analysed.

Result:

The pedestrians were the commonest group of victims involved in fatal accidents comprising 129 cases (28.7%) out of total 450 cases. Out of 129 pedestrians 108 (83.7%) were males and 21 (16.3%) were females.

Table No 1
Age and Sex Distribution

Age group (in years)	Pedestrians	
	Male	Female
0-10	21 (19.4)	6(28.6)
11-20	18(16.7)	1 (4.8)
21-30	16(14.8)	2(9.5)
31-40	18(16.7)	0(0)
41-50	10(9.3)	4(19.0)
51-60	10(9.3)	4(19.0)
61-70	13(12.0)	4(19.0)
71-80	1 (0.9)	0(0)
81-90	1 (0.9)	0(0)
91-100	0(0)	0(0)
Total	108	21

In age distribution there were two peaks of incidence in pedestrians, one at the childhood (20.9 %) and another for elderly (19.37%).

Table No. 2
Time of Occurrence

	6 8AM	8 10AM	10AM 12N	12N 2PM	2 4PM	4 6PM	6 8PM	8 10PM	10PM 12MN	12MN 2AM	2 4AM	4 6AM	Total cases
Pedestrians	9(18.6)	24(18.6)	13(10.1)	19(14.7)	13(10.1)	12(9.3)	18(14)	7(5.3)	2(1.6)	1(0.8)	3(2.3)	8(6.2)	129

According to time of occurrence majority of pedestrians fatalities occurred at 8 – 10 A.M. (28 Cases), 12 -2 P.M. (19 cases) and 6-8 P.M. (18 Cases) .During these accidents pedestrians were at fault themselves in 56 (43.4%) cases. The Pedestrians were hit by car and jeeps in 54 (41.8%) cases and heavy vehicles in 41 (31.7%) cases.

Table No. 3
Time Required to Reach Hospital

Time required to reach hospital	Pedestrians
15 min	9(7)
15-30 min	22(17)
30-45 min	27(20.9)
45-60 min	16(12.4)
1-1.5hrs	20(15.5)
1.5-2 hrs	9(7)
2-2.5 hrs	8(6.2)
2.5-3 hrs	1(0.8)
>3 hrs	3(2.3)
Spot deaths	14(10.9)
Total cases	129

Majority of victims reached hospital in 30-45 minutes after accidents (27Cases) followed by 15-30 minutes (22 Cases) and 20 cases reached hospital in 1-1.5 hours. None of the victims received any treatment or first aid at the site of accidents.

Table No. 4
Survival Period

Survival period	Pedestrians
0-0.5 hr	40(31.1)
0.5-1 hrs	1(0.8)
1-6 hrs	29(22.5)
6-12 hrs	11 (8.5)
12-24 hrs	7(5.4)
24-48 hrs	6(4.7)
48-72 hrs	4(3.1)
3-5 days	11 (8.5)
5-7 days	4(3.1)
7-14 days	11 (8.5)
>14 days	5(3.8)
Total cases	129

The greatest proportion of deaths occurred in first half an hour after accidents (40Cases) another 29 cases died with in 1-6 hours of admission to hospital.

Table No. 5
Cumulative percentage of dead by various times after accidents

Deaths within	Pedestrians %
0.5 hours	31.1
1 hours	31.9
6 hours	54.4
12 hours	62.9
24 hours	68.3
48 hours	73.0
72 hours	76.1
5 days	84.6
7 days	87.7
14 days	96.2

Shows cumulative percentage of dead by various times after accident. All together half of the victims died with in 6 hours, Two Third by 24 hours, Three Fourth by 72 hours and 96.2 % by two weeks.

Table No. 6
Major Regional Injuries

Regional injuries		Pedestrians
I. Head injury		
(a)	Fracture skull and face	98(76)
(b)	Subdural haematoma	68(52.7)
	Subarachnoid haemorrhage	55(42.6)
	Extradural haematoma	35(27.1)
	Intracranial bleed	11 (8.5)
(c)	Brain injury	0(0)
(d)	Herniation and brain compression	33(25.6)
III. Chest injury		
		65(50.4)
(a)	Fracture ribs	36(27.9)
(b)	Fracture sternum	5(3.9)
(c)	Lung	27(20.9)
(d)	Heart	6(4.7)
(e)	Diaphragm	3(2.3)
IV. Abdominal injury		
		33(25.6)
(a)	Liver	24(18.6)
(b)	Spleen	13(10.1)
(c)	Kidney	4(3.1)

(d)	Bladder	5(3.9)
(e)	Gut	8(6.2)
II. Cervical spine injury		14(10.8)
V. Upper limbs		33(25.6)
(a)	Fracture humerus	15(11.6)
(b)	Fracture BBF	18(14.0)
VI. Lower limbs		67(51.9)
(a)	Fracture femur	35(27.1)
(b)	Fracture BBL	20(15.5)
(c)	Fracture pelvic bones	12(9.0)
Total cases		129

A total of 310 major injuries were seen in 129 cases, injury per case being 2.4.

Table No. 7
Fatal Injuries

Fatal injury(s)	Pedestrians
Head injury	73(56.6)
Cervical spine injury	2(1.6)
Chest injury	3(2.3)
Abdominopelvic injury	9(6.9)
Head and chest injury	8(6.2)
Thoracoabdominal injury	11 (8.5)
Head and abdominal injury	3(2.3)
Limb and fracture	10(7.8)
Multiple injuries	10(7.8)
Total cases	129

Head injury alone was fatal in 73 (56.6%) cases, Thoraco-abdominal injury in 11 (8.5%) cases, lower limb fractures and multiple injuries in 10 cases (7.8%) each. The victims who died on spot had fracture of skull, laceration of brain, rupture of liver and lungs. Similar trend was seen in early deaths on admission. Those surviving for more than 24 hours, injury to brain and vital organs decreased and incidence of SDH and Herniation of brain increased. In victims surviving for 7-14 days, SDH and herniation of brain or multiple fractures of lower limbs were seen.

Discussion:

Pedestrians were the commonest group of victims involved in fatal road accidents comprising 28.7% of all cases. These statistics are particularly disturbing in view of the fact that, while walking is in general, the most pollution free, healthy and safe mode of travel, those who venture on foot proceed at great risk. This fact is because the pedestrians are the most common road users but

are not segregated from the high speed vehicles. Similar observations were made by Sevitt [1], Chandra et al [2], Galloway and Patel [3], Srivastava [4], Maheshwari and Mohan [5], Tirpude et al [6]. The common offending vehicles were cars and jeeps and heavy vehicles as also reported by Chandra et al [2] and Tirpude [6]. Pedestrians were themselves at fault in 56 cases which is in concurrence with study of Srivastava [4]. Multiple injuries were a rule in pedestrian's fatalities. Injury per case being 2.4 which is in accordance with study of Ghosh [7], Maccerol [8], Sevitt [1], Tirpude [6], Gissane [9]. Head injury alone was fatal in majority of cases followed by multiple and thoraco-abdominal injuries as observed by Sevitt [1], Chandra et al [2], Ghosh [7], Tirpude [6]. Delay in transporting the victims to nearest hospital was due to lack of initiative, no mobile vans or police patrol to aid in transport which is in concurrence with study of Maheshwari and Mohan [5]. The majority of deaths occurred in first half an hour and then 1-6 hours after admission to hospital. These early deaths were due to severe brain injury and laceration of liver and lungs. In victims surviving longer lower limb fractures and cerebral compression accounted for death. Similar observations were made by Sevitt [1], Chandra et al [2] and Srivastava [4].

Conclusion:

The present study shows that pedestrians are the commonest road user killed in road accidents and these mainly comprise of Children and elderly victims. So specific steps should be taken to prevent these fatalities like:

1. Complete segregation of pedestrians from the highways.
2. Zebra crossings and subways should be constructed at appropriate places.
3. Children should be educated about traffic rules and proper care while crossing roads.
4. Speed limits should be strictly implemented near populated areas, residential colonies and schools.
5. Proper street lighting and traffic lights at busy cross roads.
6. Care of the injured at road site is must with provisions for quick transport of injured person to nearest hospital.

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Post-mortem diagnosis of Gestation Choriocarcinoma –A Case Report

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Abstract

The present case demonstrates how a clinico-pathological approach of a forensic pathologist played a key role in deciding a sudden suspicious death and also highlights the characteristics of gestational choriocarcinoma and its importance's in post mortem diagnosis among the forensic experts and clinicians. Investigating authorities were curious in knowing whether the death was due to criminal abortion or suicidal consumption of poisoning. The case was unraveled so that the rested soul is given justice and free from all defames.

Key Words: Gestation Choriocarcinoma, Autopsy, ileal and Liver metastasis, Histopathology.

1. Introduction:

Gestational trophoblastic disease also called as choriocarcinoma is a malignant trophoblastic tumour arising from any gestational event during pregnancy in the reproductive age group. It is a quick growing form of cancer that occurs in a woman's uterus after a pregnancy, miscarriage, or abortion which usually metastasises to other places in the body. Women with gestational choriocarcinoma may present with abnormal vaginal bleeding, persistent markedly elevated β hCG, or a history of prior pregnancy. Most patients develop gestational choriocarcinoma shortly after gestational anomalies, but pathology may occur after a long latency of years.

In this paper, we report a case of gestational choriocarcinoma diagnosed at Autopsy.

2. Case Report:

A 19 year old girl of an Indian origin with low socio-economic status succumbed sudden and suspiciously. The case was referred from a peripheral hospital with complaints of fever, pain abdomen of two weeks and vaginal discharge of one week. There was no history of amenorrhea but the previous cycles were irregular. The treating doctors suspected either criminal abortion, a common entity in rural India and suicidal consumption of poison to avoid social stigma. A diagnostic ultrasound was

conducted and revealed feature of missed abortion for which Dilatation and curettage (D&C) was done. The treating doctors however ruled out criminal abortion clinically were still unsure about consumption of poison. During admission she was pallor, jaundiced and her condition was critical with increased pain. Abdominal examination was tensed with tender hepatomegaly. On auscultation the bowel sounds were poorly heard. Abdomen radiographs was conducted and showed dilated bowel loops, ground glass appearance with air fluid level.

As an emergency measure, laprotomy was performed for bilateral twisted ovarian cyst. For surprise intra-operatively ileocaecal intussusception with multiple boggy bleeding swellings in the liver were diagnosed on the operative table. As a surgical treatment bilateral salphingo oophorectomy, ileal resection and anastomosis were done. The patient died after few hours of operation.

In view of a suspicion of foul play due to an unusual nature of her death, a postmortem examination was conducted at the District Wenlock Hospital, Mangalore, to shed light mainly to rule out criminal abortion, suicidal poisoning or any other medical or surgical cause of death.

On External findings the body was of an adult female moderately built and nourished, dark complexion measuring 145cms and weighs 35kgs. Sclera shows yellowish discolour and breast showed pigmentation of areola bilaterally with surgical wounds on abdomen.

The Internal Findings were Right and left Lungs weighed 300gms and 200gms respectively, congested, froth oozing on cut section. Heart weighs 280 gms with sub-endocardial hemorrhage, coronaries were patent. Abdomen contained 300ml of blood and 40gms of blood clots seen in peritoneum, two surgical swabs were seen in the cavity to arrest the bleeding sites from the surface of liver. Small Intestine showed surgical anastomosis. Large Intestine contains malena and fecal matter. Liver weighed 2170gms enlarged with hemorrhagic swellings all over the surfaces and in tissue parenchyma (Fig.1).



Fig-2, Cut section of liver with hemorrhagic nodules

The cut section shows blood clots with tissue destruction in hepatic parenchyma. Spleen weighed 80gms, soft with focal lesions on cut section. Right and Left Kidney each weighed 80gms and the cut section is pale cortex. Uterus weighs 140 gms, measures 9.5x5x2.5cms, tubes ligated on both sides cut sections were hemorrhagic with blood clots and remnants of ovaries. Still unclear with the cause of death, specimens from the tissues were sent for histopathological and toxicological review. Toxicological analysis for known causes of poisons and drugs showed negative. Pathological gross examinations of tissue specimens were done. Resected Intestinal segment (Fig.2)

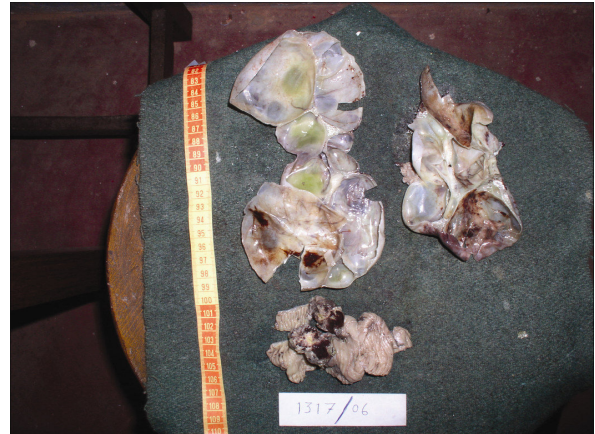


Fig-1, Cut section of ovarian cysts and ileal metastasis

in its luminal aspect showed a hemorrhagic polypoidal mass measuring 5X2 cms, cut surface of polypoidal mass was hemorrhagic brown with some white yellow areas. Liver measured 26X14X5 cms with capsule intact with dark red multiple hemorrhagic spots with partly nodular appearance. Cut surface of liver showed large necrotic foci of extensive hemorrhage. Spleen measured 12X4X2 cms, outer surface showed area of discoloration and cut surface showed white wedge shaped area. Uterus without adnexa weighed 140gms and measured 9.5X5X2.5 cms, endometrial cavity showed hemorrhagic surface. Fundus of uterus showed a brown hemorrhagic defect measuring 1.5 cms.

Histological studies showed liver and polypoidal mass of ileum with large aggregates and bilaminar pattern of cytotrophoblasts and syncytiotrophoblasts amidst extensive hemorrhage (Fig.3 & Fig.4).

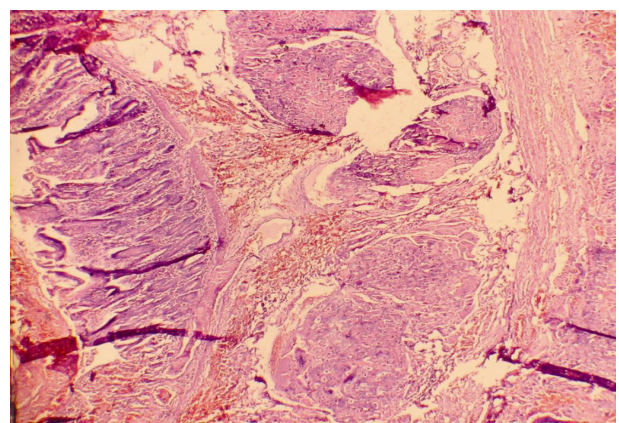


Fig. 3 Metastatic Choriocarcinoma in the wall of ileum [H & E stain Original Magnification X 40]

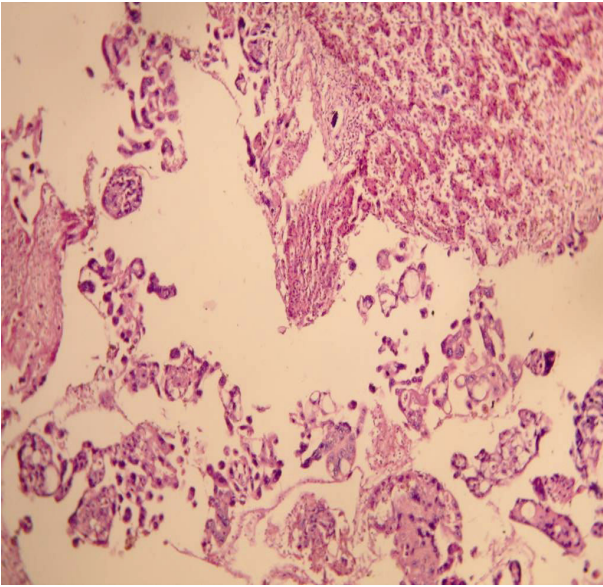


Fig. 4 Metastatic tumour cells in the liver parenchyma [H & E stain Original Magnification X 40]

No chorionic villi were seen. Uterine fundus revealed large focus of ischemic necrosis up to serosa. Endometrium and myometrium had areas of hemorrhage. Uterine specimen also showed an occasional syncytiotrophoblastic tumor cells amidst red cells. Bilateral ovarian masses revealed multiple theca lutein cysts with areas of inflammation and hemorrhage. Spleen showed ischemic necrosis with wedge shaped infarction. The Microscopic findings were suggestive of Choriocarcinoma of Uterus with secondary metastasis in liver, small bowel and spleen, a natural cause of death, which unraveled the cause of death.

3. Discussion:

Choriocarcinoma is the most aggressive form of gestation trophoblastic disease, which mostly occurs following a complete hydatiform mole, 1-2% of complete moles are followed by choriocarcinoma [1]. Villi are characteristically absent [1, 2]. In cases of untreated Choriocarcinoma it is characterised by the presence of early haematogenous metastasis to lung, brain liver, kidney and bowel [1,3,4,5] being the most common sites, which is an exception in this case as there was only involvement of liver, kidney, spleen, ileum and burnt out lesion in the uterus. Microscopically tumor is composed of clusters of cytotrophoblasts separated by streaming masses of syncytiotrophoblasts resulting in a characteristic

dimorphic plexiform pattern. Hemorrhage and necrosis are usually present [1, 6].

The presence of residual tumour in the uterus of patient dying of disseminated choriocarcinoma may be inconspicuous or altogether absent [1, 7] as in our case we found tumour cells in uterine scrapings as evidence of primary tumour.

A natural history of an untreated choriocarcinoma is characterized by development of early hematogenous metastasis as seen in developing countries like ours were the patient with low economic background rarely go for regular checkups.

The morphological changes seen in other organs in patients with choriocarcinoma are the result of increased secretion of β -hCG and other hormones by the tumour cells like hyperplasia of endocrinal glands, decidual reaction, Arias-stella phenomenon, bilateral enlargement of ovaries by theca luteal cysts and hyperplasia of mammary lobules. Detection of ovarian theca-lutein cysts long after a case of choriocarcinoma has been treated is usually a sign of persistent disease [1,7] but In this case bilateral enlargement of ovaries by theca luteal cysts and hyperplasia of mammary lobules and pigmentation around areola is seen however increased β - h CG levels were not detected.

4. Conclusion:

As illustrated in our case, the patient can succumb of Choriocarcinoma, as a sudden natural cause of death. Forensic pathologists should be aware of such an evolution. With an appropriate history and Clinico-pathological review such entities can be considered in cases of sudden death.

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Human Organ Trade: Is enough being done?

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Abstract

In recent times, instances of illegal organ transplants are on a rise. Despite of strict regulations doctors, donors, middlemen and hospitals are indulging frequently in organ trade. Any organ transplant, if not done in accordance with transplantation of human organ act, 1994 is considered illegal in Indian law. The act permits any registered medical practitioner to transplant human organs for therapeutic purpose without any motive of financial gains, neither to the doctor not to the donor. Such procedures can be done by permission of appropriate authorization committee in any hospital, authorized by law for the purpose. Any adult healthy person can volunteer to donate tissues from his body to any needy patient; such donations can be made during ones life time if they don't pose danger to ones life, after taking his consent or after his death (cadaveric donation) by permission of next of kin. If no consent (living will) is present, then also the legal possessors of body can allow removal, if they don't have any reason to believe deceased's refusal for the same. In hospital deaths, if bodies are unclaimed for 48hrs after death then hospital can dispose the body and use the organs as directed by the deceased. Before certification of death proper diagnosis of brain stem death is to be made as per Harvard's criteria. Live donations are exclusively made, to save the life of a patient, preferably by a near relative as defined in the act. Unrelated donations are made in inevitable circumstances, on approval by appropriate authorization authority [1].

Any transplantation which is not in accordance with transplantation of human organ act is illegal and doctor, donor as well as recipient can be punished. Punishment can be imprisonment upto 5 years and fine upto Rs.10000/- or both. Whosoever, engages in commercial dealings in human organs is punished with imprisonment of 2-7 years and a fine of Rs.10000 to Rs.20000. When a doctor is convicted under the act, action is also taken by medical council. It can lead to temporary erasure of name from medical register for the 1st offence and penal erasure for subsequent one [1]. Unfortunately, even strict legislation has not deterred the offenders. Recent investigations made a shocking revelation of a village, Magadi in Bangalore rural area where people have been selling kidneys to pay their debts. This racket was traced extending to several nearby villages. Huge amount of money was being made by middle men depriving the donor of the sum assured [2].

Ignorance of law among donors, considerable monetary gains and feeling among offenders that they can easily get away from the law may be responsible for this growing menace. General awareness about the act among the masses is proposed along with a review of penal portion of the act and strict implementation of the provisions provided in the act to control illegal trade of human organs.

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Suspicious Deaths in Newly Married Females –A Medicolegal Analysis

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Abstract

A rapid increase in unnatural deaths in females, especially in the first few years of their married life was observed in our society for last few decades. This drew the attention of people and forced the socio-political system to investigate and develop preventive measures [1-3].

In this study most of the victims were young (18-22 years) Hindu females of middle or lower-middle socio-economic status living in a joint family with their husband & in-laws and died in suspicious circumstances within three years of their marriage.

Majority of such deaths were suicidal or homicidal. Burning was the most common cause of death, followed by hanging and poisoning. Few of them were strangled to death and then burned to temper the evidences. Pressure for dowry was the single largest reason behind such deaths. Ill-treatment by the in-laws, rash and negligent behavior or extra-marital affairs of husbands, and mal-adjustment in females were other important reasons.

Few of these deaths were also accidental, catching fire while cooking or handling open lamp/fire carelessly. Loose synthetic saris of the victims were responsible for large number of mortalities in this study.

Key Word: Dowry, Newly married female, Husband and in-laws, arranged marriage, burn.

Introduction:

The high incidence of unnatural deaths in newly married females within first few years of their marriage is a dark spot on the noble tradition of our society. The most obvious reason behind such deaths are unending demands of dowry (cash / kinds) by their husbands &/or in laws, for which they sometimes kill or torture the bride in such a way that she commits suicide [4].

Besides this, family quarrels due to ill-treatment by in-laws, rash & negligent behavior or extra marital affairs of husband and maladjustment & infertility in wives are other reasons behind such deaths. Burning is the most common cause of such deaths. Hanging, poisoning, strangulation or jumping from the terrace is also used by few to end the lives.

The present study deals with the epidemiological, social & medicolegal aspects of unnatural deaths in newly married females.

Materials and Methods:

The material for the present study comprises of all the cases of newly married females died within seven years of their marriage that were brought to District Mortuary Kanpur for post mortem examination during the period from Feb 2003 to Jan 2004. To concentrate more on unnatural deaths due to family problems, the women died due to mass casualties, road traffic accidents, natural deaths and unidentified bodies were not included in this study.

All the relevant information regarding epidemiological characteristic and their medicolegal aspects were gathered from the perusal of police

papers, from interrogation of police officers, relatives, friends & others accompanying the dead bodies. Causes of death were noted from medicolegal autopsy.

Observation & Results:

Incidence: Total numbers of unnatural deaths in newly married females during the period from February 2003 to January 2004 were 143, which constitute 4.95% of total 2889 deaths autopsied during the same period.

Most of the victims (131- 91.65%) were young adults between 18 to 26 years of age, of which 48 victims (33.57%) were between 21-22 years of age, followed by 38 (26.57%) in 18-20 years and 29 (20.28%) in 25-26 years age groups (Table 1).

Table 1. Age of the victims

Age Group	No. of Cases	Percentage (%)
18-20	38	26.57
21-22	48	33.57
23-24	16	11.19
25-26	29	20.28
27-28	7	4.89
29-30	5	3.50
Total	143	100.00

The cases were few after 26 years, probably as the age advances, the girls become mature and handle the situation in much efficient manners.

Majority of the deaths (86-60.01%) happened within 3 years of marriage. The maximum number of cases – 39 (27.27%) were found between 1–2 years of marriage, followed by 26 (18.18%) within 1 year and 21 (14.69%) between 2–3 years of marriage (table 2).

Table 2. Duration since marriage of victims

Duration (Years)	No. of Cases	Percentage (%)
< 1	26	18.18
1-2	39	27.27
2-3	21	14.69
3-4	10	6.99
4-5	18	12.59
5-6	8	5.59
6-7	21	14.69
Total	143	100.00

The number of unnatural deaths were decreased after 3 years but a slight increase was observed in 6 to 7 yrs after marriage i.e. 21 (14.69%) probably because of problems of infertility or infidelity.

Social Aspects:

Almost all the victims (135 – 94.41%) were Hindu females where dowry system is more prevalent in the society. Muslims were only 8 (5.59%) and none of them died due to dowry.

Majority of the victims were either illiterate (37 – 25.87%) or poorly educated (65 – 45.45%), only 6 (4.20%) of the victims were intermediate and 4 (2.80%) were graduate (table 3).

Table 3. Educational Status of victims

Educational Status	No. of Cases	Percentage (%)
Illiterate	37	25.87
Primary	54	37.76
Jr. High School	11	7.69
High School	31	21.68
Intermediate	6	4.20
Graduate	4	2.80
Post-Graduate	-	-
Technical / Professional	-	-
Total	143	100.00

None of them was post graduate or professionally qualified. Amongst these almost all (138 - 96.5%) the victims were nonworking (housewives) that were dependant on their husbands or in-laws. Four (2.80%) victims were laborers and one (0.70%) was a schoolteacher.

Majority (79-55.25%) belonged to lower middle (class IV), followed by 52 (36.36%) of middle (class III) socio-economic group (table 4).

Table 4. Socio-economic Status of victims

SE Class	No. of Cases	Percentage (%)
Lower (Class V)	8	5.59
Lower middle (Class IV)	79	55.25
Middle (Class III)	52	36.36
Upper Middle (Class II)	4	2.80
Upper	-	-
Total	143	100.00

Very few cases were seen from lower (class V) 8 – 5.59% or upper middle (class II) 4 – (2.80%) strata. No one was found from upper (class I) group.

The marriages were arranged in almost all (142-99.30%) the cases and three- quarters (105-73.43%) of the victims were living with their in-laws in joint families. 38 (26.57%) were living with their husbands. There was only a single case of love marriage.

About half of victims' husband were either unemployed (58- 40.60%) or sharing family business (12- 8.39%). Husbands were employed in 42 (29.37%) cases but most of them were low salaried. 19 (13.28%) of the victims' husbands had their own business (table 5).

Table 5. Occupation of the victims' husband

Occupation	No. of Cases	Percentage (%)
Unemployed	58	40.60
Service	42	29.37
Own business	19	13.28
Family business	12	8.39
Labor	06	4.20
Pheriwala	04	2.80
Others	02	1.40
Total	143	100.00

Remaining 12 (8.39%) were either laborers or doing similar job.

Family life was not happy in three quarters (107- 74.82%) of the cases. The prime cause of unhappiness was the pressure for dowry by in-laws and its inability to pay by the parents, which was ectly observed in 39 (27.27%) cases. The other causes were ill-treatment / torture by in-laws in 21(14.68%)cases rash and negligent behavior of husband in 13 (9.09%) cases & inability of victim to adjust properly in 6 (4.20%) cases (table 6).

Table 6.
Reasons behind unhappy married life of the victims

Reason of unhappy life	No. of Cases	Percentage (%)
Dowry	39	27.27
Ill-treatment by in-laws	21	14.68
Rash & negligent behavior of husband	13	9.09
Extra-marital affairs	13	9.09
Drunkenness	8	5.59

Mal-adjustment of wife	6	4.20
Poverty	4	2.80
Infertility in female	3	2.10
Total	107	74.83

The extra-marital affairs (13- 9.09%) and alcoholism in husband (8- 5.59%) were few other reasons behind marital unhappiness. The evidence of unhappy married life was not traced in 36 (25.17%) cases.

Medicolegal Aspects:

Amongst the causes of death, burning was the commonest one (63- 44.06%), followed by hanging (42- 29.37%) and poisoning (18-12.59%). As to the nature of death, about half (72- 50.35%) of unnatural deaths were suicidal. Homicidal (36-25.17%) & accidental (33-23.08%) deaths were nearly equal i.e. one fourth each of the total cases (table 7).

Table7. Cause and Manner of Death

Cause of death	Manner of death							
	Suicidal		Homicidal		Accidental		Total	
	No.	%	No.	%	No.	%	No.	%
Burning	17	11.89	13	9.09	33	23.08	63	44.06
Hanging	42	29.37	-	-	-	-	42	29.37
Poisoning	13	9.09	5	3.50	-	-	18	12.59
Strang./throttling	-	-	15	10.49	-	-	15	10.49
Drowning	-	-	1	0.70	-	-	1	0.70
Others	2	1.40	-	-	-	-	2	1.40
Total	72	50.35	36	25.17	33	23.08	143	100.00

In suicidal cases, hanging was the commonest (42- 29.37%) cause of death, followed by burning (17- 23.61%) and ill- treatment by in-laws (19- 26.39%), excessive dowry demand (18- 25.00%) and rash & negligent behavior of husband (11- 15.28%) were three important reasons behind such deaths (table 8).

Table 8. Motives behind suicidal and homicidal deaths

Motives	Suicidal deaths (72 cases)		Homicidal deaths (36 cases)	
	No.	%	No.	%
Dowry	18	25.00	21	58.33
Ill-treatment by in-laws	19	26.39	2	5.56
Rash & neg. behav. of husband	11	15.28	2	5.56
Extra-marital affairs	6	8.33	7	19.44
Drunkenness	5	6.94	3	8.33
Mal-adjustment of wife	6	8.33	-	-
Poverty	4	5.56	-	-
Infertility in female	3	4.17	-	-
Total	72	100.00	36	100.00

In homicidal cases, strangulation/ throttling was the commonest (15- 41.67 %) cause of death, followed by burning (13- 36.11 %) and failure to fulfill dowry demands (21- 58.33%) & opposing the extra-marital affairs of husband (7- 19.44%) were main reasons behind murders.

All accidental deaths were due to burning, where unprotected cooking (27- 81.81%) in loose synthetic sari (25- 75.75%) was the main factor behind the causality.

Discussion:

The high incidence of unnatural death in young Hindu females, within 3 yrs of their marriage was probably due to widely prevalent dowry system amongst Hindus of upper & middle class of Northern India, where the newly married victims were tortured for "cash/ kinds" in such a way that no option was left except to end their unhappy married life[5]. For this, they preferred hanging, burning or poisoning whatever may be easily available at the time.

For the same reason, few of them were killed by their husband or in-laws by the means of strangulation or burning. Here in some cases, bodies were also burned to tamper the evidences of murder. The authors [6] in another study of strangulation found that victims were killed & then burned to hide the crime in 38.46% cases. Thus, the perpetrators get enough opportunity to tamper with or destroy the circumstantial evidences.

Besides dowry, ill-treatment/torture by mother in-law, extra-marital affairs, rash & negligent behavior and drunkenness of husband and non-adjusting nature of wives were the other reasons behind such deaths.

Illiteracy, joint family structure, unemployment & economic dependence of husband on their parents and nearly complete dependence of women on their husband &/or in-laws were other contributory factors affecting the marital unhappiness in one or the other way [7].

This can be prevented by:

- Promoting literacy & professional courses and encouraging employment among girls to make them economically independent at the time of marriage.
- Encouraging inter-caste marriage through free choice or mutual understanding.
- Discouraging dowry demands and costly & ostentatious marriage rituals through education.
- Allowing newly wed couples to live separately from their families during first few year of their married life.

All the accidental deaths in this study were due to BURN and most of the victims caught fire while cooking on open unguarded flame such as chulha, kerosene stove, cooking gas etc. in loose, highly inflammable synthetic garments like sari. This is also because the responsibility of cooking was assigned to newly married housewife in most of the Families of Northern India [8].

Conclusion:

Deaths in newly married females due to various family problems constitute 5% of Total unnatural deaths.

- Most of the victims were young Hindu women between 18-26 years of age who died within three years of their marriage.

- Majority of the victims were poorly educated, non-working (housewives), belonging to middle or lower-middle socio-economic groups. Their marriage was arranged and they were living with their in-laws in joint family.
- Husbands were either unemployed or poor salaried and they were dependent on parents for most of the expenses.
- Family life of the victim was not happy in most of the cases. Pressure for more dowry, ill-treatment/ torture by in-laws, rash & negligent behavior or extra-marital affairs of husband were the important reasons behind family unhappiness.
- Half of the deaths were suicidal. Homicidal & accidental cases shared equally the remaining half. As a whole, burning was the most common cause of death but hanging was the commonest in suicidal, strangulation in homicidal and burning in accidental deaths.
- Ill-treatment by the in-laws, excessive pressure for dowry and negligent behavior of husband were the main reasons behind suicidal deaths. Failure to fulfill dowry demands & opposing

extra-marital affairs of husband were main reasons in homicidal deaths & wearing loose synthetic sari while cooking on unprotected flame in cases of accidental deaths.

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Dilemma for Autopsy Surgeon

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Abstract

Postmortem artifacts are commonly encountered problems in routine. They had to wrong interpretation in number of cases especially at the hands of an inexperienced autopsy surgeon and hence may mislead the course of justice. So it is suggested that all the doctors concerned with medicolegal work, especially autopsies, should be well versed with these artifacts. Then only our opinion will be conclusive and aid in the administration of justice.

KEY WORDS: - Postmortem artifacts.

Introduction:

Forensic medicine is best learned by a judicious combination of theoretical and practical knowledge. A good forensic expert is one who has not merely a vast experience in conducting autopsies, but one who has trained himself to make precise and correct interpretation of the findings. One must not allow dogmatism or inflexibility to cloud one's judgment. A self-opinionated expert is a poor expert.

There are several inherent pitfalls that must be avoided in the course of medicolegal autopsies which can lead to erroneous or fallacious conclusions. Every forensic pathologist must familiarize himself with these postmortem artefacts that are liable to misinterpretation.

Postmortem Artefacts are due to any change caused or features introduced in a body after death. The artefacts are physiologically unrelated to the natural state of the body or tissues or the disease process, to which the body was subjected to before death.

Ignorance and misinterpretation of such postmortem artefacts leads to:

- Wrong cause of death
- Wrong manner of death
- Under suspicion of criminal offence
- A halt in the investigation of criminal death
- Unnecessary spending of time and effort as a result of misleading findings or even
- Miscarriage of justice[1, 2]

Classification:

A. Artefacts of decomposition

➤ **Bloating and discoloration:**

Putrefaction of the body leads to most common artefacts. It leads to swelling of lips,

nose, eyelids, protrusion of tongue and eyes, distension of chest and abdomen and swelling of extremities.

➤ **Vesication:**

Formation of fluid filled blebs beneath the epidermis is common phenomenon of putrefaction. Differential diagnosis of such blebs from antemortem burns is important.

➤ **Purging**

In a warm atmosphere, body fluids frequently start purging out of mouth and nostrils of dead body.

➤ **Non uniform decomposition**

Putrefaction tends to be accelerated at the place where skin has been broken or blood has accumulated in the tissues.

➤ **Rupture of oesophagus or stomach**

Occasionally and for unexplained reasons agonal or postmortem digestion of the wall of the stomach or oesophagus occurs very rapidly and contents of stomach are found free in the peritoneal or pleural cavity.

➤ **Autolysis of pancreas**

Agonal or postmortem autolysis of pancreas may be well advanced.

➤ **Abnormal distensibility of rectum/ vulva/ vagina:-**

After rigor mortis has passed off, these muscular canals become readily distensible to a larger extent than that during life. There may occur inversion of uterus along with postmortem delivery. (Figure 1)



Figure No. 1
Inversion of Uterus Along With Post Mortem Delivery

➤ **Miscellaneous:**

- Due to wearing of tight garments around the neck at the time of death, it may appear as a deep groove around neck simulating ligature mark as seen in strangulation.
- Putrefactive gases within the brain may cause post mortem separation of sutures of skull of a child.
- Epidermis may easily peel off giving appearance of burn-especially in bodies exposed to sun, vital reaction is absent in such cases.
- Fissures formed in skin due to decomposition may simulate lacerated or incised wounds.
- Ethanol may be produced in putrefying bodies or during improper storage of autopsy blood, the value of which is less than 200mg%.
- Concentration of carbon monoxide after decomposition also increase up to 19%. [1]

B. Third party artefacts:-

➤ **Artifacts due to animal and insect bites**

Ants and insects mostly attack the exposed parts and moist areas of the body, such as face, arms, genitals, groins, and axilla. Rats, cats and dogs attack exposed parts and destroy soft tissues of the face, head, and hands, with little or no damage to clothed areas. Although rats attack any dead body, cats and dogs do not attack their masters unless they are starving. Marine animals mostly attack exposed areas and projecting body parts, such as lips, nose, ears, fingers and scrotum, etc. All these injuries are without a vital reaction and their edges appear nibbled. A careful look for the track of these invaders may explain peculiar lesions on body surfaces. [3] (Figure 2)

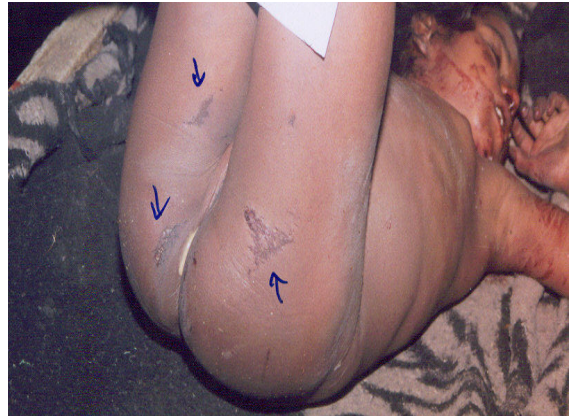


Figure No. 2
Postmortem ant Bites

➤ **Emergency medical treatment agonal and postmortem state and surgical intervention:-**

- a. External cardiac massage, defibrillator, multiple intracardiac injections.
- b. Gastric contents are aspirated in windpipe frequently. Carotid angiography may cause bruising of neck muscles giving false impression of constriction of neck.
- c. Surgeons may often take laparotomy incision through incised stab wounds.
- d. Endotracheal intubations, positive pressure artificial respiration may lead to surgical emphysema and pneumothorax. [2]

➤ ***Deliberate mutilation, dismemberment etc. by criminals:***

- a. A cadaver poses difficulty for disposal by its size and so mutilation or dismemberment may be required to remove it from the scene of crime.
- b. Sometimes criminals may inflict injuries after death to mislead investigation.
- c. Often person may be killed and thrown in water or set on fire. Careful examination for violent cause and lack of carboxy haemoglobin in blood and soot in windpipe may arouse suspicion. (Figure 3)



Figure No. 3
POSTMORTEM BURNS

- Sometimes person may be beaten to death or poisoned and then hanged. Minute examination of ligature mark and presence of associated injuries and chemicals analysis of viscera will help in correct diagnosis of cause of death.[2]
- **Embalming artifacts:**
The trocar wound may simulate a stab wound.
- **Autopsy surgeon induced artefacts:**
 - a. During opening of skull
 - b. During pulling of dura.
 - c. During forceful pulling of neck structures.
 - d. Liver, if pulled apart instead of being carefully dissected.
 - e. Cutting of bowel coils while opening abdomen.[2]
- C. Artefacts of environment:**
 - a. **Postmortem burning:**
 - b. As a result of high temperature, subcutaneous fat may become hard and ruptures which may simulate incised or lacerated wound. Heat fractures of skull may be found which may simulate injury to the skull.



Figure No. 4
HEAT SKULL FRACTURE

- c. **Postmortem Corrosion:**
- d. **Postmortem maceration;**[2,5]
- D. Other artefacts**
- **Artefacts due to rigor mortis:**
Existing rigor mortis may be broken down at least partially while removing the body from the crime scene to the mortuary, and all these may cause errors in interpretation of time since death.
- **Artefacts due to postmortem lividity:**
Isolated patches of postmortem lividity may be mistaken for bruises. Such patches on the front

and sides of the neck may be mistaken for bruising due to throttling (manual strangulation). Lividity of the internal organs may be mistaken for congestion due to disease.

- **Artefacts due to refrigeration:**
Pink hypostasis is seen in bodies kept in cold storage
- **Improper handling of the body:**
In the process of removal of the body from the crime scene to the mortuary, fresh abrasions may be produced, blood stains may form on parts of the garments originally free from them and fresh tears in clothes may result from rough handling.
- **Exhumation artefacts:**
In bodies which have been buried, fungus growth is usually seen at body orifices, eyes and at the sites of open injuries. After the removal of the fungus, the color of the underlying skin resembles bruising. Grave diggers can produce post mortem fractures, abrasions, and lacerations. Postmortem imbibition of toxicological elements in earth causes problems for toxicological analysis. [3,5]
- **Artefacts in firearm wounds:**
 - a. Drainage wounds may be mistaken for firearm wounds.
 - b. In decomposition there may be peeling of skin and loss of hair and gunpowder from the skin around an entrance wound.[4]
- **Artefacts due to delay in postmortem examination:**
Grooving of the unci, though unique feature of cerebral oedema may however be found in normal brain and tends to be prominent when there is delay in removal of brain.[2]
- **Artefacts related to petechial haemorrhages:**
Haemorrhages may occur after death in the skin of the dependent parts of the body. Like ante mortem haemorrhages, they are found in the areas where the capillaries are least supported i.e. in the eyelids and conjunctivae. Oedema of the conjunctivae which is a common finding after death from compression of the neck also may occur as a post mortem artefact if the head is maintained in a dependent position, thus adding further difficulty in diagnosis.[7]
- **Artefacts related to hair:**
The beard may appear to grow after death in some cases whereas the growth of hair stops immediately after death. The cause of this post mortem apparent growth of beard is the shrinkage of the skin, due to which greater part of the hair shaft is exposed above the epidermis.[4]

Differential Diagnosis of Artefacts:

1. **Differential diagnosis of bloating and distention of abdomen;-**
 - a. Putrefaction
 - b. Ascites
2. **Differential diagnosis of protrusion of tongue and reddish discharge from mouth;-**
 - a. Strangulation
 - b. Hanging
3. **Differential diagnosis of discolouration;-**
 - a. Traumatic asphyxia
 - b. Banskola
 - c. Burking
 - d. Opium poisoning
4. **Differential diagnosis of Vesication**
 - a. In putrefaction
 - b. Blisters in antemortem burns
 - c. Blisters in barbiturate poisoning
 - d. Poisoning by tricyclic antidepressants
 - e. Carbon monoxide poisoning
 - f. Meprobamate
 - g. Mustard gas
 - h. Lewisite
 - i. Antimony
5. **Differential diagnosis of purging**
 - a. Drowning
 - b. Opium poisoning
 - c. Barbiturate poisoning
 - d. Tik 20
 - e. Endrin
 - f. Kerosene poisoning
6. **Differential diagnosis of non uniform decomposition;-**

Because of the pressure of gases of putrefaction, postmortem stains may be displaced in any direction. If hypostasis extends to the head, it may be mistaken for violence to the neck or smothering. The skin from the hands or feet may peel off like glove or stocking in 48 – 72 hrs. This peeling off is also seen in severely burnt bodies and in drowning where the body remains in water for 2 days or more.
7. **Differential diagnosis of rupture of oesophagus and stomach;-**
 - a. Corrosive acid perforation
 - b. Ulcer perforation
8. **Differential diagnosis of autolysis of pancreas;-**
 - a. Acute haemorrhagic pancreatitis
9. **Differential diagnosis of pendulous female genitals appear and discharge from genitalia;-**
 - a. Sexual assault

- b. Postmortem delivery in case of pregnant woman
- c. Criminal abortion

Conclusion:

Medicolegal Autopsy or Forensic Autopsy is learnt only through extensive practical experience and the doctor conducting the autopsy carries great responsibility over his shoulders. It is obvious that if he is unable to extract proper interpretation of the findings, the pangs of justice will be disturbed and therefore, it is imperative that all unusual findings must be meticulously examined and photographed and if need be, some experienced, better qualified colleague may be approached there and then. The doctor should learn to draw conclusions logically and rationally, instead of forming hasty judgment.

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Doctor and Law

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Abstract

After the Consumer Protection Act, 1986, came into effect, a number of patients have filed cases against doctors. This article presents a summary of legal decisions related to medial negligence: what constitutes negligence in civil and criminal law, and what is required prove it.

Public awareness of medical negligence in India is growing. Hospital managements are increasingly facing complaints regarding the facilities, standards of professional competence, and the appropriateness of their therapeutic and diagnostic methods. After the Consumer Protection Act, 1986, has come into force some patients have filed legal cases against doctors, have established that the doctors were negligent in their medical service, and have claimed and received compensation. As a result, a number of legal decisions have been made on what constitutes negligence and what is required to prove it.

Civil law and negligence:

Negligence is the breach of a legal duty to care. It means carelessness in a matter in which the law mandates carefulness. A breach of this duty gives a patient the right to initiate action against negligence. Persons who offer medical advice and treatment implicitly state that they have the skill and knowledge to do so, that they have the skill to decide whether to take a case, to decide the treatment, and to administer that treatment. This is known as an "implied undertaking" on the part of a medical professional. In the case of the State of Haryana Vs Smt. Santra, the Supreme Court held that every doctor "has a duty to act with a reasonable degree of care and skill" (1).

Doctors in India may be held liable for their services individually or vicariously unless they come within the exceptions specified in the case of Indian Medical Association Vs V P Santha (2). Doctors are not liable for their services individually or vicariously if they do not charge fees. Thus free treatment at a non-government hospital, government hospital, health center, dispensary or nursing home would not be considered a "service" as defined in Section 2 (1) (0) of the Consumer Protection Act, 1986.

However, no human being is perfect and even the most renowned specialist could make a mistake in detecting or diagnosing the true nature of a disease. A doctor can be held liable for negligence only if one can prove that she/he is guilty of a failure that no doctor with ordinary skills would be quality of if acting with reasonable care (3). An error of judgement constitutes negligence only if a reasonably competent professional with the standard skills that the defendant professes to have,

and acting with ordinary care, would not have made the same error (4).

In a key decision on this matter in the case of Dr. Laxman Balkrishna Joshi Vs Dr. Trimbak Bapu Godbole, the Supreme Court held that if a doctor has adopted a practice that is considered "proper" by a reasonable body of medical professionals who are skilled in that particular field, he or she will not be held negligent only because something went wrong.

Doctors must exercise an ordinary degree of skill (5). However, they cannot give a warranty of the perfection of their skill or a guarantee of cure. If the doctor has adopted the right course of treatment, if she/he is skilled and has worked with a method and manner best suited to the patient, she/he cannot be blamed for negligence if the patient is not totally cured (6).

Certain conditions must be satisfied before liability can be considered. The person who is accused must have committed an act of omission or commission, that act must have been in breach of the person's duty; and this must have caused harm to the injured person. The complainant must prove the allegation against the doctor by citing the best evidence available in medical science and by presenting expert opinion (7).

In some situations the complainant can invoke the principle of *res ipsa loquitur* or "the thing speaks for itself". In certain circumstances no proof of negligence is required beyond the accident itself. The National Consumer Disputes Redressal Commission applied this principle in Dr. Janak Kantimathi Nathan Vs Murlidhar Eknath Masane (8). The principle of *res ipsa loquitur* comes into operation only when there is proof that the occurrence was unexpected, that the accident could

not have happened without negligence and lapses on the part of the doctor, and that the circumstances conclusively show that the doctor and not any other person was negligent.

Criminal negligence:

Section 304A of the Indian Penal Code of 1860 states that whoever causes the death of person by a rash or negligent act not amounting to culpable homicide shall be punished with imprisonment for a term of two years, or with a fine, or with both.

In the Santra Case, the Supreme Court has pointed out that liability in civil law is based upon the amount of damages incurred; in criminal law, the amount and degree of negligence is a factor in determining liability. However, certain elements must be established to determine criminal liability in any particular case, the motive offence, the magnitude of the offence, and the character of the offender.

In Poonam Verma Vs Ashwin Patel the Supreme Court distinguished between negligence, rashness, and recklessness (9). A negligent person is one who inadvertently commits an act of omission and violates a positive duty. A person who is rash knows the consequences but foolishly thinks that they will not occur a result of her/his act. A reckless person knows the consequences but does not care whether or not they result from her/his act. Any conduct falling short of recklessness and deliberate wrongdoing should not be the subject of criminal liability.

Thus a doctor cannot be held criminally responsible for a patient's death unless it is shown that she/he was negligent or incompetent, with such disregard for the life and safety of his patient that it amounted to a crime against the State (10).

Section 80 and 88 of the Indian Penal Code contain defences for doctors accused of criminal liability. Under Section 80 (accident in doing a lawful act) nothing is an offence that is done by accident or misfortune and without any criminal intention or knowledge in the doing of a lawful act in a lawful manner by lawful means and with proper care and caution. According to Section 88, a person cannot be accused of an offence if she/he performs an act in good faith for the other's benefit, does not intend to cause harm even if there is a risk, and the patient has explicitly or implicitly given consent.

Burden of proof and chances of error:

The burden of proof of negligence, carelessness, or insufficiency generally lies with the complainant. The law requires a higher standard of evidence than otherwise, to support an allegation of negligence against doctor. In cases of medical negligence the patient must establish her/his claim against the doctor.

In Calcutta Medical Research Institute Vs Mimallesh Chatterjee it was held that the onus of proving negligence and the resultant deficiency in service was clearly on the complainant (11). In Kanhaiya Kumar Singh Vs Park Medicare & Research Centre, it was held that negligence has to be established and cannot be presumed (12).

Even after adopting all medical procedures as prescribed, a qualified doctor may commit an error. The National Consumer Disputes Redressal Commission and the Supreme Court have held, in several decisions, that a doctor is not liable for negligence or medical deficiency if some wrong is caused in her/his treatment or in her/his diagnosis if she / he has acted in accordance with the practice accepted as proper by a reasonable body of medical professional skilled in that particular art, though the result may be wrong. In various kinds of medical and surgical treatment, the likelihood of an accident leading to death cannot be ruled out. It is implied that a patient willingly takes such a risk as part of the doctor-patient relationship and the attendant mutual trust.

Recent Supreme Court rulings:

Before the case of Jacob Mathaw Vs State of Punjab, the Supreme Court of India delivered two different opinions on doctor's liability. In Mohanan Vs Prabha G Nair and another (13), it ruled that a doctor's negligence could be ascertained only by scanning the material and expert evidence that might be presented during a trial. In Suresh Gupta's case in August 2004 the standard of negligence that had to be proved to fix a doctor's or surgeons criminal liability was set at "gross negligence" or "recklessness".

In Suresh Gupta's case the Supreme Court distinguished between an error or judgement and culpable negligence. It held that criminal prosecution of doctors without adequate medical opinion pointing to their guilt would do great disservice to the community. A doctor cannot be tried for culpable or criminal negligence in all cases of medical mishaps or misfortunes.

A doctor may be liable in a civil case for negligence but mere carelessness or want of due attention and skill cannot be described as so reckless or grossly negligent as to make her/him criminally liable. The courts held that this distinction was necessary so that the hazards of medical professionals being exposed to civil liability may not unreasonably extend to criminal liability and expose them to the risk of imprisonment for alleged criminal negligence. Hence the complaint against the doctor must show negligence or rashness of such a degree as to indicate a mental state that can be described as

totally apathetic towards the patient. Such gross negligence alone is punishable.

On September 9, 2004, Justices Arijit Pasayat and CK Thakker referred the question of medical negligence to a large Bench of the Supreme Court. They observed that words such as “gross,” “reckless,” “Competence”, and “indifference” did not occur anywhere in the definition of “negligence” under Section 304A of the Indian Penal Code and hence they could not agree with the judgment delivered in the case of Dr. Suresh Gupta.

The issue was decided in the Supreme Court in the case of Jacob Mathew Vs State of Punjab (14). The court directed the central government to frame guidelines to save doctors from unnecessary harassment and undue pressure in performing their duties. It ruled that until the government framed such guidelines, the following guidelines would prevail:

A private complaint of rashness or negligence against a doctor may not be entertained without prima facie evidence in the form of a credible

opinion of another competent doctor supporting the charge. In addition, the investigation officer should give an independent opinion, preferably of a government doctor. Finally, a doctor may be arrested only if the investigating officer believes that she/he would not be available for prosecution unless arrested.

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The Fire is Both “A Blessing & Scourge to the Mankind”

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Abstract

Man has always needed fire either to prepare his food to satisfy his hunger or to induce warmth during winters. Simultaneously he is constantly exposed to the hazards of burns, which begins right from the day one of his life, when the maternity nurse gives him the first hot water bath. That is why it is said, “The fire has been both a blessing and scourge to the mankind”. The present study was conducted in department of forensic medicine PDU Medical College, Rajkot during the period from Nov.2004 to Oct.2005 with a view to study the profile of burn cases brought for the post mortem examination. All the data related to age, sex, marital status, type and manner of burns with area involved, and survival time were recorded with detailed autopsy examination and subsequently analyzed statistically. We reached at a conclusion that majority of the victims were married females of younger age group between 20-40 years, with an extensive accidental flame burns.

Key words: - Burn, Dowry deaths and Unnatural deaths in women.

Introduction:

Burning has always been a dreaded threat to the sensitive human body. With advent of gasoline, automobiles and aeroplanes in the civil life and of bombing in wartime, the threat has increased. Now we have entered the era of atomic bomb and the threat has expanded like the “Arabian Genie”, emerging from the bottle. Hiroshima & Nagasaki bomb blast incidence bears the testimony where more than 80% of casualties took place only because of burns.

Dowry deaths in India have become a problem of great concern. Almost every day we get to see in the electronic media and so to read in the newspapers, case of young women either being burnt or provoked to commit suicides by the husband and in-laws, just for the dowry. At the same time accidental burns in women also occur commonly, to which they are more vulnerable as most of the women (housewives) spend their time in the household especially in the kitchen.

Thus the higher incidences of burns in the Saurashtra region and high mortality rates in these cases even with advanced medical facilities, has prompted us to undertake this study, hence this study was undertaken to know epidemiological aspects, pattern and other significant features of death due to burns, and to compare with the

observations of various authors by scientific discussion.

Material and Method:

Total 1694 autopsies were conducted in the mortuary of PDU Medical College, Rajkot from Nov.2004 to Oct.2005. During that period, out of 1694 cases, 300 cases of burns were selected for this study. Related general information like the age, gender, marital status, hospital stay and the history about scene of crime, etc. of the cases was collected from relatives, eyewitnesses, concerned investigating police officer and police panchanama. At the time of post mortem, the gross features of burns during external and internal examination were noted with an attention to examination of clothes. Every attempt was made to find out the source causing the casualty, types of burn with their duration, and manner of burns, area involved and finally the cause of death in all cases. All findings were compiled in a specially designed Performa for study and the data were reduced to tables, graphs and subsequently subjected to computer added statistical analysis and conclusions were drawn after comparing and discussing with similar type of the work carried out by foreign and Indian authors.

Observations:

Out of total 300 cases males were 81 (27.0%) and female were 219 (73.0%) in number, making a M: F ratio of 1:2.7. While the age wise distribution of cases shows that 60% of all victims were of younger age group between 21-40 years while on extremes of age the incidences are less (Table-1).

Table-1**Distribution of burn cases according to Age and Sex**

Age group (in years)	Male	Female	Total cases
1-10	07 (2.33%)	09 (3.0%)	16 (5.33%)
11-20	05 (1.67%)	37 (12.33%)	42 (14.0%)
21-30	33 (11.0%)	87 (29.0%)	120 (40.0%)
31-40	17 (5.67%)	43 (14.33%)	60 (20.0%)
41-50	07 (2.33%)	13 (4.33%)	20 (6.67%)
51-60	03 (1.0%)	19 (6.33%)	22 (6.0%)
Above 60	09 (3.0%)	11 (3.67%)	20 (6.67%)
Total cases	81 (27.0%)	219 (73.0%)	300 (100%)

Distribution of burn cases according to marital status show that the incidences are higher in

married people 232 cases (78%) as compared to unmarried people 68 cases (22%). Out of married couples 76.29% victims were female while the rest 23.71% were male (Table-2).

Table-2**Distribution of burn cases according to marital status**

Marital Status	Male	Female	Total cases
Married	55 (18.33%)	177 (59.0%)	232 (78.0%)
Unmarried	26 (8.67%)	42 (14.0%)	68 (22.0%)
Total cases	81 (27.0%)	219 (73.0%)	300 (100%)

In our study most of the burn cases were of flame burns 279 (93%) followed by cases of scalds 12 (4%) and lastly 9 (3%) cases of electric burns. Among 279 flame burns, 215 (77.06%) victims were females and 64 (22.93%) were males. Most of the female victims of flame burns were in the younger age group of 21-40 years while in scalds and electric burns males were commonly involved in 83.33% and 77.77% correspondingly (Table-3).

Table-3**Distribution of burn cases according to types of burn**

Type of burn	Sex	Age group (in years)						Total
		0-10	11-20	21-30	31-40	41-50	> 51	
Flame Burn	Male	05	00	28	17	04	10	64
	Female	09	35	86	43	12	30	215
Subtotal		14	35	114	60	16	40	279 (93%)
Scald Burn	Male	02	03	02	00	02	01	10
	Female	00	01	01	00	00	00	02
Subtotal		02	04	03	00	02	01	12 (04%)
Electric Burn	Male	00	02	03	00	01	01	07
	Female	00	01	00	00	01	00	02
Subtotal		00	03	03	00	02	01	09 (03%)
Grand total		16	42	120	60	20	42	300

As per history, circumstantial evidences and post-mortem findings it was noticed that in most of the burn victims the manner of death was accidental in 183 cases (61%) followed by suicidal in 105 cases (35%) and homicidal in only 12 (4%) cases (Table-4).

Table-4**Distribution of burn cases according to manner of death**

Manner of Death	Number of cases
Accidental	183 (61 %)
Suicidal	105 (35 %)
Homicidal	12 (04 %)
Total cases	300 (100 %)

Distribution of burns cases according to involvement of body surface area shows that in 232 cases (77.33 %) more than 50 % of body surface area was involved while in 48 cases (16 %) 40-50 % body surface area was burnt and in only 20 cases (6.67

%) the involved body surface area was less than 40 % (Table-5).

Table-5**Distribution of burn cases according to involvement of body surface area**

Body surface area involved	Male	Female	Total cases
< 40 %	4 (1.33 %)	16 (5.33 %)	20 (6.67 %)
40-50 %	16 (5.33 %)	32 (1.67 %)	48 (16.0 %)
50-60 %	46 (15.33 %)	89 (39.67 %)	135 (45.0 %)
60-70 %	11 (3.67 %)	72 (24.0 %)	83 (27.67 %)
> 70 %	4 (1.33 %)	10 (3.33 %)	14 (4.67 %)

Maximum percentage of victims 166 (55.33 %) died within in first 24 hours due to hypovolumic shock (burns- shock). Only 16 victims (5.33 %) were found dead on spot due to neurogenic shock, while 19

victims (6.33%) died with in a duration of 24-36 hours, followed by 46 victims (15.33%) in 36-72 hours, 31 (10.33%) in 3-7 days and only 22 victims (7.33%) could survive more than a week. In all cases that died after 36 hours the cause of death was septicemia (Table-6).

Table-6

Distribution of burn cases according to duration of survival & cause of death

Duration of Survival	Number of cases	Cause of Death
Spot death	16 (5.33%)	Neurogenic Shock
1-6 hours	33 (11.0%)	Hypovolumic Shock
6-12 hours	64 (21.33%)	Hypovolumic Shock
12-24 hours	69 (23.0%)	Hypovolumic Shock
24-36 hours	19 (6.33%)	Hypovolumic Shock
36-72 hours	46 (15.33%)	Septicemia
3-7 days	31 (10.33%)	Septicemia
> 7 days	22 (7.33%)	Septicemia

Discussion:

The incidences of female burns in India are reportedly the maximum and the major share comes from dowry deaths. Dowry death is a consequence of well planned deed to get rid of the female by the husband or in-laws. Most of the victims die on the spot, and those who survive, hesitate to give the right statement in front of law enforcing agencies and hence further encourage such culprits and their disgusting activities.

The incidence of burn deaths in present study was 17.71%, which was higher in third decade of life in married females as similar to most of the other studies by various authors [1, 2, 3, 8, 9, 11] and [13]. This might be due to their involvement with domestic cooking work and dowry deaths. The higher incidence was also observed in younger males, which may be due to modern life style, stress, tension, family and social problems. In the present study majority of the burn deaths were due to flame burns followed by scalds and electric burns, similar to other studies [3, 5,] and [10] except Tempest NM¹² who took study sample from cases of domestic burns and scalds from a different region. Most of the studies [3, 4, 6] including this study show that majority of the cases were accidental deaths followed by suicidal deaths. This inference of manner of death is based on history given either by police or and relatives, circumstantial evidences and post-mortem findings. The higher number of accidental and suicidal deaths especially in females may be due to their involvement in domestic cooking work responsible for accidental cases and marital mal-adjustment resulting in suicidal or bride burning cases.

In majority of the victims more than 50 % of the body surface area was burnt, due to which most of the victims (60.67 %) died within very first day of the incidence, as also reported by the other authors [11, 12]. Most of the burn victims died either on the spot due to neurogenic-shock or with in first 36 hours due to hypovolumic-shock. After that the cause of death in all cases was septicemia and complications arising from it.

Conclusion:

Distribution and causes of burns in present study are more or less similar to the pattern found in most of the other Indian studies. This similarity is there in almost all parameters used in this study. Most of the burn victims were married females of younger age group, who died due to hypovolemia with in very first day of incidence either due to accidental or suicidal burns involving more than 50% body surface area.

The observations also indicate that patients with lesser percent burns or with lesser risk of death are not able to survive even at the tertiary level of our health care system. It can be a result of either poor approach or negligence or improper upgradation of the so-called ICU's and burn-units with today's techniques and advanced mode of facilities.

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Sexual Harassment of Women Current Scenario of Indian Hospitals

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Abstract

Sexual Harassment of women at work place is prevalent throughout the globe. India is no exception to this evil based on gender discrimination especially in health care set ups, is a grave form of human rights violation of a almost half of the human folk. Although the Hon'ble Apex Court of India has ruled in 1997 regarding the implementation of guidelines to prevent sexual harassment of women at work place, but without effective implementation, results in violation of human rights of working women as well as service consumers in Indian hospitals. The Bill on this issue is also pending in the Parliament for its nod since 2005.

This paper deals with current scenario of Sexual Harassment of Women in Indian Hospitals, the Supreme Court of India's views, Brief dissuasion of New Bill on the issue, so that persons involved in this noble profession can be made aware of their duties and rights to prevent human rights violations involved with this issue.

Key Words: Sexual Harassment, Women, Hospital, Supreme Court.

Introduction:

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. Others worried about loss of reputation after complaining, less job security, etc. The study [1, 2] revealed victims were sexually harassed by not only their co-workers but also by patients and their relatives.

Doctors and nurses in the UK will be banned from having sexual relationships with former patients, it has emerged. Health professionals will only be allowed to date those they have previously treated when the clinical contact they had with each other was 'minimal'. New guidelines will formally set out the sexual boundaries between doctors, nurses and patients for the first time: following a string of sex abuse scandals.

Scenario in UK:

Doctors and nurses in the UK will be banned from having sexual relationships with former patients, it has emerged. Health professionals will only be allowed to date those they have previously treated when the

clinical contact they had with each other was 'minimal'. New guidelines will formally set out the sexual boundaries between doctors, nurses and patients for the first time: following a string of sex abuse scandals.

What was instrumental for formulating 'guidelines' in UK?

There have been a number of disturbing cases in recent years including Folkestone GP Clifford Ayling who was able to continue working despite complaints spanning 30 years. He was jailed for four years in December 2003 on 13 counts of indecent assault between 1991 and 1998. Ayling repeatedly convinced women they needed intimate examinations, and then sexually abused them. Many of Ayling's patients complained that he was 'overtly sexual' in his behaviour, and colleagues were aware of the concerns. But a report into the case said there was little guidance as to how the NHS (National Health Services) should deal with such concerns.

Similarly, an inquiry showed a 30-year history of abuse of women psychiatric patients by Dr. William Kerr and Dr. Michael Haslam at Clifton Psychiatric Hospital, York.

As a result the Department of Health commissioned Council for Healthcare Regulatory Excellence (CHRE) to bring in clear guidance for health professionals on acceptable behaviour. The draft guidance was drawn up by a project team run by the CHRE, which included

clinicians, victims of abuse, royal colleges and representatives from healthcare regulatory bodies.

Draft proposals say:

- Doctors and nurses attracted to patients should seek advice from a colleague and may have to handover treatment.
- Relationships with ex-patients are 'generally not acceptable' unless clinical contact was minor or temporary, for example, a short consultation in Accident & Emergency.
- Cases will be judged individually where possible striking off offences has occurred.
- But the guidance stresses that relationships are unprofessional if the patient is exploited, vulnerable or the clinical contact was broken off in order to start a sexual relationship.
- Even when a patient's consent is given, this alone will not be enough to justify a sexual relationship being pursued by a doctor or nurse.

UK Health Ministers are expected to approve the guidance from the CHRE in June-2007. [3]

Indian Scenario:

Sexual Harassment as Professional Misconduct:

Abuse of professional position by committing adultery or improper conduct **with a patient** or by maintaining an **improper association with a patient** will render a physician liable for disciplinary action as provided under the Indian Medical Council Act (IMC Act) 1956 or the concerned State Medical Council Act (SMC Act). [4]

From professional misconduct point of view term 'adultery' involves doctors (both male and female), patient (both male and female) and their attendants, etc. Again consent of any of the party is no defense to escape the liability for punishment. Degree of association is not defined it may vary from consensual sexual intercourse to any unwanted degree of physical relationship.

What is sexual harassment at workplace?

Sexual harassment is unlawful discrimination against a person with respect to that person's compensation, terms of employment, conditions of employment, or privileges of employment, because of or on account of the person's gender. (Source: www.legal-Term.Com)

Supreme Court Defines Sexual Harassment at Work Place:

The Hon'ble SC judgment has defined sexual harassment as "unwelcome sexually determined behaviours" 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. [6]

What constitute 'Hostile Work Environment'?

2(u) "Hostile Work Environment" is said to be created when any act of Sexual Harassment has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile or offensive working environment. [9]

The SC of India exercising its extraordinary powers under Articles 32 and 141 of the Indian Constitution for enforcement of 'Fundamental Rights' prohibited Sexual Harassment of Women (SHW) at work places laying down guidelines to fill the vacuum in existing legislation. Until suitable legislation will not be enacted in this area, these **directions** which would be binding, and enforceable in law. [6]

The judgment by a three judge's bench headed by **CJI, J.S. Verma, J., Sujata V. Manohar, and J., B.N. Kirpal**, came on a petition brought as a class action by social activists and **NGOs** for the enforcement of 'Fundamental Rights' of working women. [6]

It also stated that when a woman has reasonable grounds to believe that her objection would "disadvantage" her in connection with her employment it would be considered as "discriminatory". [6]

In a study "Sexual Harassment at Work Place: Experiences of Women in the Health Sector", 135 women interviewed over a period of 11 months and found that "Sexual harassment in hospitals, of women doctors and nurses, seems to have become a common practice in India. In a shocking study carried out by **International NGO, Population Council**, 77 of the 135 women doctors and nurses, working in four **hospitals in Kolkata**, admitted sexual harassment. However, over 50 of them did not complain".

As many as 45: reported psychological harassment, 41: verbal harassment, 21: unwanted touch and 16: sexual gestures and exhibitionism. The study also revealed that just 20 of the 135 women interviewed were aware of the Supreme Court's Guidelines on sexual harassment.

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 Committees effectiveness. The study [3, 4] revealed victims were sexually harassed by not only their co-workers but also by patients and their relatives.

Doctors and nurses alike agree that sexual harassment is an occupational hazard for working women. A 30 years-old government doctor said, "We have accepted this and this is how things will continue". A 35 years-old nurse added, "Saying bad things when they see a woman is natural. It doesn't matter if the man is a doctor or non-medical staffers".

The study also found that in a large number of cases the victims were reluctant to go public on this issue. Of the 135 women interviewed, 45 were doctors. Of the 50 nurses, 31 were victims of sexual harassment.

Less Job Security:

The study further revealed that “By and large, doctors and nurses in **Government Hospitals** are **permanent** employment or on contracts that they will lose their job if they go public”. [1, 2]

Shockingly, the biggest perpetrators of abuse were **patients and their family** followed by **doctors** and **non-medical staff**. Nurses are the only group harassed by everyone: doctors, non-medical staff, patients and their relatives and outsiders. [1, 2]

Without a precise definition of what constitutes a woman's ‘modesty’, for over a century, courts tried thousands of the offences of “**outraging the modesty**” of a woman. And now, the SC has finally defined ‘modesty’. Its definition: “The essence of a woman's modesty is her sex”. [5]

The result of the labour of the Bench comprising Judges: **Arijit Pasayat** and **S.H. Kapadia** will help a glaring void in **the Indian Penal Code, 1860**, but the scope of the definition of ‘modesty’ as mentioned in **Section 354 IPC** appears to go far beyond what framers of the code possibly had in mind. [5]

“The act of pulling a woman, removing her saree, coupled with a request for sexual intercourse... would be an outrage to the modesty of a woman; and knowledge, that modesty is likely to be outraged, is sufficient to constitute the offence”, the Bench said in a judgment that has drawn from several verdicts by different courts. [5]

In other words, outraging a woman's modesty as mentioned in Section 354 IPC will apply to crimes against women that stop short of penetration, in which event it becomes rape. In the same judgment, the Court ruled that penetration alone was sufficient to qualify as rape whether there has been ejaculation or not. [5]

The Court's definition shows growing sensitivity to a changing society in which relatively subtle acts of harassment of women have come to be viewed as crime. The Court also clarified that claim of lack of protest can't be an alibi. The bench said: “The culpable intention of the accused is the crux of the matter. The reaction of the woman is very relevant, but its absence is not always decisive”. [5]

Gravity of offence:

Sexual harassment is a serious criminal offence, which can destroy human dignity and freedom. In an effort to promote the well being of all women employees at the work place the following code of conduct has been prescribed as Misconduct:

- Eve Teasing

employees and those in **Private Hospitals** tend to work as consultants. Healthcare attendants are employed by patients on a temporary basis and have the **least job security** than those in government hospitals. Reluctance to discuss sexual harassment stems from the fear of those on daily wage

- Unsavoury remarks
- Jokes causing or likely to cause awkwardness or embarrassment.
- Innuendos and taunts
- Gender based insults or sexist remarks.
- Unwelcome sexual tone in any manner such as over telephone (obnoxious telephone calls) and the likes.
- Touching or brushing against any part of the body and the like.
- Displaying pornographic or other offensive or derogatory pictures, cartoons, pamphlets or sayings.
- Forcible physical touch or molestation.

Broader meanings:

- Gender Discrimination.
 - Physical confinement against one's will,
- Any other act likely to affect one's privacy and includes:

Any act or conduct by a person in authority and belonging to one sex which:

- denies or would deny equal opportunity in pursuit of career development, or
- other wise making the environment at the workplace hostile or intimidating to a person belonging to the other sex, only on the ground of sex.

Disciplinary Actions for ‘Sexual harassment’:

Employees: can be

- Suspended,
- Demoted,
- Dismissed,
- Deprived of increments, or
- Promotion.

Students: can be

- Suspended,
- Expelled,
- Result withheld, or
- Be debarred from examinations.

Harassed? Just log on:

- www.nationalcommissionforwomen.org
- www.empowering-women.com

Websites should include:

- Complaints and counseling units.
- Workplace code of conduct.
- Laws, new bills, laws proposed.

- Landmark judgments.
- Where to go and whom to contact?
- Expert committees; where to access them.
- View's on women's issues.
- Online complaint mechanism.
- Important help lines / Contact addresses, etc.

Reasons for Harassment: (Source NCW)

- Pornographic material others (1.24%).
- Others (24.46%).

Types of Harassments:

- Physical harassment (25.17%).
- Gender discrimination (68.26%).
- Mental harassment (32.62%).
- Others (24.45%).

Whose duty is to prevent SHW?

It shall be 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 and to provide the procedures for the resolution, settlement or prosecution of acts of sexual harassment by taking all steps required.

Where any of these acts is committed in circumstances, that the victim of such conduct has a reasonable apprehension that in relation to the victim's employment or work whether she is drawing salary, or honorarium or voluntary, whether in government, public or private enterprise, such conduct can be humiliating and may constitute a health and safety problem.

It is discriminatory for instance when the woman has reasonable grounds to believe that her objection would disadvantage her in connection with her employment or work including recruiting or promotion or when it creates a hostile work environment. Adverse consequences might be visited if the victim does not consent to the conduct in question or raises any objection thereto.

Preventive Steps:

All employers or persons in charge of work place whether in the public or private sector should take appropriate steps to prevent sexual harassment. Without prejudice to the generality of this obligation they should take the following steps:

- (a). Express prohibition of sexual harassment as defined above at the work place should be notified, published and circulated in appropriate ways.
- (b). The Rules/Regulations of Government and Public Sector bodies relating to conduct and discipline should include rules/regulations prohibiting sexual- harassment and provide for appropriate penalties in such rules against the offender.
- (c). 'As regards private employers steps should be taken to include the aforesaid prohibitions in the

- Ego problems (39.89%).
- Sexual perversions (12.05%).
- Sexual obsession (3.72%).
- Widowhood (1.06%).
- Separation from spouse (1.77%).

- Media influence (6.38%).

Standing Orders under the Industrial Employment (Standing Orders) Act, 1946.

(d). Appropriate work conditions should be provided in respect of work, leisure, health and hygiene to further ensure that there is no hostile environment towards women at work places and no employee woman should have reasonable grounds to believe that she is disadvantaged in connection with her employment.

Criminal Proceedings:

Where such conduct amounts to a specific offence under the Indian Penal Code or under any other law, the employer shall initiate appropriate action in accordance with law by making a complaint with the appropriate authority.

In particular, it should ensure that victims or witnesses are not victimized or discriminated against while dealing with complaints of sexual harassment. The victims of sexual harassment should have the option to seek transfer of the perpetrator or their own transfer.

Disciplinary Action:

Where such conduct amounts to misconduct in employment as defined by the relevant service rules, appropriate disciplinary action should be initiated by the employer in accordance with those rules.

Complaint Mechanism:

Whether or not such conduct constitutes an offence under law or a breach of the service rules, an appropriate complaint mechanism should be created in the employer's organization for redress of the complaint made by the victim. Such complaint mechanism should ensure time bound treatment of complaints.

Complaints Committee:

The complaint mechanism should be adequate to provide, where necessary, a Complaints Committee, a special counselor or other support service, including the maintenance of confidentiality.

The Complaints Committee should be headed by a woman and not less than half of its members should be women. Further, to prevent the possibility of any undue pressure or influence from senior levels, such Complaints Committee should involve a third party, either **NGO** or **other body** who is familiar with the issue of sexual harassment.

The Complaints Committee must make an annual report to the Government department concerned of

the complaints and action taken by them.

The employers and person in charge will also report on the compliance with the aforesaid guidelines including on the reports of the Complaints Committee to the Government department.

Workers' initiative:

Employees should be allowed to raise issues of sexual harassment at workers' meeting and in other

Third Party Harassment:

Where sexual harassment occurs as a result of an act or omission by any third party or outsider, the employer and person in charge will take all steps necessary and reasonable to assist the affected person in terms of support and preventive action.

Role of Governments:

The Central / State Governments are requested to consider adopting suitable measures including legislation to ensure that the guidelines laid down by this order are also observed by the employers in Private Sector. [6]

Summary and Conclusions:

If any employer or administrator of a Hospital **ever** allow or encourage harassment by remaining silent, there can be serious consequences. Part of their job is to promote and protect the welfare of employees. There can be at least two serious consequences:

- **Firstly**, the situation can get out of hand quickly and become much worse and
- **Secondly**, administrator may be the one accused of harassment because he let it happen.

Both of these consequences can have serious repercussions on administrators and Institution. In fact, there are at least **three ways** in which administrators may be alerted to a harassment situation in the workplace:

- An employee of organization might complain about another employee;
- Administrator may witness or over hear certain behaviours that might be considered harassments; and
- Administrator may even see or hear about behaviour that certain constitute harassment.

If an employee complains about the behaviour of another employee, the first thing administrator must do is to listen carefully. Do not offer an opinion and do not display emotions. Do not react rashly; at this point all administrator have is the word of someone who has a vested interest in the charge. Instead approach the situation by gathering data. Ask specific questions to the person complaining and then ask specific questions to the person against whom the complaint is made. This is not the time for evaluating the answers but for collecting the information. Inform seniors / supervisor of the situa-

appropriate forum and it should be affirmatively discussed in Employer Employee Meetings.

Awareness:

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, tion and then conduct subsequent investigations. [8]

If administrator observes what may be harassment ask the employees who were the target of the potential harasser, if the behaviour was indeed offensive to them. If the answer is yes, explain that such behaviour need not be tolerated. Ask questions and conduct an 'investigation to determine additional facts. If administrator thinks that the behaviour of a person is offensive, inform the employees of all possible risks associated with the observed behaviour. Do this in a friendly manner, and not one that would seem to be corrective and accusatory, because the offending employee might not have been aware of the potential reaction to the behaviour. An appropriate comment from administrator at this point could prevent an unpleasant situation in the future.

When an administrator sees or hears behaviours that certain is harassment, it's his responsibility to stop it right away. Administrator's acknowledgment of the situation and confrontation of the offender may be enough to end the behaviour, 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 the encounter to your seniors / supervisor. [7, 8]

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Fracture of the Temporal Bone: A Tomographic V/S Autopsy Study

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Abstract

The present study was conducted in the Dep't. of Forensic Medicine & Toxicology, SMS Medical College Jaipur (Raj), in the period from 15 Dec. 2001 to 4 April 2002. With the aim to find out the correlation of X-ray (Skull), CT scan (Head), Surgical intervention findings with the autopsy findings in the cases of acute Head trauma. Total of 140 cases of acute head trauma were selected irrespective of age, sex, religion caste etc. who had been admitted in Neurosurgery dep't. And X-ray, CT scan head and /or surgical intervention had been done, subsequently died & autopsy was performed. X- ray skull gave batter information on fracture of skull than CT Scan, particularly when the fracture is located on the vault or base of skull and is of linear variety [1]. 27 cases of fracture of the temporal bone were specially studied, out of these 140 cases. All these cases had the features of triad, indicating of fracture of petrous part of temporal bone i.e. CSF Otorrhoea 14(51.1%), 7th nerve palsy 9(33.3%), serve middle ear bleeding 18(66.6%) & conducting hearing loss 5(85%). The plain X-ray demonstrated the fracture of temporal bone in 21 cases (79%) and the CT Scan demonstrated their in 24 cases (88%) Longitudinal fractures are common in 18 cases (66%) and procedure of choice for their demonstration is lateral tomography, Transverse fracture alone was uncommon (2cases) and can only be demonstrated in anterior posterior tomographic projections and is usually associated with occipital fractures.

CT Scan Examination give better information in detection of fracture of temporal bone as well as the type of fracture [2] which is essential for planning the surgical intervention or treating the patient conservatively in order to avoid the complications like, persistent CSF otorrhoea, posterior meningitis or even death.

Key Words: RTA (Road Traffic Accident), CT Scan (head) Temporal bone fracture, Head trauma, Autopsy Head.

Introduction & Clinical Material:

The CT scanning is said to reveal promptly, accurately and non invasively the intra cranial and parenchymal abnormalities in acute cranio-cerebral trauma that were previously recognized only at autopsy therefore the CT scan (head) is indispensable in the diagnosis of the various traumatic lesion and their management I, it also carries prognostic value. Fracture of petrous and tympanic part of temporal bone is not uncommon. Fracture of petrous and tympanic part of temporal bone was identified with the aid of CT Scan and the finding was confirmed and correlated with autopsy findings [3, 4, 5]. The present study was conducted on 140 cases of Acute Head Trauma admitted in the Neurosurgery Department of the S.M.S. Hospital, Jaipur (Rajasthan) who died there and subsequently postmortem examination was performed, during period Dec-2001 to Apr-2002 [6].

TABLE-1
Age & Gender Wise Distribution of Cases

Age in Years	Male		Female		Total	
	Number	%	Number	%	Number	%
> 10	21	17.2	9	50	30	21.4
11-20	12	9.8	-		12	8.5

21-30	27	22.1	1	5.5	28	20
31-40	26	21.3	2	11.1	28	20
41-50	19	15.5	1	5.5	20	14.2
51-60	10	8.2	3	16.6	13	9.2
61-70	6	4.9	1	5.5	7	5
70 <	1	0.8	1	5.5	2	14
Total	122		18		140	100

TABLE-2
Manner of Injury in Acute Head Trauma

Manner of Injury	Number of Cases	%	Male		Female	
			Number	%	Number	%
Traffic Accident	87	62.1	81	93.1	6	6.8
Fall	43	30.7	32	74.4	11	25.8
Assault	7	5	6	85.7	1	14.2
Unknown	2	1.4	2	100	-	-
Miscellaneous	1	0.7	1	100	-	-
Total	140	100	122	89.1	18	12.8

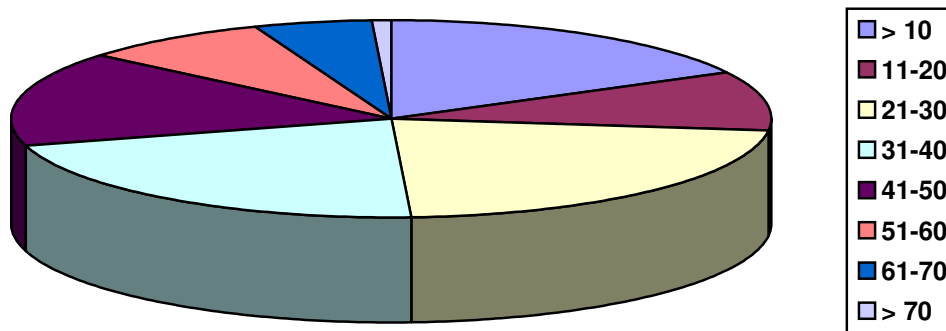
BAR DIAGRAM – 1

DISTRIBUTION OF CASES ACCORDING TO MANNER OF TRAUMA VIS-À-VIS AGE & GENDER



PIE DIAGRAM –2

DISTRIBUTION OF CASES ACCORDING TO AGE



PIE DIAGRAM – 3

DISTRIBUTION OF CASES ACCORDING TO GENDER

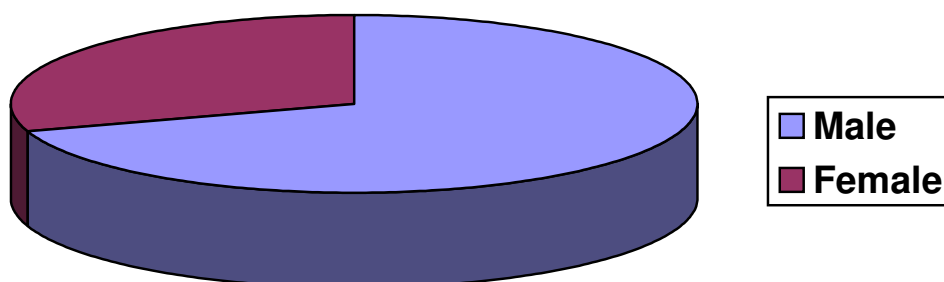


TABLE-3
MANNER OF ACUTE HEAD TRAUMA VIS-À-VIS AGE

Age Group	Traffic Accidents	%	Fall	%	Assault	%	Unknown	%	Miscellaneous	%
> 10	5	3.5	25	17.8	-	-	-	-	-	-
11-20	8	5.7	4	2.8	-	-	-	-	-	-
21-30	26	18.5	1	0.7	-	-	1	0.7	-	-
31-40	20	14.2	6	4.2	1	0.7	-	-	1	0.7
41-50	11	7.8	4	2.8	4	2.8	1	0.7	-	-
51-60	12	8.57	1	0.7	-	-	-	-	-	-
61-70	4	2.8	2	1.4	1	0.7	-	-	-	-
70 <	1	0.7	-	-	1	0.7	-	-	-	-
Total	87		43		7		2		1	

The cases of Head injury were suspected of temporal bone fracture with presence of one or more signs of the triad of: Cerebrospinal fluid otorrhoea, Facial nerve Palsy & severe bleeding from ear along with additionally conducting hearing loss.

The fracture of pterous part of temporal bone was demonstrated in 27 (19.2%) cases out of 140 cases of acute head trauma. All the 27 cases were presented with feature of triad, indicative of fracture pterous part of temporal bone. CSF Otorrhea-14(51.1%), 7th Nerve Palsy-9(33.3%), Severe middle ear bleeding-18 (66.6%), Conductive hearing loss-5 (18.5%).

TABLE NO 4
CLINICAL MENIFESTATION SUGGESTIVE OF TEMPORAL BONE FRACTURE

PRESENTING FEATURE	NUMBER OF CASES
Otorrhea	14
7 th Nerve Palsy	9
Severe middle ear bleeding	18
Conductive Hearing Loss	5

The over all incidence of Roentogenographic demonstration of fracture of the petrous bone 79% i.e. in 21 cases out of 27 cases on Plain X-ray. And in CT Scan 88% in 24 cases out of 27 cases.

TABLE – 5
LOCATION OF FRACTURES OF SKULL ON X-RAY FILM

Location of #	Fracture Side			Linear #	Depressed #	Comminuted # Left
	Left	Right	B/L			
Frontal	16	9	3	24	4	-
Parietal	18	16	5	29	10	-
Temporal	10	13	2	25	-	-
Occipital	3	3	-	6	-	-
Anterior Fossa	-	-	-	-	-	-
Middle Fossa	-	-	-	-	-	-
Posterior Fossa	-	-	-	-	-	-
Total (88 cases)	47	41	10	84	14	-

TABLE – 6
LOCATION OF FRACTURES OF SKULL ON CT SCAN

Location of #	Fracture Side			Linear #	Depressed #	Comminuted #
	Left	Right	B/L			
Frontal	16	9	1	19	7	-
Parietal	20	15	-	26	9	-
Temporal	10	14	-	20	3	1
Occipital	-	-	-	-	-	-
Anterior Fossa	-	-	-	-	-	-
Middle Fossa	-	-	-	-	-	-
Posterior Fossa	-	-	-	-	-	-
Total (85 cases)	46	38	1	65	19	1

TABLE – 7
LOCATION OF FRACTURES OF SKULL DETECTED AT AUTOPSY

Location of #	Fracture Side			Linear #	Depressed #	Comminuted #
	Left	Right	B/L			
Frontal	12+4+2	6+2+1	1	18	6	3
Parietal	20+3+0	16+2+1	-	36	5	1
Temporal	13+0+1	10+3+0	2	23	3	1
Occipital	6+1+0	3+1+1	2	9	2	1
Anterior Fossa	21	4	2		-	-
Middle Fossa	26	16	6		-	-
Posterior Fossa	7	3	2		-	-
Total (118 case)	116	69	15	86	16	6

Table – 7 depicts the anatomical location of the fractures of the skull as well as their types i.e. linear, depressed and comminuted. There were linear fractures in 86 cases, depressed in 16 cases and comminuted in 6 cases. The side of the fracture (right, left or bilateral) has also been depicted in this table and the type of the fracture is depicted with (+) signs to describe the linear/ depressed/ comminuted type of the fracture.

Because at autopsy the fractures of the skull were seen and demonstrated therefore the percentage of fracture detection was considered cent percent (100%) and as per the aims and objectives of the present study, taking this fact into consideration the findings of the x-ray skull (Table - 5) and CT scan (head) (Table - 6) are compared. Accurate demonstration of pattern of the fracture of petrous bone is important in those cases having persistent CSF otorrhoea / facial nerve palsy / middle ear bleeding, if surgical intervention is contemplated. The localisation of the entrance of fracture into one or other intra cranial fossa will determine the operative approach [7]. Demonstration of the site of involvement of facial canal will aid to the surgeon for the decompression of facial nerve.

Anatomically the tympanic bone forms the anterior wall floor and part of posterior wall of external auditory canal and is attached to the rest of the temporal bone at the tympano-mastoid fissure and the petro-tympanic fissure. [8].

Fracture of the petrous bone was demonstrated by tomography in 24 boys and girls between the age of 13 months and 14 years [9]. All had a history of head injury one or more of CSF otorrhoea, 7th nerve palsy, and severe middle ear bleeding or conductive hearing loss. (Table - 4) Severe middle ear bleeding was judged to be severe only if it was marked and persistent [10]. Fracture of petrous part of temporal bone was demonstrated by CT Scanning in 24 cases out of 27 cases no fracture of petrous bone was demonstrated in 3 cases and in plain x-ray, in 21 cases fracture was demonstrated out of 27 cases. 2 Children with CSF Otorrhoea and 3 children with 7th

nerve palsy had the presenting symptom and these signs got resolved spontaneously but child had died due to some other cause. The history or clinical evidence of trauma to jaw was specifically excluded in all cases in this study.

Technique and Results:

Computerized Tomography at interval of 1 mm was performed in every cases, Lateral tomography was performed on all cases, antero-posterior tomography in 23 cases and basal tomography in 20 cases. The entire petrous bone from external auditory meatus to the foramen lacerum area was visualized in all cases. B Conventional roentgenogram demonstrated associated fracture of the vault in 25 out of the 27 cases. Associated tympanic fracture was demonstrated in 23 cases, in 21 cases fracture passed into the middle cranial fossa of the skull and in 3 cases it extended into the posterior cranial fossa, in 2 cases both the middle and posterior cranial fossa were fractured. Precise pattern of fracture of petrous bone has been studied at operation /postmortem, and they were labeled as longitudinal /transverse and combined fracture.

Longitudinal fractures are most common 66% i.e. 18 out of 27 cases and the procedure of choice for their demonstration is lateral tomography (16) cases. They are not visible in anterior-posterior projection, and they passed from temporal squama or from the posterior parietal bone into the petrous bone along its longitudinal axis.

The posterior longitudinal fracture involved both the posterior superior portion of petrous bone and the sinus plate inferiorly and posteriorly in 8 cases out of 18 cases of longitudinal fracture of petrous bone.

Transverse fracture alone was uncommon and was found in 2 cases and involved either the roof or floor of middle ear cavity. This fracture could be demonstrated in the antero-posterior but not in the lateral projection. Transverse fracture was typically associated with occipital fracture.

Combined fracture i.e. the longitudinal and transverse fracture leading to fragmentation of petrous bone associated posterior parietal fractures were found in 3 cases.

Discussion:

In this study the Tomographic characteristic of petrous bone fracture in injured are similar to those found at operation and in the cadaver skull. The fractures are longitudinal, transverse or a combination of both. The autopsy feature revealed that the longitudinal fracture involved either the anterior or posterior portion of the roof of petrous bone [11]. These fracture commonly extended to one or another neighboring foramina e.g. jugular, internal auditory meatus, foramen lacerum or roof of Eustachian tube with associated and adjacent fracture of parietal or occipital bone .Pure longitudinal fracture was not found.

Combination fracture are common due to road traffic accident and that such fractures having large fragment of bone lying free of the posterior –superior and posterior-inferior portion of bone .They certainly produce persistent CSF otorrhea and are usually fatal. Fractures involving the cochlea were difficult to detect by tomography and even at routine post-mortem examination. The high incidence of CSF Otorrhea, persistent middle ear bleeding, 7th nerve palsy are the alarming sign which should prompted CT Scan investigations.

Therefore the CT Scan examination gives better information in detection of fracture of temporal bone as well as the type of fracture which is essential for planning the surgical intervention or treating the patient conservatively in order to avoid the complication like Severe conductive deafness, persistent CSF Otorrhea, posterior meningitis or even death.

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Evolution of Forensic Medicine in India

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Abstract

Development of the mankind took millions and millions of years and along with it, medicine also developed to leap and bounds. With development of medicine, legal aspects of it also came into picture, which lead to the development of the subject Forensic Medicine or Medical Jurisprudence. Our religious and mythological literature contains the detailed description of issues related to law and medicine and there solutions.

Key Words: - History of Forensic Medicine.

Introduction:

Medical Jurisprudence, or, as it is sometimes called, Forensic, Legal, or State Medicine may be defined to be that science which teaches the application of every branch of medical knowledge to the purpose of the law; hence its limits are, on the one hand, the requirements of the law, and on the other, the whole range of medicine. Anatomy, Physiology, Medicine, Surgery, Chemistry, Physics and Botany lend their aid as necessity arises; and in some cases all these branches of science are required to enable a Court of Law to arrive at a proper conclusion on a contested question affecting life or property. The word 'Forensic' is derived from the Latin word forensis, meaning 'of the forum'. It denote the branch of medicine which deals with the application of the principles and knowledge of medicine for the purpose of law, both civil and criminal.[1]

Many a genius from the pages of Ancient Indian history had ever influenced the Rule of Law. Their word remained an integral part of the Government's functioning, leave alone. The oldest known, Law Code that of Hammurabi, king of Babylon, dating from 2900 BC includes provisions regarding rights and duties of medical practitioner and laid down punishment for physician's negligent fracture [2]. One such personage happens to be Kautilya, also called as Chanakya and Vishnugupta, who wrote the **Arthashastra**, which is the most comprehensive treatise of statecraft of classical times. The book covered numerous topics viz., the king, code of law, foreign policy, secret and occult practices and so on. Even after a gigantic lapse of time – more than 2000 years – the master strategist widely known as India's Machiavelli continues to rake up the minds of the country's modern – day spiritual gurus.[3]

Kautilya's Arthashastra states that death can be caused by four ways of stopping the breathing (strangling, hanging, asphyxiation or drowning); two ways of physical injury (by beating or by throwing

from a height); or poisoning (by poisons, snake or insect bite or narcotic drugs).

If death is suspected to be due to poisoning, the undigested parts of the meal were tested by feeding it to birds. Cases of suicide by hanging were investigated to rule out the presence of ante-mortem injuries. Similarly, on finding the murdered body of a stranger, his personal belongings such as cloths, dress and ornaments were examined. Kautilya's Arthashastra describes the necessity of autopsy in establishing the cause of death after smearing the body with oil to bring out bruises, swellings and other injuries.[1]

Veda is abundant source of knowledge. It is considered as the basic scripture of Hinduism. The word Veda is derived from the Sanskrit root 'vid', which means 'to know' it is said that God created the knowledge in a unique form called '**Veda**'. As it was not created by any purusha or man, it is called **APAURUSHEYA**. Later the great sage Vyaasa, who compiled eighteen puraanaas and wrote Mahabharata, classified Veda as Rig Veda, Sama Veda and Adharva(na) Veda.[4,5]

However, the great sage could foresee this and classified Veda into four in order to make it is for the coming generations to understand and follow them. In the ancient tradition of Gurukul, gurus taught Vedas to their disciples by means of chanting and disciples learnt them by listening. That is why the Vedas were called as '**SHRUTHIS**'. [6]

The **Atharva Veda** gives details about remedies for various conditions in the form of charms. There were charms to cure wounds, burns, poisoning, snake bite, and insanity. Dissections of dead animals were done during this period for the sake of knowledge.[1]

Charaka Samhita is considered to be the most ancient and authoritative writing on Ayurveda available today. It also explains the logic and philosophy on which this system of medicine is based [7]. Supposed to have been composed in

based.[7] Supposed to have been composed in about the seventh century BC. The Charaka Samhita lays down an elaborate code regarding the training, duties, privilege and social status of physicians. It can be considered as the origin of medical ethics. Students were selected for training on fixed criteria, and instructions were given free. The 'Charaka Samhita' gives a detailed description of various poisons, symptoms, signs and treatments of poisoning.

Susruta wrote his Samhita, the most authentic text on the practice of Ayurvedic surgery around the sixth century BC. Susruta is, also, renowned as the father of plastic surgery.[7] In Samhita chapters pertaining to forensic medicine were so carefully written that they are in no way inferior to modern knowledge on the subject. It also contains a separate chapter on toxicology. The poisons were classified into:

- (1) Plant products
- (2) Animal products, and
- (3) Artificial.

Not only were the symptoms signs and treatment of poisoning described in detail, but also modes of administration of poisons, character of the poisoner and examination of suspected poisonous materials. A poisoner could be known from his behaviour and movements – he will not answer to questions, will keep silent, talk irrelevantly and so on. Poisons were administered through food and drinks; tooth stick; oils and materials for massage; medicaments; water for bathing; articles of clothing; snuffs; smokes and surmas. Emetics and their use are mentioned. The duty of the physician was to save the king from any poisoning or Visha – Kanya- the poisonous damsel. Qualities, responsibilities and duties of physicians were defined. Shusruta is unique on chapters on injuries, pregnancy and delivery. Types of weapons and foreign bodies, the signs and symptoms they manifest in the body has also been described. Wounds and fracture of bones have been classified. Principles of cohabitation, signs in a woman fit for conception after periods; signs immediately after impregnation and signs of pregnancy have been mentioned. Among these are darkening of areola and nipple, dropping of eyelids, vomiting without any cause, salivation, and tiredness over the body. Delivery, abortions and foetal development at various months of pregnancy has been very accurately described.[1]

In Muslim period in India the criminal laws were well developed and became a landmark. At that period 'Quasi-I-Mumalik' was in charge of civil and criminal litigations. His function was to find out facts and apply the law. There were so many defects in the Muslim criminal law which were detected by

Britishers and were even abolished.[8,9] The first recorded medico-legal autopsy was performed in India by Dr Edward Bulkley on the afternoon of 28 August 1693. When Mr Wheeler, member of council, Sea Customer and Chief Justice of Choultry in Chennai, died on 28 August 1693.

In 1822, the first medical school was established in Kolkata and converted into a Medical College in 1835. In the same year, Madras Medical College was also established in Chennai. The first chair of professor of medical jurisprudence was established at Madras Medical College in 1857.

The most outstanding contribution of India to legal medicine during British period is modern dactylography. It was Sir William Herschel of the Indian Civil Services, who first used this method of identification in 1858. Based on Herschel's theory. Sir Francis Galton of England devised the systemic study and methods of using fingerprints for personal identification in 1892.[1]

The British government altered this law from time to time till 1862 when the Indian Penal Code came into existence. Infact the foundation of our criminal laws is still Mohammedan law but it is so altered and added to by our regulations that it ceases its originality.[9]

Four law Commissioners of whom Lord Macaulay was the chief, prepared the draft Penal Code and submitted to the Governor-General in Council on 14th October 1837. On 26th April 1845, it was sent to a Commission of two gentlemen to be revised in the light of English Law, which was then intended to modify and for which a similar Commission had been then sitting in England. This Commission submitted two reports, dated 5th Nov 1846 and 24th Jun 1847. The Bill as revised was pigeon hole for twelve or more years and was passed into law only on 6th Oct 1860. The code as enacted was different from the Bill prepared by the law Commissioner who had recommended only 488 while the code as enacted contained 511 sections.[9,10]

The Indian Medical Council was established in 1933. The police system of crime investigation was introduced in India in 1861 and the coroners systems in 1871 in the presidency towns of Bombay and Calcutta.[1]

Recently the teaching of forensic medicine has improved with the establishment and expansion of the academic departments of forensic medicine and toxicology: in most of the medical colleges. Postgraduate courses in forensic medicine are available in several universities.

It is hoped that trained medico-legists will be available in India in sufficient large numbers in the districts, around the turn of the century.

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X- Ray examination – A good tool for identification in decomposed body: A case report

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Abstract

The X-ray examination of corpse is most useful in medico-legal autopsies, in various ways, especially related to establishment of identity. The identification of decomposed body poses difficulty as compared to fresh body as ordinary means of identification like fingerprints & photographs have little value in such cases. Old healed fractures, bony deformities, metallic implants and foreign bodies in bones are extremely helpful for identification of a body where previous history is available. In the present case, a metallic rod in right femur visible on X-ray examination led to positive identification in decomposed body.

Key words: Identification decomposed metallic implants.

Introduction:

Medical science has advanced significantly in recent past due to development of newer techniques. Among the newer techniques, forensic radiology is widening its horizon in medico-legal autopsies. The role of radiology is well established in identification of corpse. Though it is relatively easy to establish identity in fresh bodies, it becomes very difficult task in case of decomposed body. In such cases, use of x-ray examination is helpful where ante mortem radiograph or data is available for comparison.

Case History:

An unknown male, about 40 years of age, was found in a well on 12th Sep. 2004. The body was in decomposed state. The body was brought to Government Medical College, Nanded for medico-legal postmortem examination.

Autopsy Findings:

On examination of deceased, mud stained gray coloured full pant & dirty white coloured banian were found. Other articles like black coloured thread in neck, thread in right wrist, and red coloured waist thread and jute rope around waist were noted.

Signs of decomposition in body included bloating and distortion of features with loss of soft tissue at places, falling of hairs, peeling of skin & plenty of maggots seen crawling over body making the feature unrecognizable.

Some persons residing in nearby locality where body was found came to mortuary as one of their relative was missing since four days. On viewing the body, clothes & other articles recovered at the time of postmortem examination and considering the approximate age of the deceased, they suspected it to be their missing relative but couldn't identify conclusively as the body was decomposed. One of them fortunately could recall that missing relative had a road traffic accident fifteen years ago and was implanted a metallic rod in thigh as a treatment for fracture femur.

After getting this clue, the body was sent for x-ray examination. X-ray examination of both thighs was carried out which showed a metallic rod in right femur, which corroborate with the available history.

Every sincere effort was made to trace the ante mortem radiograph of the deceased for comparative radiographic study to co-relate as per available history, which went in vain.

However on the basis of clothes & other articles recovered from the body, approximate age of the deceased and a metallic rod in right femur visible on x-ray examination, identity of the deceased was established conclusively.

Discussion:

Establishment of identity is one of the objectives of medico-legal autopsy.[1, 2, 3] Relatives and friends of deceased person usually establish identity in recently dead person. But in India, considering the climatic condition, the decomposition progresses rapidly, which hampers the establishment of identity. As the interval between death and examination of body progresses, efficacy of establishment of identity by ordinary scientific means such as photographs and fingerprints decreases. Establishment of identity is difficult not only in highly decomposed bodies but also in charred bodies, mutilated bodies and fragmentary remains. In such cases the help of other means such as x-ray examination of body is sought to establish identity.[1, 2, 3] Jablonski NG et al.[4] in his study reported two cases in which positive identification of unknown human remains were achieved by comparison of radiographs. Lichtenstein JE et al. [5] discussed role of radiology in identification of casualty victims by comparison with ante mortem films and records. Fitzpatrick JJ [6] carried out a study of 100 identifications with the help of radiographs. Brogdon BG [7] discussed scope of forensic radiology including determination of identity. Schmidt G et al.[8] studied use of radiographs in forensic autopsy and reviewed various modes of their application including identification of corpse

from bone. Bratzke H et al [9] studied 427 radiographic examinations during the course of medico-legal autopsies & discussed various uses of radiology including identification of person.

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Post Mortem radiograph of right thigh of the deceased showing metallic rod in femur

Age Determination from Sternal ends of the Ribs- an Autopsy Study

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Abstract

A random study of 500 cases for age determination from sternal ends of the ribs was carried out in the Department of Forensic Medicine and Toxicology, Govt. Medical College, Amritsar with joint supervision of Department of Anatomy. The aim of the study was to determine the age after death with minimal error. Currently there are different parameters available to determine the age of a person like study of teeth, ossification of bones and other ancillary data, but the accurate reliability of these measures is only limited to a particular age group i.e. 25 ± 5 years. For the age beyond this, many workers in different parts of the world have done their studies to accurately determine the age of a person from the skeleton. Study by Iscan et al (1984) has emphasized fair amount of accurate assessment of age from the sternal end of the ribs. The present study was a similar attempt to analyze the reliability and accuracy of Iscan et al's (1984) work in this part of the world.

Key Words: Identity, Age, Ribs, Pit.

Introduction:

Identity means the determination of the individuality or recognition of a person of dead body. The identification of a dead body is required in cases of sudden and unexpected deaths in unclaimed bodies, fires, explosions, railways or aircraft accidents, mutilated or decomposed bodies; often need great medicolegal acumen. In Corpus Delicti, doctors have to establish two facts: Identity as well as Cause of death. Identity of a person is done by using various parameters in which Age is also one of the most important parameter [1]. Methods to estimate age at death are important for the study of skeletal remains, whether the context is biarchaeological, paleontological or forensic in nature [2].

To establish identity Department of Forensic Medicine and Toxicology, Govt. Medical College, Amritsar used the sternal end of 4th rib of both sides to assess the age of the victim. In this regard, sternal end of the rib was chosen because it has been established to be a perfect bone to show the advancement of age. Also, it appeared to fit **Howell's** criterion of showing advancements of age rather than the effects of "function and stress" [3]

Material and Methods:

The study was based on a collection of ribs of both

sexes from 500 postmortem cases brought to the Mortuary complex of Govt. Medical College, Amritsar. Detailed data regarding age, sex and race were derived from birth record, relatives and police papers. The sternal extremity of 4th rib of both sides was chosen because it fairly represents true rib and can be easily extracted during a postmortem examination. The samples consisted of individuals above 17 years of age, as morphological matamorphosis at the sternal end of the rib is not observed until this age[4]. Each rib was examined in reference to feature like pit depth (component I), pit shape (component II) and rim and wall configurations (component III). Pit depth is one of the most obvious age related changes observed in sternal end of the rib. The maximum depth of this pit was measured with a depth caliper calibrated to 0.1 mm by keeping the caliper perpendicular to base of the pit. Component II deals with changes in the shape of the pit. Initially the put showed only a slight, amorphous indentation; with in about one year from its first appearance, it developed into a V shaped structure. Over the next few years, the base of V widened to become U-shaped. As age increased the walls of the pit grew thinner forming a progressively wider U. Component III analyzes changes in the configuration of the rim and walls of the pit. The rim started as a smooth, regular border

around the pit that rapidly assumed a scalloped but still fairly regular shape. Eventually, with advancing age the rim and walls became increasingly irregular, thin and sharp [5, 6]

The different data noted were recorded in the Performa framed for the purpose. Following the individuals analysis of each component they were summed to obtain a total score per rib. From the total score, mean bone age was calculated as per Iscan's method. To test the significance of mean bone age as a factor in explaining and forecasting the observed age of a subject the simple regression analysis technique had been used.

Observations:

The present study was conducted on 500 dead bodies but the dissected out rib for the study purpose was obtained in good shape only in 395 cases. In rest of the cases, the end of the ribs were broken/distorted due to injuries/fractures. The study was conducted on the basis of method used by Iscan et al [6,7] In the current study, the known age of the corpses was recorded to compare with estimated age/test age.

Out of the total 395 cases, in 309 cases the known age (Actual age) of the deceased was available as per Performa from police papers/birth record/relatives and in 86 cases, no record related to the actual age was furnished by the police or was available from any other source, as the identity of these corpses was not known at the time of autopsy to the investigating officer. Distribution of cases with known/unknown age is shown in Table I.

Known age wise distribution of 309 cases is shown in Table II. Maximum cases were reported in the age group 21-30 years (112) and minimum were reported in the age group of >60 years (14). Sexwise distribution of 309 cases is shown in Table III. Out of 309 cases, 244 cases were males and 65 cases were females. Area wise distribution of 309 cases is shown in Table IV. 143 cases belonged to urban area and 166 cases belonged to rural area. All 309 cases were studied and scoring was done. Mean bone age was calculated from these scores as per Iscan's method. To test, the significance of mean bone age as a factor in explaining and presenting the known/actual age of a subject from sternal end of 4th ribs of both sides, the Simple Regression Analysis method had been used. In the current study all the cases had been further categorized into 3 groups as follows (depending upon their age).

1st group - 17-30 years

2nd group - 31-44 years

3rd group - 45 years and above

These groups were made to make sure that whether the mean bone age and the known/actual age of the subjects varied in the 3 age groups.

Groupwise values of mean actual age (\bar{Y}), calculated, calculated mean bone age (\bar{X}), Standard deviation ($\pm S.D$) and 95% Confidence interval of 309 cases was calculated as shown in Table V.

Results & Discussion:

In the present study, no significant changes were observed in the metamorphic developments at the sternal end of the 4th rib of the two sides as concluded by Yoder et al (2001)[8] as well.

In the present study, statistical analysis showed (as shown in Table V) that in the first age group (17-30 years) for right sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=7.92+0.646 X$ with the standard error of regression coefficient 0.0031. This gave highly significant value of $t=208.38$. Moreover coefficient of determination $r^2=49\%$, indicated that 49% of known/actual age is explained by the single factor of mean bone age which was again found to be highly significant (computed t of $r^2=11.62$). In the same age group for the left sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=6.76\pm 0.692 X$ with the standard error of regression coefficient 0.0031. This gave highly significant value of $t=223.22$. Moreover coefficient of determination $r^2=52\%$ indicated that 52% of known/actual age is explained by the single factor of mean bone age which was again found to be highly significant (computed t of $r^2=12.21$).

In the age group of 31-44 years for right sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=28.48\pm 0.204 X$ with the standard error of regression coefficient 0.0020. This gave highly significant value of $t=102$. Moreover coefficient of determination $r^2=21\%$ indicated that 21% of known/actual age is explained by the single factor of mean bone age which was again found to be highly significant (computed t or $r^2=4.54$). In the same group, for the left sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=29.9\pm 0.167 X$ with the standard error of regression coefficient 0.0024. This gave highly significant value of $t=69.58$. Moreover, coefficient of determination $r^2=23\%$ indicated that 23% of known/actual age is explained by the single factor of

mean bone age which was again found to be highly significant (computed t of $r^2=4.82$).

In the age group of 45 years and above for the right sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=0.543\pm 1.085 X$ with the standard error of regression coefficient 0.0221. This gave highly significant value of $t=49.09$. Moreover coefficient of determination $r^2=36\%$ indicated that 36% of known/actual age explained by the single factor of mean bone age which was again found to be highly significant (computed t of $r^2=7.29$). In the same age group for the left sided 4th rib, the estimated regression line of known/actual age (Y) on the calculated mean bone age (X) was computed to be $Y=-9.27+1.29 X$ with the standard error of regression coefficient 0.027. This gave highly significant value of $t=47.77$. Moreover, coefficient of determination $r^2=40\%$ indicated that 40 percent of known/actual age was explained by the single factor of mean bone age which was again found to be highly significant (computed t of $r^2=7.87$).

Results of the present study showed that the age of a subject can be estimated from metamorphic changes in the costochondral junction of 4th ribs of both sided in all the age groups, as the t -values computed in all the cases were found to be highly significant (i.e. >3).

Iscan et al (1984-85)[6,7] concluded that age at death can be estimated from a rib within about 2 years in 2nd decade to about 7 years in the 5th and 6th decades of life and **Singh et al (1999)**[9] revealed that age can be estimated from sternal end of 4th rib with an accuracy ranging between ± 2 years upto 3rd decade and about ± 8 years in the older age which is slightly invariance with our study. However, from the present study, we could analyze that in the age group of 17-30 years, calculated standard deviation for the right 4th ribs came out to be 4.00 and for left 4th rib was 3.98 with 95% confidence interval of 17.49-33.17 and 17.50-33.14 respectively which is quite accurate. But, in the second age group, the reliability falls as the calculated standard deviation of this group for right sided 4th rib was 7.89 and for left sided 4th rib were 7.70 with 95% confidence interval of 24.45-55.38 and 25.23-55.43 respectively. In the third age group (45 years and above), the standard deviation again came out to be more reliable i.e. 4.72 for the right sided 4th rib and 4.12 for the left sided 4th rib with 95% confidence interval of 38.95-57.45 and 40.07-56.22 respectively. Hence, it is concluded that in the first age group, age can be estimated from sternal end of 4th rib with an accuracy ranging between ± 8 years, in the second

age group ± 15 years and in the third age group again ± 8 years.

So still in the field of Forensic Medicine, we remain handicapped to exactly pinpoint the accurate age from one single factor, as metamorphic changes in the sternal end of the 4th rib alone are not sufficient to assess the accurate age of a subject. On analysis of the study of **(Baccino et al (1999))** [10], we are also of the opinion that unifactorial parameter to assess the age from the sternal end of the ribs for practical purposes is not 100% fool proof. So multifactorial parameteric/ comprehensive approach should be the hallmark for arriving to conclusion as regard to the age of the subject.

Conclusions:

Even if the study gave us rough estimation of age by using the method of Iscan et al, on sternal end of ribs, but the multifactorial parametric approach to assess the age will be far more better than a single parameter i.e. assessment of age from sternal end of the 4th rib.

Table I
Distribution of Samples As Per Known/Unknown Age

Known/Unknown age	Number	Percentage
With known age	309	78.22
Without known age	86	21.78
Total	395	100.0

Table II
Age wise Distribution of Samples

Age group (in years)	Number	Percentage
17-20	27	8.73
21-30	112	36.24
31-40	69	22.33
41-50	64	20.71
51-60	23	7.44
>60	14	4.53
Total	309	100.0

Table III
Sex wise Distribution of Samples

Sex	Number	Percentage
Male	244	78.96
Female	65	21.04
Total	309	100.00

Table IV

Group	Mean actual age (Y)	Calculated mean bone age (X)	S.D.	95% confidence interval
For Right Side Ribs				
1 st Group (17-30 Years)	24.29	25.33	4.00	17.49-33.17
2 nd Group (31-44 Years)	36.64	39.92	7.89	24.45-55.38
3 rd Group (45 Years And Above)	52.84	48.20	4.72	38.95-57.45
For Left Side Ribs				
1 st Group (17-30 Years)	24.29	25.32	3.99	17.50-33.14
2 nd Group (31-44 Years)	36.64	40.33	7.70	25.23-55.43
3 rd Group (45 Years And Above)	52.84	48.15	4.12	40.07-56.22

Table V

Area Wise Distribution of Samples

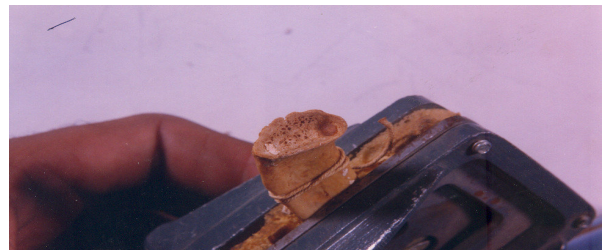
Area	Number	Percentage
Urban	143	46.28
Rural	166	53.72
Total	309	100.0

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Photograph 1
Showing Minimal Pit Depth with 'V' Shaped Pit Having Thick Walls



Photograph 2
Showing Increasing Pit Depth with Wide 'U' Shaped Pit Having Brittle and Porous Texture



Photograph 3
Showing Still Increasing Pit Depth with Irregular Sharp Rib Having Bony Projections With Incomplete Walls

Battered Child? – A Case Report

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Abstract

A four year old Muslim female child came with alleged h/o fall in school with bluish discoloration around the left eye, neck, back and limbs. The paediatrician suspected this to be a case of bleeding disorder because of family history as her elder sister was suffering from platelet disorder. Finally it turned out to be a physical assault case with no any ill or evil intention.

Key words: Battered child, Contusion, Bleeding disorder.

Introduction:

A battered child is one who has received injuries as a result of non-accidental violence, produced by a parent or a guardian. In addition to physical injury, there may be non-accidental deprivation of nutrition, care and affection[1].

In the Eastern Culture, babies are considered as gifts from God and cases of battered baby syndrome are rare. However, instances of ill treatment of young children who work as domestic servants are on record where employers have beaten such children with sticks or branded with a pair of hot tongs. The crime comes to light only when such children complain to someone who knows their mother tongue[2]. However, the awareness in these aspects has recently caused concern among professionals and enlightened citizens, specially in the advanced countries where the problem has been reported to have increased to ten fold in the last decade[3]. In the third world countries with poorer societies, continuous socioeconomic stress induces the parents to abuse their children[4].

In India, references to child labour in earlier times and well regulated tolerance of child abuse by parents have been documented as an integral part of the cultural ethos of family units.

In USA, specially, "Ohio Revised Code" indicates that endangering a child includes violating duties of care, support or protection. Physical abuse in Indian situation includes torture, cruel abuse, excessive punishment and restraint that creates substantial risk of physical harm to the child. [5,

6] Most researchers and authorities agree on the basic issue of child abuse resulting from parental misuse or exploitation of the rights of parents or of other guardians to control and discipline children under their care, which is detrimental to the child's health and well being [7,8].

Case Report:

A four year old Muslim female child was brought to KLES Hospital with alleged h/o fall in school. Prior to fall the patient was alright. After that there was bluish discoloration (contusion) of skin around the left eye which alarmingly increased in size, panicking the parents and rushing the patient to hospital. Similar bluish discolorations (contusions) were present over neck, back and limbs. There were no bleeding manifestations in the past. Family history revealed that the eldest sister aged nine years suffered from bleeding disorder (Idiopathic Thrombocytopenic Purpura). There was no family h/o bleeding disorder in neither the father's nor the mother's family. The patient weighed 10 kgs. She was moderately built and nourished. On examination, all the vital parameters were within normal limits. The mother had normal delivery in the hospital. All the developmental milestones were normal. Possibility of bleeding diathesis was strongly suspected and the relevant investigations done by the paediatrician were within normal limits. Ophthalmic examination revealed the left black eye with subconjunctival haemorrhage. On fundoscopic examination there was no retinal detachment.

Psychiatric examination revealed that the mother was no more. The elder sister in the family aged nine years took care of all the day to day needs of the younger sister who was four years. Beating and pinching were the most common punishments given by the elder sister for all the mischievous done by the younger sister and for not studying. These incidents were frequent in nature but this time the intensity of beating was relatively severe resulting in contusions.

Thorough examination of the elder sister revealed no psychiatric illness but it was only her concern towards the welfare of the younger sister. She was a mother-like sister and may be when she failed to make her younger sister listen to her she might have got frustrated and angry, this might have resulted in beating her up severely unknowingly about what could happen.

Conclusion:

This case was initially misdiagnosed as Battered Baby Syndrome. Further probing and consultation with Forensic Experts revealed that this was purely an accident case and this was not done with any ill intention of harming the younger child. This case was concluded as an accident which happened unintentionally by an elder sister who took her mother's place in showing concern for her younger sister. She herself was a young child who needed concern and care from some caring guardian.

A recent WHO estimate shows that 40 million children in the world, aged 0 – 14 years are abused and neglected. These children require both health care and social care [9].

Recent times has witnessed cruelty on children at an alarming rate in India too. Very little is reported about this in our Indian literature. Latest Indian studies on physical abuse of children reveal that the problem of child abuse is more prevalent in metropolitan cities and urban sectors than in rural areas of the country.

Any case, before concluding it under Battered Baby Syndrome, should be thoroughly investigated and all the possibilities of accidental injuries should be ruled out so as to avoid unnecessary harassment of an innocent.

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A New Way to Resist Rape

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Abstract

In a case of sexual assault, rape was prevented by biting of portion of the tongue of the accused by the victim. This case is reported to highlight an almost unheard-of measure the victim's girl adopted to prevent rape.

Key words: Rape, Resistance to rape, Rape prevention.

Introduction:

Rape has been treated through history with silence. People find it difficult to talk about and the police and legal system find it equally difficult to deal with. Professionals often avoid rape cases because of the paraphernalia of the judiciary system.

Sexuality is a topic which is not to be disclosed in modern Indian society. Much attention has been given to the changing role of women in our society in areas like equality in employment and in the family. Much less attention has been given to the fundamental way in which the rights of women are violated through sexual assault. From prehistoric times, rape has played a conscious process of intimidation by which men keep women in fear[1]. There is no doubt that in our society males have more power and status than females. It has been suggested that men's possession of greater power contributes to the rape of women.

According to the data of The Ministry of Home Affairs, National Crime Records Bureau(2004), Crime in India 2002, New Delhi, 16496, 16075, and 16373 cases of rape have occurred in our country in the year 2000, 2001 and 2002 respectively..

In many western countries school-going children and teenagers are taught self-defense skill applicable in rape resistance. Sexual assault is a serious problem, particularly for the young, and forceful resistance can be effective in preventing rape. Self-defense training can also contribute to psychological health. Even when resistance does not prevent rape, it can yield important benefit. A woman who does not resist may not be viewed as sympathetically nor her trauma be treated as seriously as one who does fight back, because nonresistance may be viewed by others as consent on the part of the victim.

Case Report:

An accused person of sexual assault was brought to the Dept. of FSM, Medical College, Kolkata for examination. He was a twenty seven yr old male person..He was an employee of a private farm which was situated some 60 KM away from his

residence. History revealed that a married woman, a school teacher with a child used to stay in his locality. Her husband used to work in a far-away place and she had to stay there mostly alone. The victim used to take help from the accused as well as his friends of the locality in different matters from time to time.

On the day of the incidence the accused came home from his working place after 15 days. During the night he went to the victim's house. The door at the backside of the room in which she was sleeping was kept open as it was a very hot night. He crossed over the boundary wall and entered into the house. As he found her sleeping on her bed he jumped over her and started to assault her sexually. The victim first tried to thwart his approach by shouting and physical resistance. Then as he introduced his tongue in her mouth in an attempt of forced kissing, she bit off portion of his tongue with her teeth. The accused began to bleed profusely. By the time the neighbours woke up and came rushing to the spot, the accused fled away.

Examination which was done 5 days after the incidence revealed a raw ulcerated area 1x 2/3" on rt. lateral aspect of tongue with distal portion of rt. half of the tongue missing. There was no other injury and the subject was sexually potent.

Discussion:

Rape resistance is a poorly researched area. While the effects of rape on the individual have been described

and fairly good data are available on the prevalence of sexual assault against women, not much research has been done on the use and effectiveness of various anti-rape strategies adopted by the victims. Probably assault survivors, even those who resisted successfully, are reluctant to share their experience with strangers including the researcher[2].

Women are often advised to use non-aggressive strategies against sexual assault[3]. Research suggests that this is a poor advice. According to one study, women who used non-forceful verbal

strategies, e.g, crying or pleading with the assailant were raped about 96% of the time[4].

Forceful verbal resistance, including loud screaming was more effective than non-forceful verbal resistance. These strategies were associated with completion of rape from 44%-50% of the time[5]. Running works even better than verbal resistance. Researches indicate that only 15% of women who attempted to flee were raped[6].

Forceful physical resistance is an extremely successful strategy. The completed rape dropped to 14% when the rapist's attempt was met with violent physical force. Striking was more successful than pushing or wrestling. Physical resistance also appeared to be more effective when assault occurred outdoor[5].

Women who used knives or guns in self-defence were raped less than 1% of the time. Defensive use of edged or projectile weapons reduced the rate of injury to statistical insignificance[7].

While many of these strategies are very successful by themselves, combinations e.g, shouting and fighting or shouting, fighting and running further increase the chances of avoiding rape.

In one study, one third of the 365 women who encountered sexual assault did successfully avoid sexual contact by offering resistance[8].

We know about Lorena Bobbit who severed the penis of her husband by a 8 inches knife after a forceful sexual intercourse.

Conclusion:

Sexual assault is, of course, a complex phenomenon which has no simple solution. As adolescent girls constitute the largest group affected, self-defense training programs may be beneficial particularly at high-school and early part of college level. Rape prevention programs may be implemented which includes discussion and education about rape myths, prevalence of sexual assault, factors associated with sexual assault and sexual assault prevention. In addition, Legal reform, a general change in attitudes, uprooting of rape-supportive myths and much else will be required to permanently reduce the incidence of this crime.

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The accused with portion of his tongue bitten off



Cut penis in Lorena Bobbit case being presented in Court

Age Determination in Girls of North – Eastern Region of India

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Abstract

Epiphyseal union of the elbow, knee, wrist joints and pelvis was studied retrospectively on 104 girls between the age group of 16 -22 yrs to determine the age roentgenographically. Regression formula with the standard errors was derived for the respective joints. The Y-values predicted by the Regression equation may not be valid if they are out side the range of the Y-values used to determine the equation. The present study establishes a reference population for age determination of girls from epiphyseal union in North – Eastern region of India.

Key words: Roentgenographic, age determination, epiphyseal union, regression formula.

Introduction:

Determination of the age of an individual from the appearance and the fusion of the ossification centres is a well accepted fact in the field of medical and legal professions. According to Aggarwal MI & Pathak IC (1957)¹, epiphyses of bones unite during age periods which are remarkably constant for a particular epiphysis. This is possible due to complex but dependable system by which the osseous framework of the body develops, grows and matures. Epiphysis of the bones unite at a particular age and this is helpful in age determination. Determination of age is helpful in both civil and criminal cases. In the living age determination is the most important issue to the court and to the common citizens as well. It is essential to establish the identity of the person at the time of admission to schools, colleges, institutes, or while competing in sports tournaments at regional, state or national levels. It is also important while taking consent or in cases relating to juvenile offenders, rape, kidnapping, employment in Govt. establishments, competency as a witness, attainment of majority, marriage, fixation of criminal responsibility, etc. Extensive work on the determination of age of epiphyseal union has been carried out in different states of India as well as abroad, and from the findings of various workers, it is evident that there is not only difference in the age of epiphyseal union in India and abroad, but also in the different states of India. These differences may be on account of varying genetic and epigenetic factors like climatic, economic and dietetic conditions. The present study was undertaken retrospectively for determination of age in girls of indigenous population of the different North-Eastern region of India from epiphyseal union

around the elbow, wrist, knee joints and pelvis, roentgenographically.

Materials & Methods:

The retrospective study was undertaken on 104 girls between the age group of 16-22 years. Only normal healthy individuals whose exact date of birth was known were included in the study. Only the cases belonging to native population of North-Eastern region of India were included in the study. The cases were collected for schools, colleges, and institutions by obtaining the permission from their respective head of the institution. X-ray of the elbow, wrist, knee joints and pelvis were taken at the Department of Radiodiagnosis, Regional Institute of Medical Sciences, Imphal, Manipur. In the present study, the cases were taken from the groups of girls belonging to the states of Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. From the state of Tripura, only the cases belonging to the tribal community were included in the study. The following epiphyses were examined: 1) At the elbow joint: Medial epicondyle, conjoint epiphysis, and upper ends of radius and ulna, 2) At the knee joint: The lower end of femur and the upper ends of tibia and fibula, 3) At the wrist joint: The lower ends of radius and ulna, 4) At the pelvis: The iliac crest and the ischial tuberosity. A complete history of the past and present illnesses was taken and general physical examination was done meticulously to assess any disease or deformity which may affect the epiphyseal union. Dietary and economical parameters were also noted. The qualified candidates were subjected to x-ray of the bones around the joints mentioned above in anterior-posterior (AP) view. The different phases of fusion were graded arbitrarily into five stages – (i) **Non-**

union: When the epiphyseal cartilage did not begin to decrease in thickness (0 degree union), (ii)

Commence of union: When the thickness of the epiphyseal cartilages was found to be reduced appreciably (1st degree union), (iii) **Incomplete**

union: When the epiphyses have begun to fuse with the shaft and complete union was well underway (2nd degree union), (iv) **Complete union:** When the

epiphyseal cartilage was bony in architecture and its density indistinguishable from the epiphyses and diaphyses in its neighborhood, but an epiphyseal line called epiphyseal scar could still be distinguished (3rd degree union), (v) **Complete union** with absence of epiphyseal scar (4th degree union). In the pelvis, the 0, 1st, 2nd, 3rd, and the 4th degrees of union has been assigned to the non-

union, 25%, 50%, 75%, and complete union of the epiphyses respectively.

Results & Observations:

The present study was undertaken retrospectively for determination of age in girls of indigenous population of the different North-Eastern region of India from epiphyseal union around the elbow, wrist, knee joints and pelvis, roentgenographically.

At the elbow joint, the epiphyses had fused completely with their shafts at the age of 16 years. At the knee joint, 4th degree epiphyseal union is seen in 89.5% of the cases. At the wrist, 21% of the cases showed complete union whereas at the pelvis complete union is seen in 5.263% of the cases (Table-1).

Table-1:
Degree of EPIPHYSEAL Union at 16 years

Degree of EPIPHYSEAL Union	Elbow n=19		Knee n=19		Wrist n=19		Pelvis n=19	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	10	52.63
1	0	0	0	0	1	5.3	2	10.53
2	0	0	0	0	3	16	4	21.05
3	0	0	2	10.5	11	58	2	10.53
4	19	100	17	89.5	4	21	1	5.263
Total	19	100	19	100	19	100	19	100

In 17 years age group, 16 girls showed 4th degree union at elbow and knee joints. At the wrist joint, 81% of the cases showed complete union and at the pelvis, 2 cases (12.5%) showed complete union in girls (Table-2).

Table-2:
Degree of EPIPHYSEAL Union at 17years

Degree of EPIPHYSEAL Union	Elbow n=16		Knee n=16		Wrist n=16		Pelvis n=16	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	6	37.5
1	0	0	0	0	0	0	3	18.75
2	0	0	0	0	1	6.3	3	18.75
3	0	0	0	0	2	13	2	12.5
4	16	100	16	100	13	81	2	12.5
Total	16	100	16	100	16	100	16	100

There were in total 16 numbers of cases in 18 years age group. Complete union is seen at elbow and knee joints. At wrist joint, 100% of the cases showed complete union and at the pelvis, 25% cases showed complete union in this age group (Table-3).

Table-3:
Degree of EPIPHYSEAL Union at 18 years

Degree of EPIPHYSEAL Union	Elbow n=16		Knee n=16		Wrist n=16		Pelvis n=16	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	1	6.25
2	0	0	0	0	0	0	5	31.25
3	0	0	0	0	0	0	6	37.5
4	16	100	16	100	16	100	4	25
Total	16	100	16	100	16	100	16	100

At 19 years, complete epiphyseal union is seen around elbow, wrist and knee joints. At pelvis, 61.54% of the cases showed complete union (Table-4).

Table-4:
Degree of EPIPHYSEAL Union at 19 years

Degree of EPIPHYSEAL Union	Elbow n=13		Knee n=13		Wrist n=13		Pelvis n=13	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	2	15.38
3	0	0	0	0	0	0	3	23.08
4	13	100	13	100	13	100	8	61.54
Total	13	100	13	100	13	100	13	100

Epiphyses around the elbow, wrist and knee joints showed complete epiphyseal union at 20, 21 and 22 years. At pelvis, the girls showed complete union in 78.56% of the cases at 20 years and in 100% of the cases at 21 and 22 years (Table-5, 6, 7).

Table-5:
Degree of EPIPHYSEAL Union at 20 years

Degree of EPIPHYSEAL Union	Elbow n=14		Knee n=14		Wrist n=14		Pelvis n=14	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	1	7.1
3	0	0	0	0	0	0	2	14.28
4	14	100	14	100	14	100	11	78.56
Total	14	100	14	100	14	100	14	100

Table-6:
Degree of EPIPHYSEAL Union at 21 years

Degree of EPIPHYSEAL Union	Elbow n=14		Knee n=14		Wrist n=14		Pelvis n=14	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	14	100	14	100	14	100	14	100
Total	14	100	14	100	14	100	14	100

Table-7:
Degree of EPIPHYSEAL Union at 22 years

Degree of EPIPHYSEAL Union	Elbow n=12		Knee n=12		Wrist n=12		Pelvis n=12	
	No.	%	No.	%	No.	%	No.	%
0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	12	100	12	100	12	100	12	100
Total	100	100	100	100	100	100	100	100

**TABLE-8:
Regression Equation at Different Joints**

Joint studied	Regression Equation Female
Elbow	$18.54+(0)X$
Wrist	$11.58+1.9X$
Knee	$Y=18.74+(0)X$
Pelvis	$Y=15.93+0.89X$

**Table-9:
Standard errors at different joints**

Joint studied	Standard Error
Elbow	4.14
Wrist	1.73
Knee	4.14
Pelvis	1.65

The regression equations for 16 to 22 years age group at different joints to predict ages with given degrees of union is shown in Table-8, where Y is the dependent variable (age) and X is an independent variable (degree of union). The standard errors of various joints are given in Table-9 which corresponds to the different regression equations. There was no appreciable difference in the age of complete union of epiphysis on both right and left side of the body.

Regarding the individual bones of the joints concerned, the ages showing complete epiphyseal union in the 100% of the cases at the earliest has been summarized below:

Conjoint epiphysis	16 years;	Medial epicondyle of humerus	16 years
Upper end of radius	16 years;	Upper end of ulna	16 years
Lower end of radius	18 years;	Lower end of ulna	18 years
Lower end of femur	17 years;	Upper end of tibia	17 years
Upper end of fibula	17 years;	Ischial tuberosity	21 years
Iliac crest	21 years;		

Discussion:

At the elbow joint: Fourth degree epiphyseal union is seen in all the cases. **At the wrist joint:** First degree union is found only in age group of 16 years. Second degree union is found in age group of 16 and 17 years. The third degree is found in 16 – 17 years. Fourth degree is found in 16 – 22 years. **At the knee joint:** First and second degree union is not found in 16 years age group but the third degree union is found in 16 years. Fourth degree union can be seen in all age groups. **At the pelvis joint:** Zero degree union can be seen in 16 – 17 years. First degree can be seen in 16 – 18 years group. Second degree union is found in 16 – 19 years group. Third degree union is seen from 16 years to 20 years age group. Finally, fourth degree union is seen in 16 – 22 years age group. Thus, in pelvis as the age increases, the degrees of union also increase.

Hepworth SM (1929)[2] from his study on Punjabi girls found that the conjoint epiphysis fused with the shaft of the humerus at 15 years. The proximal epiphyses of both radius and ulna fused with their shaft at 15 years in girls. In the present series, epiphyses at the elbow joint showed complete fusion in all the 104 cases by the age of 16 years. However, since the younger subjects below 16 years of age are not studied, it was not possible to find out the exact age of commencement of the epiphyseal union. Lall R and Nat BS (1934)[3] found that the conjoint epiphysis fused with the shaft at 15-16 years whereas the medial epicondyle fused at about 17 years, which is almost similar with the present series. Lall R and Townsend RS (1939)[4] also found that 100% union at elbow joint occurred by 14-15 years. Epiphyseal union below 16 years of age could not be studied in the present series. Kothari DR (1974)[5] found that the distal ends of both radius and ulna fused completely with their shafts at 17-18 years in female, which is in agreement with the findings in our study. Prasad RS et al (1979)[6] and Sahni D (1995)[7] found that the epiphyseal union at the wrist joint has completed by the age of 16 years. Their finding is earlier in comparison to the finding in this present series.

Saksena JS and Vyas SK (1969)[8] stated that the epiphyseal union around the knee joint is completed by the age of 16-17 years in girls which is similar to the findings in this series. Paterson RS (1979)[9] found that lower end of femur and upper end of fibula showed complete epiphyseal union at 16 years in girls similar to the finding in this study. Harrison RJ (1972)[10] in Cunningham's textbook of Anatomy, documented that the distal ends of both radius and ulna fused at about 20-22 years, which is much later than the finding in this study. Regarding the knee joint, all the cases showed complete union

(4th degree) of all the epiphyses at the age of 17 years. Out of 104 cases, 4th degree union is seen in 89.5% of the cases by 16th year. Like in other joints the commencement of the epiphyseal union could not be studied. Standring S (2005)[11] stated that the upper end of tibia fused with the shaft at about 16 years in female. The upper end of fibula fused at 17 years in female. The lower end of femur fused with the shaft at 16 years in female. Similar findings are seen in the present series. Dasgupta SM et al (1974)[12] found that lower end of femur and upper end of tibia showed complete epiphyseal union at 17-18 years in girls. The proximal epiphysis of fibula showed fusion at 20-21 years in girls. In his study the cases of recent epiphyseal union, where a white transverse line was still seen in place of the epiphyseal cartilage, was also taken as complete union and the so-called epiphyseal scar was disregarded. In the present study, the epiphyseal union is somewhat earlier than his observation.

In the pelvis, the epiphyseal union for the iliac crest and ischial tuberosity were studied. In the girls, 4th degree epiphyseal union at the pelvis has completed by the age of 21 years. The number of cases (in percentage) showing 4th degree union at 16, 17, 18, 19, 20, 21, and at 22 years are 5.263%, 12.5%, 25%, 61.54%, 78.56%, and 100% respectively. Hollinshead WH (1969)[13] documented that the iliac crest and the ischial tuberosity fused to the main mass by the age of 20-21 years. This is in support of the present series. Sankhyan S et al (1993)[14] also found that the iliac crest fused with the mass, ilium at the age of 21.5 years. This is similar to our finding. Bennet KA (1993)[15] found that epiphysis on iliac crest fused completely by the age of 23 years, and the epiphysis on ischium at 24-25 years. In the present series the age of complete epiphyseal fusion is much earlier. The correlation coefficient is 0.58 in girls respectively. Regression equation is $Y=15.93+0.89X$ with a standard error of 1.65. According to various workers, the time of union of epiphyses varies with geographical distribution, and differences in dietary and hormonal factors. Regarding the North-Eastern region of India, the genetic and epigenetic factors like dietary and geographical distributions may play a role in the age of epiphyseal union. Different workers used different criteria for epiphyseal union and for generalization. Dasgupta SM et al (1974)[12] used the group showing 100% union at the earliest as the criteria for generalization. Lall R and Nat BS (1934)[3] and Lall R & Townsend RS (1939)[4] used 75-90% union as the criteria for generalization. In the present series, the age group showing 100% union at earliest was taken as the criteria for generalization. Therefore, the difference in selecting the criteria for

generalization, and difference in the methods used for staging the epiphyseal union, may play a role in the variations of results and observations of various workers. Further studies involving a larger number of cases of a wider age range, and following uniform roentgenological criteria of epiphyseal union and generalization of the results, are strongly indicated. The study must be pursued further!

Conclusion:

There was no appreciable difference in the age of complete union of epiphyses on both right and left side of the body. By the age of 16 years the epiphyses around the elbow joint are completely fused. At the wrist joint the complete union of epiphyses is seen at the age of 18 years. At the knee joint the epiphyses shows complete union at the age of 17 years. At the pelvis, the epiphyseal union is completed by the age of 21 years. Since the cases below 16 years are not included in the study, the commencement of the epiphyseal union could not be studied. Regarding the correlation between the ages and the degrees of union, among the joint studied, there is zero correlation in case of elbow joint and the knee joint. Therefore suitable Regression equation could not be formulated for these joints. Other joints show moderately positive correlation. The Y-values predicted by the Regression equation may not be valid if they are outside the range of the Y-values we used to determine the equation. The age of a person can be determined by using the following Regression equations given below for the age group of 16-22 years:

Wrist: $Y=11.58+1.9X$ with a standard error of ± 1.73 , Pelvis: $Y=15.93+0.89X$ with a standard error of ± 1.65 . Further studies must be pursued further!

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The Responsibility on the Shoulders of Courts and Doctors to Provide Proper Legal Protection to Rape Victim

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Abstract

Rape is not only a crime against the person of a woman; it is a crime against the entire society. It destroys, as noted by the Supreme Court [1], the entire psychology of a woman and pushes her into deep emotional crisis. It is a crime against basic human rights, and is also violative of the victim's most cherished of the Fundamental Rights, namely, the Right to Life contained in Article 21 of the Constitution of India, 1950. The low rate of convictions in cases of rape raises serious questions about the workings of the law. The amendments seem to have had little effect and merit closer examination. There is reluctant recognition of the amendments and its swamping under pre-conceived notions. After more than two decades since legal reforms gave rape victims more leverage in the courtroom; we need to change society's attitude towards rape.

Introduction:

It is unfortunate that respect for womanhood in our country is on a decline and cases of molestation and rape are steadily growing. Decency and morality in public and social life can be protected only if courts deal strictly with those who violate the social norms.

Sexual violence apart from being a dehumanizing act is an unlawful intrusion on the right of privacy and sanctity of a female. When a woman is ravished, what is inflicted is not merely a physical injury but the deep sense of some deathless shame. The physical scar may heal up, but the mental scar will always remain.[2] The offence of rape is in simplest term is 'the ravishment of a woman without her consent by force, fear, of fraud' or as 'the carnal knowledge of a woman by force against her will'. While the murderer destroys the physical frame of his victim, a rapist degrades and defiles the soul of a helpless victim.[3]

To insist on corroboration except in the rarest of rare cases is to equate one who is a victim of the lust of another with an accomplice to a crime and thereby insult womanhood. Corroboration is not the sine quo non for conviction in a rape case. Refusal to act on the testimony of the victim of sexual assault in the absence of corroboration as a rule is adding insult to injury.

The amendments:

The alarming frequency of crime against women led the parliament to enact Criminal Law Amendment Act 1983 (act 43 of 1983) to make the law on rape more realistic. By this act, sections 375 and 376 IPC were amended and certain more penal provisions were incorporated for punishing such custodians who molest a woman under their custody or care. Section 114A IEA was also added in the Evidence

Act for drawing a conclusive presumption as to the absence of consent in certain prosecutions for rape, involving such custodians. Section 327 of the Code of Criminal Procedure which deals with the right of the accused to an open trial was also amended by the addition of sub-sections (2) and (3).[4] The amended provisions of the Section 327 Criminal Procedure Code impress upon the Presiding Officers to hold the trial of rape cases 'in camera' rather than in open court.

When the sexual intercourse is admitted by the accused but with consent, but victim states in her evidence before court that the act was done without her consent; then the court will presume that she had not given the consent as per amendment 114A Indian Evidence Act in cases of custodial rape. So admitting sexual intercourse with consent is suicidal for the accused.

The offence of rape occurs in Chapter XVI of the Indian Penal Code. It is an offence affecting the human body. Sections 375 and 376 have been substantially changed by Criminal Law (Amendment) Act 1983 and several new sections were introduced by the new act, i.e. 376-A, 376-B, 376-C and 376-D. The fact that sweeping changes were introduced reflects the legislative intention to curb with iron hand, the offence of rape which affects the dignity of a woman.

In view of the object of preventing social victimization or ostracism of the victim of a sexual offence for which the section 228A Indian Penal Code has been enacted. It makes the disclosure of identity of a victim punishable. The name of the victim is to be suppressed. The printing or publishing of any matter which may make known the identity of the victim can be punished.

Section 164A Criminal Procedure Code has been added by Amendment Act 2005 to provide for a medical examination of a rape victim by doctor employed in government hospital and in absence of such, victim can be examined by any other private doctor whose name is entered in the state medical register.

The legislature brought about an amendment in by Act 4 of 2003 (sec. 3) by inserting a proviso to section 146 of the Indian Evidence Act 1872 that in a prosecution for rape it shall not be permissible to put questions in the cross-examination of the victim with respect to her moral character. This led to the deletion of the section 155 (4) of the Indian Evidence Act in 2003, whereby the 'generally immoral character' of the victim cannot be a ground raised by the accused for rape.

Duty of doctor in rape cases:

Examination of the rape victim should be carried out as early as possible without any delay with consent preferably by a lady doctor as per the s. 164A CrPC which is binding force on the doctors.

History taking in the case of medicolegal reports especially rape cases should be avoided. It is a means of harassment for causing humiliation to the victim of crime. A victim of rape has already undergone a traumatic experience and if she is made to repeat again and again in unfamiliar surroundings what she had been subjected to, she may be too ashamed and even nervous or confused to speak and her silence or a confused stray sentence may be wrongly interpreted by the court as discrepancies and contradictions in her evidence.[5] In a case in Delhi High Court [6] it was submitted that even in the MLC it is recorded that according to the victim 'somebody' raped her and there is no mention of the accused. The document was prepared by a doctor who may or may not have found it necessary to mention the name of the alleged rapist particularly since he was the stepfather of the victim. In the same case doctor did not notice any bloodstains on the victim's clothes, but the Investigating Officer did notice and this discrepancy cropped up in the case.

The doctor shall forward the report without delay to the Investigating Officer noting the exact time of commencement and completion of the examination.[7] However in the famous Mattoo case [8] the parcel of clothes of the victim, the vaginal swabs and the slides as per post mortem report were handed over the Inspector Lalit Mohan on 25-1-1996 after the conclusion of post-mortem. The report was definite and categorical about handing over of the articles on 25-1-1996. However in the court, police deposed that the said parcels were collected from the doctors on 29-1-1996. There is no

explanation as to what happened or in whose possession the articles were from 25-1-1996 to 29-1-1996 and so the possibility of tampering with the articles could not be ruled out. The findings of the trial court acquitting the accused were justified. It is the duty of the doctors and the police to maintain the chain of custody in such cases. In this case the trial court has rejected the DNA test and the found the doctor Dr.G.V.Rao of CCMB Hyderabad not to be a trustworthy witness.

It has been repeatedly held by the Supreme Court that the name of the rape victim should not be disclosed. Mentioning the name of the victim in any publication, paper, book, giving news item in press conference by the doctor; is not only contrary to the views expressed the Supreme Court but also contrary to the statutory law under s.228A Indian Penal Code which makes it punishable with imprisonment for two years and fine. However it has been seen that author of book like Textbook of Forensic Medicine and Toxicology – Principles and Practice [9] is not conscious of the amendment or do not realize its importance in showing the face and genital area in photos with name and address thus disclosing the identity of the victim of sexual offence. In view of writ petition [10] before the High Court, in case of victim of sexual offences, the publication of photographs of such victims in newspapers, journals and magazines would fall under category of making disclosure of identity of victim and thereby such act would fall under s. 228A IPC. Circular dated 15-7-2002 issued by Director General of Police to stop permitting women victims of violation being photographed. The High Court has taken a serious view of the matter, and has ordered it to be implemented by all the police officials in letter and spirit; so that the guilty may be brought to the book.

There have been instances [11] where the Courts have set aside the conviction and acquitted the accused, solely on the ground that the victim was medically examined but the doctor who examined her did not come in the witness box to prove the report and the prosecution did not take care to examine the lady doctor. Even serologist report was on the record but the same was not proved. The High Court was of the opinion that non-examination of the doctor and non-providing of an opportunity to the accused person to cross examine the lady doctor is a fatal one and is a great lacuna in the prosecution case. On the basis of this view the High Court acquitted the accused on benefit of doubt.

As per the Section 204 Criminal Procedure Code, regarding attendance of the witness, in event of non-compliance with the process, it would be the functioning of the court to compel attendance of the doctor. As per Constitution of India, Article 21,

Expeditious disposal does not mean that evidence, whether prosecution or defence, should be cut short and judgment be pronounced without examining material witness. Procedural law is required to be adhered to. Magistrates have been directed to issue summons to witnesses concerned at new and correct address.[12] However if unsuccessful, then he shall resort to other coercive measures.

Duty of judiciary in rape cases:

It has been repeatedly held by the Supreme Court in various judgments [13,14] that the name of the rape victim should not be disclosed. Of course if it is absolutely unavoidable as for example when framing the charges against the accused, the identity of the victim may be disclosed but not otherwise. The Supreme Court has observed that the name of the victim has been mentioned in many judgments by the trial courts. This is not only contrary to the views expressed by the Supreme Court but also contrary to statutory law (228A IPC). The Supreme Court has directed the trial courts that when they are dealing with the cases of the sexual offences the name of the victim should not be disclosed.[15] The Punjab & Haryana High Court circulated a copy of judgment *Angej Singh v. State of Punjab (P&H) 2007 (1) RCC 235* among the learned session judges working in the states of Punjab and Haryana for strict compliance of the observations of the Apex court while interpreting section 228 A (1) IPC and to make the trial court conscious of the amendment.

Section 327 (2) and (3) of Criminal Procedure Code are in the nature of exception to the general rule of open trial, in spite of the amendment, however it has been seen that the trial courts either are not conscious of the amendments or do not realize its importance for hardly does one come across a case where the trial of rape case has been conducted by the trial court 'in camera'. It casts a duty on the court to conduct the trial of rape cases etc. invariably 'in camera'. The courts are obliged to act in furtherance of the intention expressed by the legislature and not to ignore its mandate and must invariably take recourse to the provisions of Section 327 (2) and (3) CrPC and hold the trial of rape cases 'in camera'. Trial in camera would not only be in keeping with the self-respect of the victim of crime and in tune with the legislative intent but is also likely to improve the quality of the evidence of a victim because she would not be so hesitant or bashful to depose frankly as she may be in an open court under the gaze of public. The improved quality of evidence would assist the courts in arriving at the truth and sifting truth from falsehood.[16] The Privy Council in 1913 has clearly held that the evidence of the victim may be recorded in an open court, after taking all the precautions, after sending the general public, press

and other persons, including junior advocates of the defence counsel.[17]

The court should not sit as a silent spectator while the rape victim is being cross examined by the defence. It must effectively control the recording of evidence in the court. The court should ensure that cross examination is not made a means of harassment or causing humiliation to the victim of rape. It has been observed that the rape victims are put some rather strange, embarrassing and unwanted questions. The trial judges must appreciate that the purpose of cross-examining a victim of rape is not to humiliate her but to get to the truth of the matter. Consequently questions which have no real relevance to the issues before the court and which are apparently directed to cause discomfiture, if not humiliation, to a victim of sexual offences, should not be permitted. Such questions do not serve the ends of justice and it is pointless allowing any such cross-examination to take place.[18]

The Supreme Court expressed strong disapproval of the approach of the trial court and its casting a stigma on the character of rape victim. Such observations lack sobriety expected of a judge. Even in cases where there is some acceptable material on record to show that the rape victim was habituated to sexual intercourse, no such inference like the victim being a girl of 'loose moral character' is permissible to be drawn.[19] No stigma should be cast against such a witness by the courts, for after all it is the accused and not the rape victim who is on trial in the court. The Supreme Court observed that the trial court should not search for contradictions and variations in the statement of rape victim microscopically, so as to disbelieve her version.

Wherever possible it may also be worth considering that the cases of sexual assault on female are tried by lady judges [20] wherever available so that the victim can make her statement with a greater ease and assist the courts to properly discharge their duties without allowing the truth to be sacrificed at the altar of rigid technicalities while appreciating evidences in such cases. [21]

The Courts are expected to deal with cases of sexual crime against women with utmost sensitivity. A socially sensitized judge is better statutory armour in cases of crime against women than long clauses of penal provisions, containing complex exceptions and provisos.[22] The legislative wisdom reflected by the statutes has to be respected by the courts and the permitted departure there from made only for compelling and convincing reasons.

Conclusion:

The entire gamut of delays in lodging FIRs, delays in medical examinations, material contradictions in statements made to the police and testimonies in court remain prime factors in the accused's defence. When the victim takes U-turn while giving evidence against the accused then the courts become helpless and the accused is acquitted as the prosecution fails to prove the charges against the accused; which leads to the low conviction rate in such cases. To cover such deficiencies the statement of the victim should be recorded by a magistrate under section 164 CrPC. When the victim is brought to the hospital in serious condition, the dying declaration must be recorded. This will help the court to convict the accused where all the witnesses become hostile including the victim. Shall the rapist be sentenced to death or not? Opinion may be divided as far as the type of punishment to be given, but everyone undisputedly wants the culprit of the heinous crime should not be allowed to go unpunished. Experience however tells that the definition of rape is not perfect and there are lacunas of which the accused takes advantage. Thus the accused of such a heinous crime as rape escapes unpunished and moves in the society holding his head high. On the contrary the woman although being the victim of physical, mental and sexual exploitation is regarded as characterless, dissolute and promiscuous woman. She suffers life long humiliation, in most of such cases she commits suicide, and children born out of such incidents are also regarded as illegal and looked down upon in the society. The need of the hour therefore is to close

the narrow passage through which the accused succeeds to escape. The makers of India's Destiny have left enough loopholes and lacunae to find an escape with little inconvenience. If the amendments are put to reality then they will provide proper legal protection to rape victim and it will be practically impossible for the rapist to escape punishment.

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Medico Legal Diagnosis & Pattern of Injuries with Sharp Weapons

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Abstract

Out of one hundred cases examined in GGS Medical College Faridkot during the period from July 2006 to September 2007 who sustained injuries with sharp weapons, majority (58%) were in the age group of 21-40 years, males (92%) with simple injuries (80%) and with light sharp weapons. Upper limbs were the parts of body with injuries in majority (47%) of cases followed by head (17%) and mixed type (14%). Nature of injury was homicidal in 60% cases followed by 34% cases with fabricated or strongly suspected fabricated injuries. This is a retrospective study to document pattern of injuries with medico-legal diagnosis to ascertain the type of injuries in the disbursement of justice.

Key Words: Indian Penal Code, Dangerous weapon, Grievous hurt, Expert witness, Indian Evidence Act, Fabricated injury, Defence wounds.

Introduction:

Under Sections 324 & 326 of Indian Penal Code, 1860 instruments for cutting causing sharp injuries on human body have been described as dangerous weapons and the punishments for causing grievous hurt with these weapons is more than resulting in simple hurt or grievous hurt without using dangerous weapons on human body.(1) From the medico legal point of view, every injury recorded by the doctor who has examined the injured, is important and needs to be medico legally diagnosed in the right perspective in the disbursement of justice as a doctor is an "expert witness" in a court of law as per section 45 of Indian Evidence Act, 1872 (2) The detailed and accurate record of the injuries and other relevant particulars of the injured noted during medico legal examination, form the basis of medico legal diagnosis and epidemiological observations in the criminal justice system.

Observations:

Important observations in the study of the 100 cases examined in the causality department of GGS Medical College Faridkot with injuries sustained from sharp weapons were:

1. Age wise distribution of cases:

- a. 0-20 years: 12%
- b. 21-40 years: 58%
- c. 41-60 years: 28%
- d. Above 60 years: 2%

Maximum incidence of cases was in the younger age group of 21-40 years followed by middle aged generation and minimum incidence in the extremes of life.

2. Sex wise distribution of cases:

- a. Male: 92%
- b. Females: 6%

- c. Male Child: 2%

The incidence was more than 15 times in males than to females.

3. Type of weapon:

- a. Light sharp: 92%
- b. Heavy sharp: 7%
- c. Pointed weapon: 1%

In majority of cases the type of weapon used was light sharp.

4. Nature of Injuries:

- a. Simple: 80%
- b. Grievous: 10%
- c. Simple & grievous: 7%
- d. Dangerous: 3%

The incidence of simple injuries was eight times compared to grievous injuries.

5. Type of injuries

- a. Homicidal: 60%
- b. Fabricated: 34% (or strongly suspected to be fabricated)
- c. Dangerous: 6%

The number of cases with fabricated or strongly suspected fabricated injuries was much higher than expected being self suffered or self inflicted to support a false charge of assault with weapons described as dangerous under Sections 324 & 326 of IPC and to enhance the gravity of false charge.

6. Distribution on body parts:

- a. Upper limbs: 47%
- b. Head: 17%
- c. Face & Neck: 6%
- d. Chest: 2%
- e. Back: 5%
- f. Chest & back: 1%
- g. Lower Limb: 8%
- h. Mixed parts: 14%

Peripheral non vital parts of the body including upper & lower limbs and back were involved in majority (60%) of cases followed by injuries on the body parts with vital organs underneath in more than 20% cases.

Discussion:

In all Government hospitals a medical officer or a casualty medical officer may be asked to examine an injured person. The details of this examination must be entered in an Accident Register which is a confidential record and if required by a court of law has to be produced in the Court. [3] Offences of a widely differing nature may be inflicted with widely different instruments in infinity of ways, and demand a consideration of certain general principals before the examination of each in detail. The character of an injury caused by some mechanical force are dependent on the nature and shape of the weapon, the amount of energy in the weapon or instrument when it strikes the body, whether it is inflicted upon a moving or a fixed body and the nature of the tissue involved.

Sharp cutting instruments result in incised wounds i.e. a clean cut through the tissues, usually skin and subcutaneous tissues, including blood vessels. Blood escapes freely through the wound to the surface and the incised wounds have length rather than depth and tend to gape.

The pattern of injury is of great importance in determining whether the wound is self-inflicted or not. Self-inflicted wounds show obvious deliberation and although they are occasionally inflicted in an attempt to achieve publicity, their pattern will be similar to that seen in deliberate attempts at self-destruction.

Non-fatal self-inflicted incised wounds are not uncommon in cases where suicide has been achieved by some other means. Cutting one's throat is a form of suicide more common in men than women. Most commonly the preliminary non-fatal injuries consist of a number of superficial incisions across the front of the wrist but they may appear elsewhere on the body. The characteristic features are that the cut area is bared, the wounds are usually tentative in nature, multiple and parallel, or in parallel groups. Another feature of self-inflicted incised wounds is that the clothing is removed from the part of the body which is injured and no damage is done to features. Defence wounds are not uncommon upon victims of assaults with sharp penetrating or cutting instruments. They arise when the victim attempts to defend and are common on the palmer surfaces of hands when there has been an attempt to grab the weapon or upon the arms when the victim has attempted to ward off the weapon[4] Incised wounds are usually suicidal, then

homicidal and only occasionally accidental. Self-inflicted incised wounds are superficial, multiple, grouped together, parallel to each other, placed on the approachable parts of the body, more commonly on the anterior aspects of the forearms. Inner aspects of thigh and lateral aspects of upper arms and the wounds are directed towards centre of the body. Homicidal incised wounds may be on any part of the body, including the unapproachable parts. More than one severe wound at more than one site is common. Accidental wounds may be present anywhere on the body and may be of any severity. There is no mark of resistance on the body or no sign of struggle at the place. [5]

Many doctors are ignorant of the legal outcome of their medico legal reports. Ignorance of law excuses no man, not all men know the law, but because it is an excuse every man can plead, and no one can refute him. The law may be an ass, but more often it makes an ass of those who try to circumvent it. [6] In assault cases, apart from detail of injuries sometimes description of pattern of tears in apparel is a valuable tool to ascertain the weapon of offence an examination of apparels is very valuable clue to ascertain the weapon of offence. [7] Cut throat is not a very common method preferred for committing suicide. Homicidal cut throat is more commonly seen in our country. The common methods used for committing suicide in our country are hanging, poisoning, burns, jumping from height, drowning, firearms, stabbing etc. Suicidal incised wounds are found most commonly in the neck and are usually associated with hesitation cut wounds. [8] Modern criminal investigation is teamwork of several experts working in close collaboration with law enforcing agencies with common objectives to arrive at the truth. The role of forensic expert is to help in the administration of justice. The qualities needed in forensic expert is qualification, training & experience to identify the problem with professional knowledge, observe accurately and interpret the results properly so as to form a scientific conclusion and to furnish opinion on his findings.[9] The increasing criminal behaviour of the injured, the easy access to courts, as well as easy availability of legal assistance has brought new dimensions to the medico legal work and the legal expectations from a medical man, therefore, have also changed in equal proportions.[10] Medical officers are to be trained for how to write a "certificate" or "report", so that all the supporting facts to conclude the opinion are mentioned properly and with possible scientific deviation and limitation without giving undue weightage to the observed facts.[11]

Conclusions:

1. A forensic medicine specialist being an expert witness should be able to diagnose the medico legal injuries in their right perspective to help the investigating authorities and the courts of law for their logical conclusions.
2. Apart from playing the role of an expert witness, he must also maintain the comprehensive data pertaining to the injured and the injuries for epidemiological records to assist in the surveys pertaining to the crimes on humanity for behavioural treatment of the criminals and the assault victims.
3. Injuries caused by or sustained from sharp edged weapons may be suicidal, homicidal, self-suffered, self-sustained or accidental but certain medico legal parameters definitely help to diagnose the nature or mode of these injuries.

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Sudden Death during Sport Activities: A Malaysian Perspective

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Abstract

This is a retrospective study of sports related deaths on the human bodies brought for autopsy in the last 10 years (from 1995-2005) at University Malaya Medical Center (UMMC), Kuala Lumpur. The objective of this study was to know the cause of death, manner of death, ethnicity, food habits, timings of incident, number of cases and other related information like history of metabolic disorders or any other underlying diseases. All cases were analyzed in relation to age, gender, race, causes of death, type of sport activities and victim's profile. The present study included those subjects who had died either during playing or immediately after it. Our results showed the most common age group affected in such sports related sudden deaths to be ranging between 40 – 49 years and the least affected were between 0 – 9 years of age. Out of 44 cases reanalyzed, 33 were male and 1 was female. Among the ethnic group, most of the subjects were Chinese (45.45 %) followed by Malays (20.45%). This study also showed that 80% of the deaths were caused by ischemic heart disease IHD (50%) or coronary heart disease CAD (30%). Deaths were seen to be more in the subjects above 30 years of age which could be associated with the associated risk factors related to ageing. A significant number of deaths were observed while playing badminton and jogging. No serious need for mass screening was felt as the numbers of cases each year were not significant and they were isolated incidents. Although, there are few basic preventive measures like cardiac screening, lipid profile, avoidance of stressful working conditions which can be easily adopted to decrease loss of life. Incidence may decrease with recreational and health maintaining activities, but absolute prevention may still not be possible.

Key Words: Sudden death; Sports activities; Causes of death; Types of sport activities; Family history; Risk Factors.

Introduction:

Sudden death is defined as "an abrupt unexpected death of pathological or idiopathic cause, in which death occurs within 1 to 12 hours of onset of symptoms" (1, 2). The majority of sudden deaths in this study occurred during or immediately after exercise (game, conditioning, training, etc). Autopsy is most often the only means in making a definitive diagnosis and for determination of the cause of sudden death.

Sports are often regarded as a part of lifestyle owing to the widely held perception that it better health and life in whole. The possibility of those indulge in sports to be susceptible to sudden death often seems to be ironic and counter intuitive. Nevertheless, such sudden catastrophes continue to occur, usually in the absence of prior symptoms.

Attempts to understand the causes of such events regularly revolve around cardiac aetiology and to certain extend other causes. However, studies

regarding these events are not as extensive as in the western regions in which the causative factors may vary given the diverse environment, cultural, social, economical and climatic factors.

In this study, consideration of subjects was based on the following criteria (3):

- Individuals that participated in organized competitive sports
- Individuals that exercised regularly and vigorously
- Physically conditioned persons, e.g. military personnel

Individuals that lead a sedentary lifestyle and exercise infrequently were also included in this study as the circumstances indicate that these subjects were in some points close to the sporting events that led to sudden death. Fortunately, sudden death associated with sports is rare. Its exact prevalence is unknown, since there is no national or regional database to track deaths in these individuals. The largest available studies estimate the risk among high school and collegiate (who are active in sports)

to be between 1 per 100,000 and 1 per 300,000 each year (4, 5, 6). An estimated 50 to 100 cases occur in the United States annually (5, 7). It is worthwhile noting that sudden death is about five times more common in males than in females (4). The incidence increases in persons over 35 years of age, largely because of the increasing prevalence of atherosclerotic heart disease. Estimates of the incidence in the older population of joggers or people who exercise vigorously range from 1 per 15,000 to 1 per 18,000 (8, 9)

Sports related death will always be an emotive topic, for it suggests that sports may not prevent the development of heart disease and may actually increase the likelihood of dying suddenly during exercise. Past researches more often than not lay emphasis on cardiac causes of sudden deaths. In this study a broader outlook was adopted to ascertain as many causes and may also serve as an accentuate to the current view of cardiac causes being the major cause of sudden deaths in sports.

Methodology:

This study was conducted retrospectively from the period of 1995 to 2005. Data was obtained from Forensic Pathology Unit, Department of Pathology, Faculty of Medicine, University Malaya, and Kuala Lumpur.

The relevant data were reviewed, and registered in the database and analyzed using SPSS programme covering age, sex, ethnicity, types of sport activities done during collapse, causes of death, and other risk factors. Cross tabulations were performed and significant results were tabulated and charted. Comparisons were made with the relevant past researches and any patterns, similarities or dissimilarities were observed and interpreted. The results were again discussed among group members. Literature search was done again to identify any relevance to other studies. Finally significant results were presented.

Results:

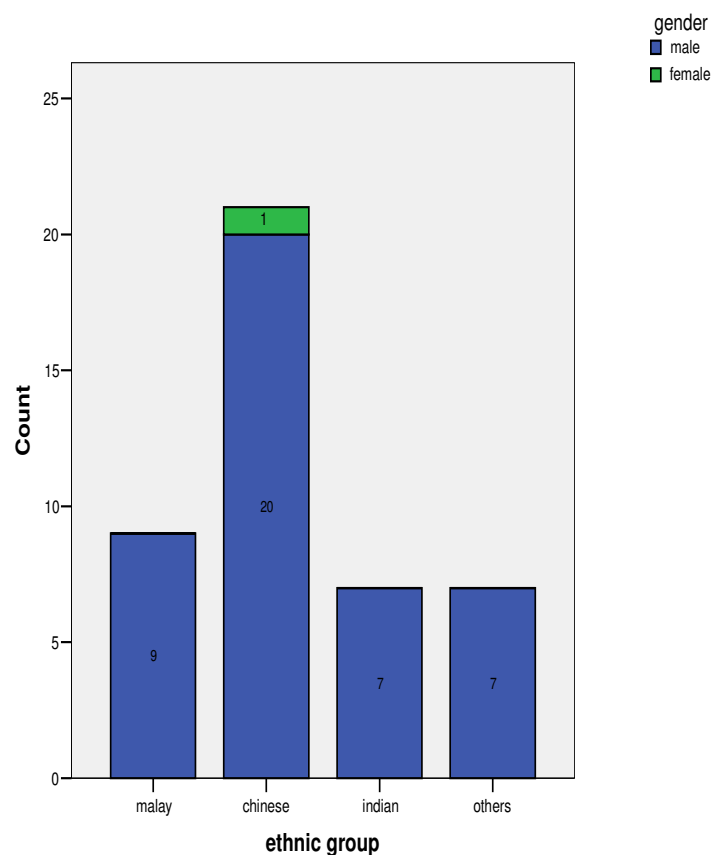
Table 1: Age and sex distribution of sudden deaths during sport activities

		Male	Female	Total	%
Age	0-9		1	1	2.27
	10-19	3		3	6.82
	20-29	4		4	9.09
	30-39	5		5	11.36
	40-49	17		17	38.64
	50-59	14		14	31.82
Total		43	1	44	100

From Table 1, we observed that the highest numbers of victims were in the age group of 40-49 years, with total of 17 deaths (38.64%), followed by in 50-59 years old age group with 14 deaths (31.82%). The minimum numbers of deaths were recorded in age between 0-9 with only 1 case (2.27%).

43 subjects were male and only 1 was female. Amongst the male victims, most of them were in the age group 40-49 year (38.64%), followed by 31.82% subjects between 50-59 years of age. The female victim was from the age group 0-9 years.

Figure 1 : Distribution of different ethnic groups in sports related deaths



In our study, Chinese accounted for the most number of deaths during sport activities with a total number of 21 cases (47.72%) reported in past ten years. Amongst the Chinese, 20 victims were males while only 1 was female. Malays formed the second largest groups of sports related deaths with total of 9 cases (20.45%), and all were males. This was followed by the Indian and Others with each contributing to the same number of cases which was

7. Others included Sikh, non-Malaysians such as Europeans and Indonesians.

Of the 44 deaths occurred during sport activities between the years 1995 to 2005, the number of cases in each year varied. From the bar chart below (Figure 2), the highest number was in the year 2003 with 9 cases (20.5%), followed by 7 (15.9%) in year 1999, 5 cases or 11.4% in the year of 2002, 2004 and 2005 each. The lowest number of deaths was 2 cases which occurred in the year of 1996 and 1998.

Figure 2: Distribution of number of cases according to years in sports related deaths

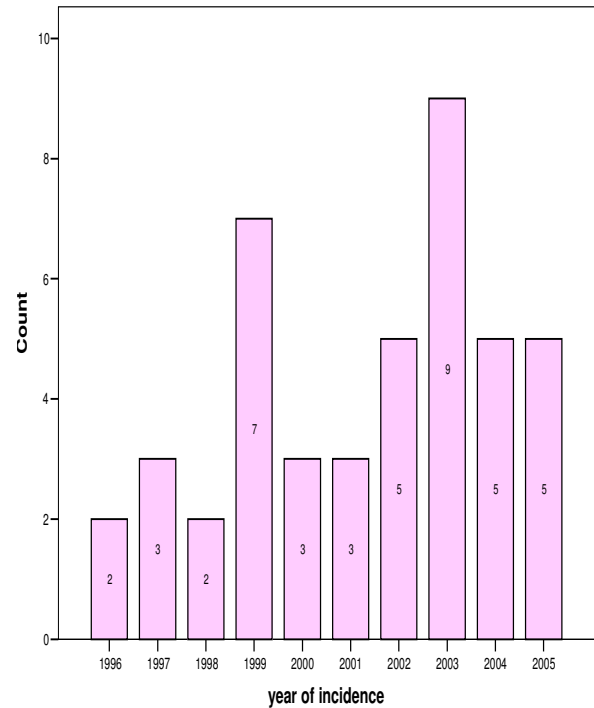


Table 2: Correlation between causes of death and age group distribution of sudden deaths victims during sports activities

		cause of death					Total
		coronary artery disease	acute myocardial infarction	cardiomyopathy	ischemic heart dss	miscellaneous	
age	0-9	0	0	0	0	1	1
	10-19	1	1	1	0	0	3
	20-29	2	1	0	0	1	4
	30-39	3	0	0	2	0	5
	40-49	9	2	0	6	0	17
	50-59	7	1	1	5	0	14
Total		22	5	2	13	2	44

Figure 3: Distribution of causes of death in sports related sudden deaths as mentioned in the autopsy records.

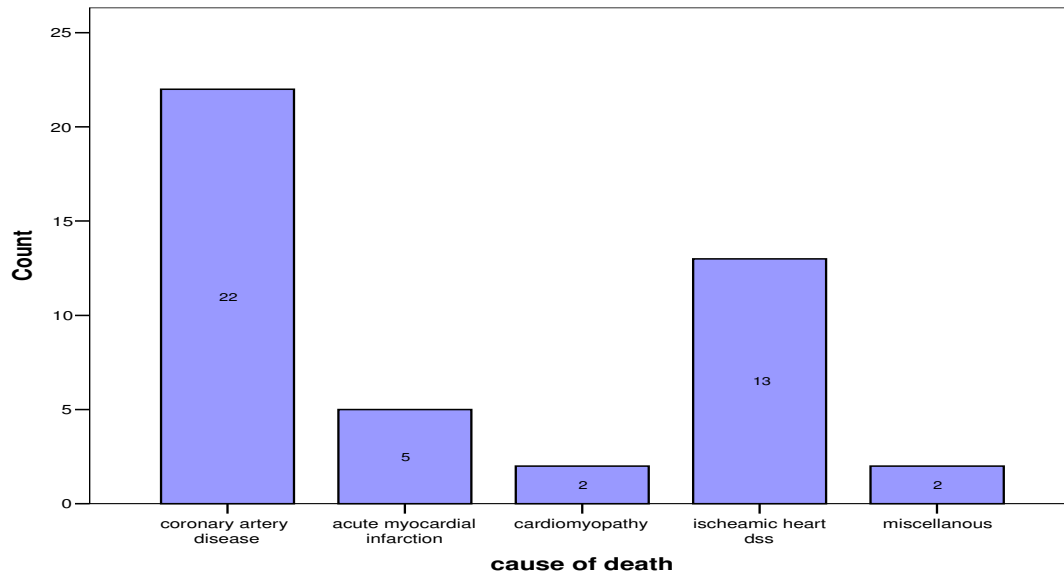


Figure 3 showed that 22 sports related sudden deaths occurred due to coronary artery disease which actually contributes to the highest number of cases in the past ten years. Out of 44 cases, 13 victims died due to ischemic heart disease. Another 5 victims died of acute myocardial infarction. Cardiomyopathy contributed to 2 cases of the total number. Associated miscellaneous conditions such as Klebsella infection and choking have accounted for 2 deaths.

Figure 4: Correlation between causes of death and the specific sporting activity

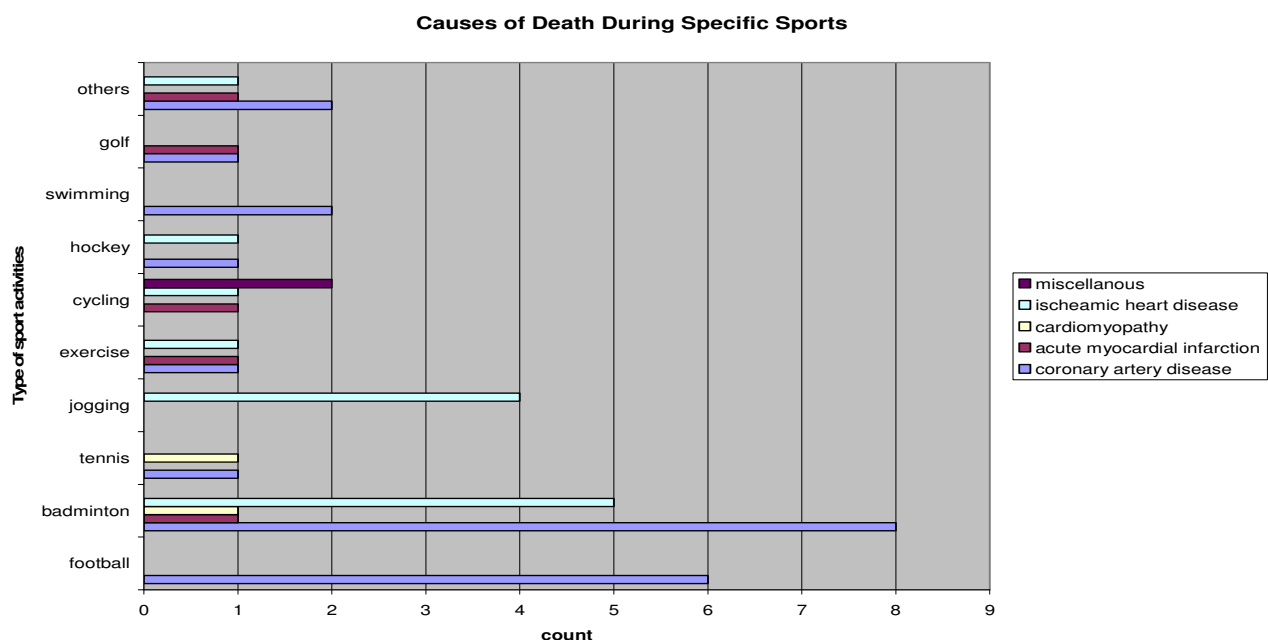


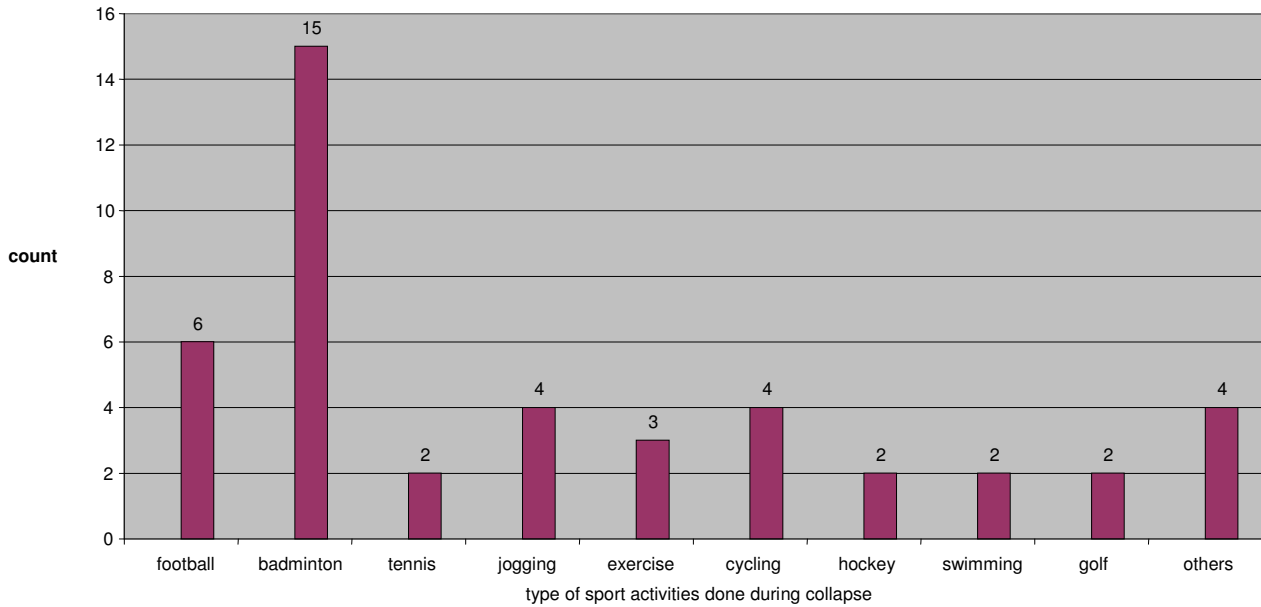
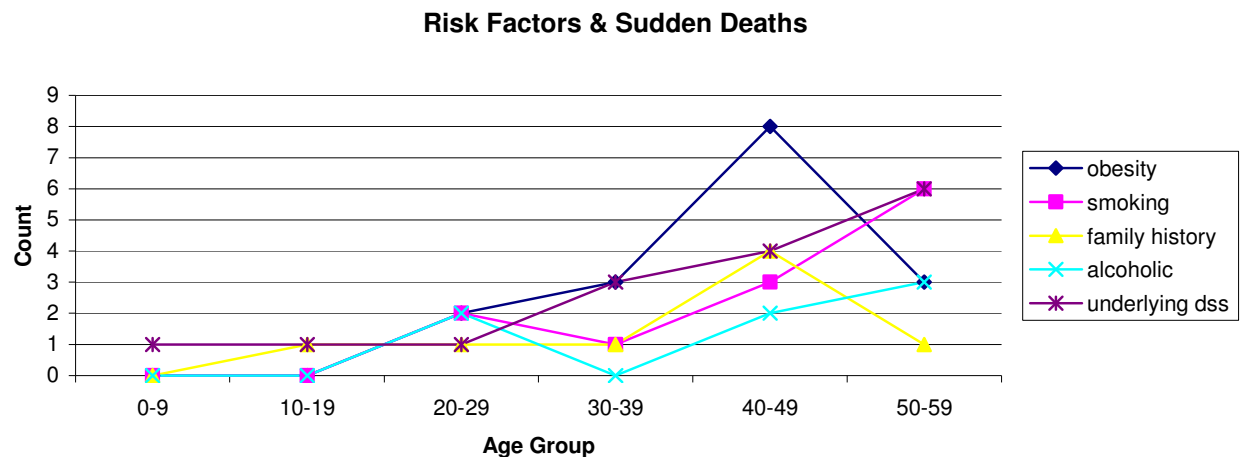
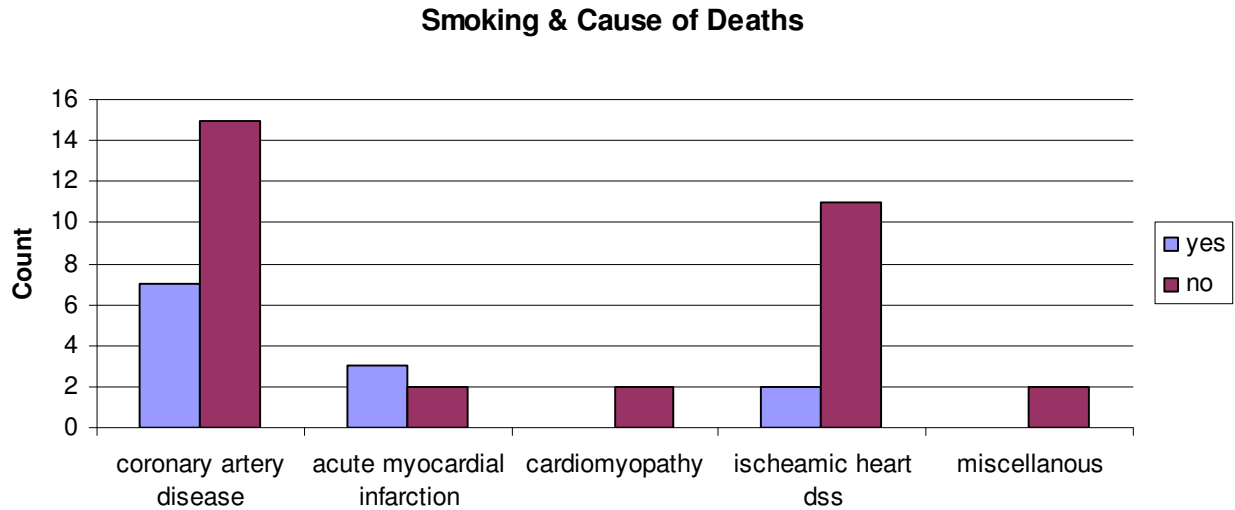
Figure 5: Distribution of type of sport activities done during collapse

Figure 4 depict the relation between deaths and the specific sporting activity. In figure 5, the category 'others' shows only 4 numbers of sudden deaths. Others here include rugby, snooker, squash and playing in water theme park. These activities did not sum up to significant number and presented as isolated cases, often as exclusive cases. 15 deaths occurred while the victims were playing badminton followed by playing football in 6 cases, 4 deaths occurred while jogging and cycling, followed by death during exercising in 3 cases, swimming, 2 deaths each happened while playing tennis, golf and playing hockey.

Figure 6: Distribution of sudden deaths that occurred in cases with associated risk factors

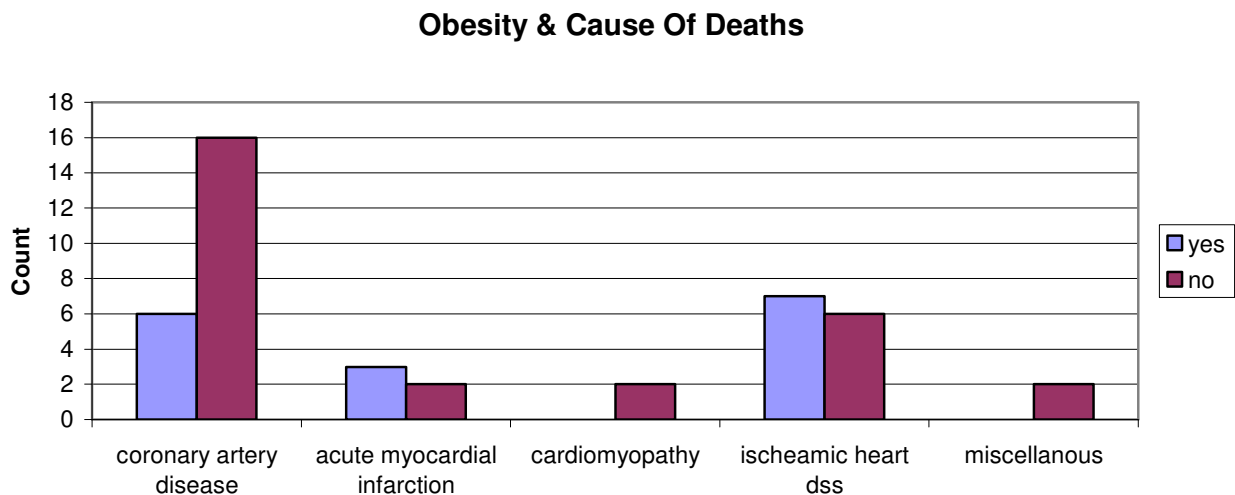
The line graph above concludes that more deaths were seen above the age of 30 years and this may be due to their associated risk factors. Obesity was found to be associated in the highest number of sudden sports related deaths with total of 8 deaths in the age group of 40-49 years.

Figure 7 : The correlation between smoking and causes of sports related sudden deaths.



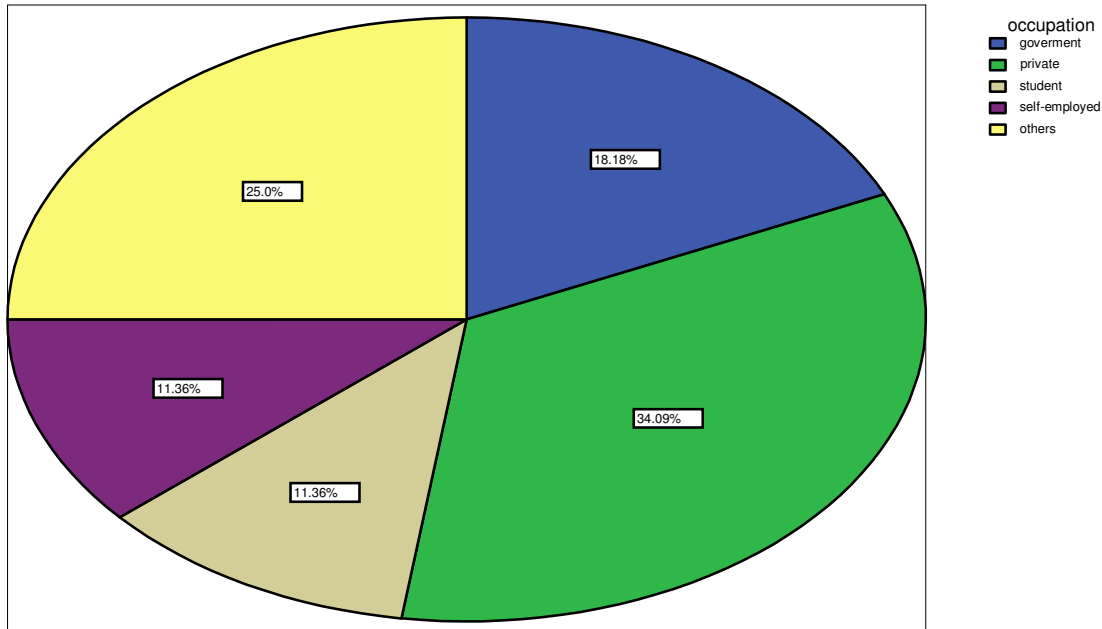
Ironically smoking does not seem to influence the number of sudden deaths. The numbers of smokers were less than the non-smokers who died of various causes of sudden deaths during sporting activity except for only 1 case in which cause of death was acute myocardial infarction. Associated miscellaneous conditions such as Klebsella infection and choking have accounted for 2 deaths and both of them were non-smokers.

Figure 8: Correlation between obesity and causes of sports related sudden deaths.



In our study, we found that the majority of those who died mainly of coronary artery disease were not obese; the number of these cases is 16 compared to 6 cases which were obese. As for cardiomyopathy and miscellaneous causes, none was found to be obese. People who died of acute myocardial infarction and ischemic heart disease were found to be obese with only 1 case more than the non-obese in each cause.

Chart 1: Sports related sudden deaths victim's occupation.



It was found that those who were working in the private sector (e.g., IT personal, manager, and clerk) formed the largest group of victims with the total of 34.09% (15) cases. The second highest group of victims belonged to group where occupation was not known, comprising of 25% (11) cases. This was followed by government sector workers (e.g., forest officer, public health officer) including 8 cases (18.18%). The least number of victims were from self-employed group and students, with the total number 5 deaths in each group.

Discussion:

Few limitations were identified in this study. First, the sampling size was small as only 44 cases had been identified for the past ten years. This is mainly due to the small number of sports related deaths documented in this centre where study was undertaken. The number of cases of sudden deaths during sport activities in University Malaya Medical Center from the year 1995 to 2005 varied each year. The observations are difficult to make any final conclusion as our sample size was small and the limited randomization.

The diagnoses of the cases were based on history noted in autopsy records. Most of the cases were brought for autopsy after collapsing on ground suddenly.

Majority of deaths (38.64%) were found in the age group between 40-49 year old, only 1 case was found in the age group between 0-9. Age group above 30 years contributed to the highest number of sudden deaths and many of them had family history of cardiovascular diseases. Furthermore, most of them were overweight and had the habit of smoking and consuming alcoholic beverages. They were also found to have various underlying diseases.

The high male to female ratio can be attributed to the fact that males are involved in sport activities more frequently than females. In addition, men are known to be more vigorous and mobile when it comes to physical activities. Generally, males are also at a higher risk of cardiovascular diseases and prone for falling into the habits of smoking and alcoholism. These indirectly put males into the higher risk group. Another possible contributing factor is the higher professional involvement of males in sports which puts them in the higher stress scale. Women on the other hand, to a certain extend, are more likely to be at home.

The data collected was restricted to Petaling Jaya and Kuala Lumpur where a significant portion of the population is Chinese. Malays contributed to the second highest sports related sudden death which was followed by Indians and others.

Individuals who died suddenly during exercise have advanced heart disease of which they were frequently unaware. The commonest forms of heart diseases associated with sudden death during exercise are coronary artery disease and hypertrophic cardiomyopathy (10, 11). Less common cardiac conditions linked to sports related sudden death include anomalous origin of the coronary arteries, aortic rupture associated with Marfan's syndrome, myocarditis, mitral valve prolapse and various arrhythmias. (10, 11) The incidence of these predisposing diseases in this group of population is extremely low. Detection of some of these conditions in asymptomatic individuals may be difficult, if not impossible. Regular exercise reduces the overall risk of sudden death in those with latent coronary artery disease, yet acutely increases the risk of sudden death during exercise for those with heart disease that predisposes to sudden death.

Most of the sports related deaths occurred due to coronary artery diseases, the number being 22 cases, 50% of the total cases. This was followed by ischemic heart diseases and acute myocardial infarction with 13 and 5 cases respectively. Exercise in general, and regular short-term exercise in particular, produces a significant increase in heart rate, contractility of the heart and increase cardiac output and oxygen consumption. Numerous studies showed that regular exercise has multiple health benefits that go beyond increasing fitness (i.e., improvements in lipid profile, weight loss, reduction of insulin resistance and the risk of type 2 diabetes, cardiovascular disease in general, including the risk of myocardial infarction, heart failure, and death caused by cardiovascular disease. The National Institute of Health recommends a goal of 30 minutes of moderate activity every day of the week (12). However systemic training (dynamic, aerobic) or isometric sports (static, power) has been known to increase cardiac mass and dimensions, and trigger structural remodeling in many people. Although the function of the heart remains preserved, extreme alterations in cardiac dimensions have unavoidably raised concern of whether such exercise-related adaptations are truly physiologic, especially when present for the long periods of time. While firm evidence is presently lacking, one cannot exclude with certainty that such extreme ventricular remodeling due to intense conditioning may have adverse consequences over long time periods (13-17)

However the more important point is that none of these conditions is caused by exercise. Rather, the evidence is clear that regular exercise acts against the development especially of coronary atherosclerosis. There is also no evidence that

exercise accelerates the progression of these other potentially-lethal cardiac conditions.

At present the exact mechanism causing exercise-related sudden death in persons with established disease, especially of the coronary arteries, is not known. Whereas plaque rupture or thrombosis is present in up to 95% of sudden cardiac deaths in the general population, the incidence seems to be lower in exercise-related deaths. Thus exercise-induced ischemia or coronary spasm may be involved in exercise-related deaths (18, 19).

Others cases of sports related sudden deaths in the present study include death while playing squash, snooker, rugby and playing in water theme park. However, these activities did not sum up to significant number and presented as isolated cases, often as exclusive cases. Badminton on the other hand, showed the highest number of deaths for specific type of sport activities. This may be because of the popularity of the game in Malaysia and is also played by all age groups. Besides that, it is a game where one can play near the house and only requires minimal of 2 persons. However, this does not prove in any way that badminton can cause higher risk of sudden death.

From the risk factors perspectives, it was found that the majority of sudden deaths during sport activities belonged to the category of non-smokers. Since the main cause of death seem to be of cardiac causes, it can be concluded that smokers may not have utilized the maximum cardiovascular potential. Smokers are often associated with challenged fitness level. In most instances, smokers have impaired lung functions that may deter them from utilizing those maximum cardiac potentials. This in turn could have led to higher risk of cardiac related deficiencies in the non smokers as they often excel in their cardiovascular capacities.

Another crucial risk factor is obesity. It was observed that obese people did not contribute much to sudden deaths statistics. This might be because they were less likely to get involved in any sporting activity compared with non-obese group.

As for alcoholism, it is difficult to interpret as the term alcoholic is not well defined. From the data, we could only find out whether the subjects had any drinking habits or not. No details on the amount, duration and timing of alcohol consumption could be obtained.

In general, it was observed that there were more deaths occurring above the age of 30 years which may be associated with risk factors they had. The risk factors include obesity, smoking and drinking habit, family history of cardiovascular diseases and the underlying diseases of these subjects.

In our study, we found that white collared workers showed a higher incidence of sudden death during sport activities. This may be due to the unhealthy and sedentary living style where one just has to sit in the air-conditioned room all day long and work. The least number of victims were from self-employed group and students with 5 deaths in each group. As for student, most of them have more free time and always get themselves involved in many activities compared to the older generation. This enables them to be active and decreases the chances of them developing risk factors.

American Heart Association Recommended as before taking up active sports, person should be screened for: - [10]

- Family History: Any premature sudden or cardiac death.
- Personal History :excessive fatigue; shortness of breath; exert ional chest painor discomfort; heart murmur; systemic hypertension.
- Physical examination : heart auscultation ; brachial and femoral pulses.

Therefore, the common concept of "excess of everything is bad" applies here also in avoiding of "intense" physical activity.

Despite the variety of causes of sudden death (SCD), only a few conditions are responsible for most deaths. Population or mass screening is neither economically viable nor practically feasible. More over most sports deaths did not reveal any positive history or identification of causes in many studies. Current data show that we would be doing a woeful job of implementing these standards.[r] Once there is no clue about disease then a small number of obvious and gross cases detectable either on signs and symptoms or ECG can be detected in pre-sports screening. Any athletic participation carries inherent risks and chances of SCD are very remote.

Fatal sport-related injuries can result from head and cervical spine trauma, but most sudden deaths in athletes are cardiac in origin.[7,8] The first recorded sudden death of an athlete was that from Pheidippides , a young long distance messenger , in 400 BC , on arrival in Athens , he reported the defeat of the Persian army and then fell dead.[15]

According to Reisdorff and Prodinge, the conditions linked to cases of Sudden Cardiac Death, there are more than 20 causes.

Conclusion:

Fortunately, the amount of sudden death during sport activities recorded in University Malaya Medial Center from the year 1995 to 2005 is not high and can be considered as a rare event. Despite numerous causes of sudden death, only a few conditions were found to be responsible for most

sports related sudden deaths namely coronary heart disease which contributed as much as 50% of the total causes of death. Most young individuals who are involved with sporting activity who eventually succumb to sudden death have no or minimal history of cardiac problems (family or personal) and no symptoms before death (9). Hence, the detection of at-risk individuals poses a significant challenge to the sports medicine team. Population screening by diagnostic testing is not currently economically or practically feasible, but a significant proportion of at-risk individuals can be identified through a thorough history and physical examination.

Although no perfect screening instrument is currently available, a moral and ethical obligation exists for physicians and athletic trainers to ensure that these group of people are assessed in the most prudent and efficient manner available.

When approached by a patient who wishes either to commence exercise or to establish that it is safe for him or her to continue exercising at their present level, the clinician's first responsibility is to rule out the presence of the acute or chronic diseases associated with sudden death. The clinical problem has several challenges as following (20):

- The incidence of such diseases in the exercising population is low with estimated incidences varying from 1 per 10,000 active exercisers to 1 per 200,000 in children and young adults.
- It is extremely difficult to detect some of these latent forms of heart disease. Indeed, some might have a 30-60% non-critical lesion that does not produce ST segment changes or angina during exercise testing.
- Most acute coronary events occur due to rapid progression of disease at sites at which a critical lesion was not previously present. Furthermore, even when latent disease is detected, it is not always possible to differentiate absolutely those with the disease who will die suddenly during exercise from those with the same condition who are not at risk.

It is clear that there are many people with latent heart disease, especially coronary heart disease, who are able to exercise quite safely without the risk of sudden death. However these are to be distinguished on clinical grounds from those at risk of sudden death during exercise has yet to be established. Accordingly a more pragmatic approach would seem justified. The following guidelines probably represent the current consensus (21, 22):

- All persons over 50 years of age should undergo cardiovascular screening before starting any type of exercise program.
- Younger persons (less than 50 years of age) who are either already participating or who wish

to start exercising should first be interviewed for a family history of conditions associated with sudden death and screened for symptoms and clinical signs of cardiovascular disease, and for risk factors for heart disease.

- When either the family history is suggestive, or clinical suspicion is raised, or risk factors such as hypertension, hypercholesterolemia or cigarette smoking are present, subjects should undergo maximal exercise testing for measurement of exercise performance and the electrocardiographic response to exercise. When abnormalities are detected, further specialist cardiological investigation including echocardiography and possibly coronary angiography is indicated.

Though, it is very difficult to avoid such deaths in absolute manner but, precaution can still reduce these to lowest.

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Torture and the Law: An Indian Perspective

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Abstract

Torture of a fellow human being by another human being is essentially an instrument to impose the will of the 'strong' over the 'weak'. Over the years, the incidence of torture has only increased, with the methods becoming highly complex, involving psychical and/or physical exhaustion. These include deprivation of sleep, food and drink; sometimes combined with forced physical activities or forced standing for hours or even days. Freedom of movement and perception is restricted by confining the person to a very small dark room and his self-esteem is eroded by deprivation of toilet facilities and clothing or by constant verbal abuse. In spite of checks posed by various laws including the International Humanitarian Law, such inhuman practices continue unabated. This article describes the Indian scenario of this world-wide phenomenon, with a view to sensitize the readers about this scourge on the society.

Introduction:

Since time immemorial man has been attempting to subjugate his fellow human beings. Those in power are used to twisting and turning the people through violence and torture, and torture under custody has become a global phenomenon. Men, women and even children are subjected to torture in many of the world's countries,[1] even though in most of these countries, the use of torture is prohibited by law and by the international declarations signed by their respective representatives.

A problem of increasing occurrence and repugnance had been the methods of interrogation and torture perpetrated upon prisoners and detainees. Reference, in this context, is irresistibly drawn to 'modus operandi' exercised by the British Security Forces in suppressing armed insurgency and terrorism carried out by Republican and Loyalist groups in Northern Ireland in 1969. Between 1971-74, allegations of maltreatment and assault by the security forces arose increasingly. Almost during the same period, a few well-publicized cases occurred, exposing the vulnerability of the ordinary public to aggressive tactics of the police and the subsequent inadequacy of the enquiries to address the public issues. The landmark case [2] is that of one, Jim Kelly, aged 53, who was arrested by the police in 'drunk and disorderly' state and was tortured afterwards. During coroner's inquest, police officers admitted sitting on the victim, punching him, squeezing his testicles and throwing him into the back seat of the van, etc. At the police station he was allegedly pulled from the van, banging his head on the floor and dying shortly thereafter. Interestingly, three postmortems were carried out

(including the one at the instance of the family at their own expense) with all the pathologists attributing death to "heart failure". However, the pathologist engaged by the family did conclude that Jim Kelly had suffered more injury than can be reasonably expected in a man who resists arrest; and, that the systemic effects of such injuries, in one way or the other, contributing towards death. A verdict of "misadventure" was brought in after the coroner had emphasized that the pathologists had given the cause of death as "heart failure" and that the Jim Kelly was drunk and had exerted himself. However, with the development of the common law and more radical ideas imbibing human thought and approach, such inhuman practices have progressively been discouraged.

Indian Scenario:

India's refusal to ratify the UN Convention against Torture was primarily based on the contention that its laws were adequate enough to deal with crimes committed by the representatives of the State. Section 330 and 331 of the Indian Penal Code[3] have been enacted to punish those who voluntarily cause hurt or grievous hurt with an object to coerce the sufferer to confess to his guilt or give information respecting the commission of a crime or a misconduct, or to restore property or satisfy any claim or demand respecting thereto. Though the sections are generally worded, the provisions are mostly brought into requisition against police personnel acting in furtherance of obtaining confession through unmoded methods. Indeed, the police personnel in an attempt to win the tributes of superior officers or to avoid censure for slackness to discover the culprit(s) / solve the case get tempted to extort involuntary confession. Another driving force

in this context may be the assumption that the law would not admit in evidence anything said to the police, unless, it is substantially corroborated by the discovery of 'the fact' in consequence of confession / information (Section 27 Indian Evidence Act [4]. The ambit of these sections is wide enough as to extend to all policemen then present, but, who do nothing to prevent torture and either stand unconcerned or withdraw from the scene for fear of getting themselves implicated therein. Such an observation came to be seen in Sham Kants' case,[5] wherein it was held that "the learned trial Judge was quite wrong when he did not hold accused No.1 (ASI) guilty of abetment only on the ground that although he was present, he had not actively participated in beating the suspect."

The official machinery for the protection of human rights in this country was set in motion by the then President's assent to the Protection of Human Rights Act,[6] which came in to force on September 28,1993. Section 3 of the Act provides for the setting up of the National Human Rights Commission (NHRC) and Section 21 for the setting up of the various State Commissions (SHRC). The Act also provides for the designation of certain courts of Session in each state as Human Rights Courts, by the state in consultation with the Chief Justice of its High Court. All these Commissions were given the powers of civil courts vide Section 13(1), with the power to summon any person to give evidence relating to the matter under consideration (Sec. 13(2)), failing which they could be punished under Sections 176 (omission to furnish information)&177 (giving false information) of the IPC. Section 18 provides for "interim relief" (monetary compensation) to the victim, which could be recovered by the State from the accused officials. However, despite such elaborate Acts and Articles in place, along with the requisite machinery, the mindset of the average policeman continues to exist in a medieval time warp and torture by the custodians of the law continues unabated against those very persons, safe-guarding of whose rights and liberty, is their legal duty. This can very much be gathered from the list of police excesses displayed by the NHRC in its web-site.[7] The excesses listed include torture, illegal confinement and false implications and the methods of torture vary from beatings to amputation of the male organ to blinding to gang rape to even death of the victim.

Usual postures adopted by the police to evade responsibility include : (i) showing that the body was found on the road-side or the railway-track so as to pass it off as a case of accidental or suicidal death, or (ii) to make out a case that the arrested person died after he jumped / fell from the building while

trying to escape, or (iii) jumped/ fell out of the running vehicle as he was being transported to some disclosed site / place to effect some recovery, etc.

Exemplifying such like postures through citations will make the things catchier. Nilabati's [8] is an apt case in this series wherein the State's plea that the deceased had escaped from the police custody by chewing off the rope with which he was tied and was then run over by the train, was disbelieved by the Hon'ble Court after appreciation of the evidence in entirety including the postmortem report showing some injuries on the face being of postmortem origin and the report of the Forensic Science Laboratory showing incompatibility of two cut ends of the rope in respect of physical appearance. The next to be cited is the case of death of one Anil Kumar,[9] aged about 21 years, wherein exceptionally intriguing behavior of the police came to be voiced when the police showed Anil's death to be the result of 'suicide' by jumping from the building and converting it into 304-A (causing death by rash or negligent act) in pursuant to demonstrations of the residents and the enquiry report submitted by the SDM. Interestingly, the Hon'ble High Court, while hearing the petition moved by the deceased's mother seeking justice and compensation for her son's death, expressed dissatisfaction over the approach of the police in dealing with the matter and raised queries over observations and conclusions made in the CFSL report especially criticizing the suggestion made in the report that "it seems that the deceased could have attempted crossing the parapet wall to get on to the grid and fallen from a height of about 15 feet to hit the ground on his left." and asked the scientist to explain as to how it found mention in the report, as normally such observation was to be made on specific query from the investigating agency. Compensation to the tune of Rs. 9.95 lakh was directed to the kin of the deceased and it is perhaps, the first time that the State has been asked to pay such a huge amount of compensation to the victim's family. And, finally the case was got registered under section 304 IPC (culpable homicide not amounting to murder).

Apart from the police, there are several other governmental authorities like Directorate of Revenue Intelligence, Directorate of Enforcement, Intelligence agencies like the Intelligence Bureau (IB), Central Bureau of Investigation (CBI), CIA, etc., which have the power to detain a person and to interrogate him. There are instances of torture and death in custody of these authorities as well. For example, the Apex Court took suo moto notice of the death of Sawinder Singh Grover [10] during his custody with the Directorate of Enforcement and after getting an

enquiry conducted by the Additional District Judge, directed the CBI to lodge a FIR and initiate criminal proceedings against all persons named in the report. Directorate of Enforcement was also directed to pay a sum of Rs.2 lakh to the widow of the deceased by way of ex gratia payment at the interim stage.

Our experience derived through the cases conducted at the institute during the preceding ten years shows that deaths in custody may broadly be categorized in two groups, viz: i) death due to or precipitated by medical condition under peculiar circumstances, and (ii) death due to another person's action/behavior including those occasioned from police torture in custody or during restraint or after release from the custody (when death could reasonably be traced to effects of injuries). Majority of cases were due to or somehow related to medical condition and our results stand substantiated by the literature available on the subject. However, the literature often speaks of a third category also wherein death is attributed to deceased's own causal actions i.e. self-harm (deliberate or circumstantially triggered).

In all these cases the inquest proceedings had been conducted by the executive magistrate as contemplated in section 176 of the CrPC.[11] This section is designed to provide a check on the working of the police or to calm any alarm that has been created in the mind of the public in cases of death occurring under some specific circumstances. A recent amendment in the said section requires the inquest proceedings to be conducted by a judicial magistrate. The amendment (effective from 23.06.2006) provides that "in case of death or disappearance of a person or rape of a woman while in the custody of the police, there shall be a mandatory judicial inquiry and in case of death, examination of the dead body shall be conducted within 24 hours of death". It is worth focusing here that in the light of this amendment; the Hon'ble High Court took objection to the inquiry proceedings having been conducted by an SDM rather than by a judicial magistrate in the case of custodial death of Anil Kumar mentioned earlier.[9]

As far as the issue of compensation is concerned, Article 9(5) of the International Covenant on Civil and Political Rights 1966 (ICCPR) provides that "anyone who has been the victim of unlawful arrest or detention shall have enforceable right to compensation". However, India expressed specific reservation to the effect that Indian Legal System did not recognize a right to compensation for victims of unlawful arrest or detention and thus did not become a party to the Covenant. Notwithstanding all this, the Apex Court through judicial activism evolved a right to compensation in cases of established

unconstitutional deprivation of personal liberty or life. The 'Bhagalpur blinding case [12] was the first case where the question of monetary compensation was considered by the Hon'ble Supreme Court. The working principles for calculating the quantum of the compensation was laid down in another case [13] from Bihar. In 1994, the Hon'ble Supreme Court introduced the concept of "personal liability"[14] wherein the State could recover the compensation paid to the victim or his family from the official concerned, as a deterrent to the said officers indulging in the atrocities.

It has been furthered that this compensation was based on strict liability and was recoverable from the State, which shall have the right to be indemnified by the wrongdoer. It was observed that the objective was to apply balm to the wounds and not to punish the transgressor or the offender, as awarding appropriate punishment for the offence (irrespective of the compensation) must be left to the criminal courts in which the offender is prosecuted, which the State was duty-bound to do under the law. Amongst the judgments of other countries cited by the Apex Court in this context, the judgment of the Court of Appeal of New Zealand in Simpson Case [15] deserves mention wherein the issue had been dealt in a very elaborate manner. Each of the five members of the Court of Appeal delivered a separate judgment but there was unanimity of opinion regarding the grant of pecuniary compensation to the victim, for the contravention of his rights guaranteed under the Bill of Rights Act, notwithstanding the absence of an express provision in that behalf.

Conclusion:

The Hon'ble Supreme Court laid down in DK Basu's case [16] the guidelines to be followed in all cases of arrest or detention to combat the evil of custodial crime and bring transparency and accountability therein. However most of the recommendations made by the Hon'ble courts or the various NGOs from time to time are only observed more in the breach and not adhered to. Though most of the rules and instructions regarding the prohibition of torture are incorporated in the curriculum of training of the police force, the basic mind-set has not changed. Hence the need of the hour is to put in serious thinking and concerted efforts by all concerned—the State, the voluntary organizations, the society, etc so as to bring in the needed change in the attitude of the custodians of law.

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Contradictory Skull and Age Estimation

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Abstract

The corpus delicti means the facts of any criminal offence. The main part of the corpus delicti is the establishment of identity of the dead body and infliction of violence in a particular way, at a particular time and place, by the person on persons charged with the crime and none other. The case against the accused cannot be established unless there is convincing proof of these points. If the victim's identity is not known, it becomes difficult for the police to solve the crime. Determination of the age of the individual comes in routine forensic practice, as the age of the victim is one of the three primary characteristics of identification. But in few cases it is not easy to opine about the age of the victim especially when we are receiving only a single bone like skull with contradictory findings. The presented case report is an attempt to discuss that how we can solve such problems by considering the other criteria's for age estimation in skull which can be of a great use when some contradictory findings are there in remains of skeleton.

Key words: Skeletal remains, Age, and Identification.

Introduction:

Forensic identifications by their nature are multidisciplinary team efforts relying on positive identification methodologies as well as presumptive or exclusionary methodologies. Typically, this effort involves the cooperation and coordination of law enforcement officials, forensic experts, serologists and other specialists as deemed necessary. In each discipline, there is the need to develop scientific evidence relative to the questions of fact regarding identification in a defensible manner grounded on general rules of acceptance, reliability and relevance. In the forensic medicine, a great deal of effort is spent on the identity or confirmation of identity of the victim and perpetrator. This labor intensive aspect of a medicolegal examination focuses on the expertness to decide whether the remains are human or animal, and once it is decided that the remains are human in origin then we can proceed further to estimate the other data like age, sex and stature which contribute in identification. The experienced forensic pathologist considers a range of the available features and techniques before reaching a conclusion as multiple indicators are having the key role.

Case history:

In July 2007, a young male of 16 years age was kidnapped by his friends for the purpose of ransom

and to hide their identification the kidnappers killed him and disposed off the body in a jungle. Police detained the suspects and during interrogation they accepted the crime committed. The skull and few pieces of long bones of the victim were recovered from the scene of crime as told by the accuse party and were brought to us for the postmortem examination. After examination we found that the bones were human in origin, belonged to one and the same individual and skull was showing male characteristic features. When we examined the skull to determine the age we got surprised to see that the third molars were not erupted in upper jaw bilaterally, while the skull sutures were completely fused on outer as well as on inner tables. The dental examination was showing that the skull is of a young adult of age between 12-17 years, while the fused skull sutures were indicating its older age. The suspicion was corrected by considering the other criteria of skull for age determination and finally we reached on a conclusion that the skull belongs to an individual of age between 12-17 years, which was also corresponding with the victim's age as identified later. The criteria which were suggesting the younger age of the skull are as following:

1. The contour of the skull was smooth and invorine on both inner and outer surfaces.

2. Muscular markings were less prominent especially on the temporal and nuchal lines and on masseteric attachments site.
3. The grinding effect was very less on the available teeth.
4. There was no groove of middle meningeal arteries on both side of skull as seen in old age.
5. The pactionion depressions were also not present on both sides of sagittal sutures as seen in old age.

Finally the skull was preserved for superimposition technique and teeth were preserved for DNA-fingerprinting to confirm the identity. On the basis of result of DNA-fingerprinting and cross matching with father and mother's blood, identity of the victim was confirmed. After going through all the reports we found that the age of the victim was corresponding very well with the age given by us.

Discussion:

Age is one of the three primary characteristics for the purpose of identification. Determination of the age of individual is not a difficult task in unknown dead bodies even when the body has converted into the skeleton. Dental criteria and ossification centers of long bones are better for age estimation when the individual belongs to the younger age group of less than 20 years. But when the age of the individual is more than 20 years the age estimation becomes difficult by examination of other criteria like changes

in pubic symphysis and fusion of skull sutures etc., as these are not reliable criteria's for age determination. And it becomes more complicated when we are receiving only a single bone like skull, which is showing the contradictory findings as in present case. In such cases we should take into the consideration of other criteria's to determine the correct age of the individual so it can be helpful to the investigative agencies in establishment of corpus delicti.

The skeletal remains are rich in information. The forensic experts, working as a part of team of investigative agencies, serologists and other forensic scientists, can greatly add to the research and the analysis consequently reaching the truth. Indeed, the results of the various experts working as a team and discussing the case at all stages of the investigation comes as a tremendous helping hand as to what each expert does individually.

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A Study of Burn Deaths in Imphal

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Abstract

This is an epidemiological profile of the burn fatalities brought to the morgue of RIMS Imphal over a 16 yr period from 1990-2006. The study explores the year-wise incidence, age-gender distribution, time of occurrence, place of occurrence, socio-economic status, survival period, place of death, cause of death, body surface area involved, caste distribution, manner of death and monthly distribution. From the observations and analysis, certain etiologies are elicited and their preventive measures are suggested.

Key Words: Burn, death, cause of death.

Introduction:

Homicidal burning of married women in India is a major concern for the Government, law-enforcing authorities, the judiciary, the police and medicolegal experts all over the country who are associated with dowry disputes. Dowry death, a heinous crime is gradually engulfing and polluting the entire society. [1] Manipuri society is traditionally not dowry oriented society but sporadic incidence occurs now and then. To know the trend of the changing profile this study has been taken up.

Material and Method:

A retrospective study of all the burn cases that were brought to the morgue of RIMS Imphal during the period 1990-2006 was done. Altogether, 65 cases were studied. The age and sex of the deceased, the venue and time of sustaining burn injuries, socio-economic status of the victims, body surface area involved, survival period and cause of death, circumstances of burns, etc. were ascertained from the autopsy records. The findings are tabulated in various tables to analyze the whole picture.

Observations:

During the period a total of 6715 medicolegal autopsies were conducted by the Dept. of Forensic Medicine, RIMS, Imphal, out of which 65 were deaths due to burns. There is no regular pattern in the incidence of burns over the study period. The annual incidence was 0.96 and the highest was seen in 1998. But, a slightly increased incidence is observed in the later half of the study period. (Table-1) Regarding the gender distribution slight male preponderance was observed, 50.76 and 49.23 in males and females respectively. (Table-2) The age group most involved was 21-30yrs with an incidence of 38.46%, which was more in females. In the extremes of age i.e., less than 10 yrs, there were 2 cases but there was no case above 60 yrs. (Table-2) On the whole, 53.84% sustained burn injuries during daytime. (Table-3) Taking the place of occurrence into consideration, 24.61% occurred in the

husband's house which was the maximum among the studied categories. (Table-4) Most of the victims i.e., 53.84% belonged to lower socio-economic strata. (Table-5) Maximum percentage of victims survived for less than 1 hr and 21.53% for more than one week. (Table-6) 50.76% died in the hospital whereas 49.23% at the site of occurrence. (Table-7) The cause of death was burn shock in 67.69% cases. 49.23% died within an hour of sustaining the burns, 21.53% cases survived for more than 1 week. (Table-8)

Taking the body surface area involved into consideration it was observed that in about 73.84%, >80% body surface area was involved (Table-9). However, in 4 cases there death was due to smoke suffocation.

In Manipur, Meiteis constitute the majority of the population. But, 53.84% of the cases belonged to Non-Manipuris, mostly Bengalis and Biharis in whose custom dowry is very common. This is followed by Meiteis, Muslims and Tribals. (Table-10) Most of the cases were accidental, 35.38%, followed by homicidal, 29.23% and suicidal, 24.61%. There was also a case of self immolation as a protest against the Armed Forces Special Powers Act. (Table-11) Highest incidence, 32.30%, was seen in January. (Table-12)

Discussion:

Dowry death is not traditionally prevalent in Imphal (capital of Manipur). However, sporadic instances of burn deaths of newlywed Non-Manipuri women suggest the possibility of a sinister trend slowly creeping into an erstwhile placid society.

Slight male preponderance was observed, 50.76 and 49.23 in males and females respectively. This may be because males are generally more active and involved in activities of all kinds. But the difference is not much. Females are not far behind and mainly comprised of non-manipuris.

53.84% of the cases belonged to Non-Manipuris, mostly Bengalis and Biharis in whose custom dowry is very common.

The age group most involved was 21-30 yrs with an incidence of 38.46%, which was more in females. Taking the place of occurrence into consideration 24.61% occurred in the husband's house. These observations are in conformity with other studies from the various regions of India [2-10] and in contrast to the studies from other developing and the developed countries. [11-16]

53.84% sustained burn injuries during daytime. This may be due to the fact that people are usually occupied in their work during daytime and therefore the burns are sustained in the course of their activities.

Maximum percentage of victims survived for less than one hr and 21.53% for more than one week because majority sustained more than 80% burns.

Most cases were accidental followed by homicidal and suicidal burns. This is in agreement with Sharma BR et al. [17] among the suicidal cases, majority were Non-Manipuri (Bengali and Bihari) women in the age group of 21-30 yrs.

Among those who die in suspicious circumstances, family quarrels and marital disharmony are the two important predisposing factors. Illiteracy, arranged marriage, joint family structure, unemployment, economic dependence of the husband on the parents, complete dependence of the women on their husband and in-laws and lack of social security were other contributory factors affecting the incidence in some way. [17-20] This is supported by the observation that 53.84% of the victims in our study belonged to low socio-economic stratum and also that 24.61% occurred in the husband's house which was the maximum among the studied categories. Most of the cases occurred in January. This may be due to use of fire for warming during winter.

Table-1: showing year-wise incidence

Year	No. of cases	%	Total no. of PM	%
1990	2	3	262	0.76
1991	1	1.5	414	0.24
1992	0	0	286	0
1993	5	7.6	363	1.37
1994	0	0	391	0
1995	3	4.6	412	0.72
1996	1	1.5	363	0.27
1997	4	6.15	448	0.89

1998	13	20	413	3.14
1999	7	10.7	399	1.75
2000	1	1.5	499	0.20
2001	5	7.6	459	1.08
2002	4	6.15	433	0.92
2003	5	7.6	403	1.24
2004	6	9.2	381	1.57
2005	7	10.7	448	1.56
2006	1	1.5	410	0.24
Total	65	100	6715	0.96

Table-2: age-gender distribution

Age in Years	Male (%)	Female (%)	Total (%)
<10	2 (6.06)	3 (9.37)	5 (7.69)
11-20	5 (15.15)	9 (28.12)	14 (21.53)
21-30	9 (27.27)	16 (50)	25 (38.46)
31-40	12 (36.36)	3 (9.37)	15 (23.07)
41-50	2 (6.06)	1 (3.12)	3 (4.61)
51-60	3 (9.09)	0 (0)	3 (4.61)
>60	0 (0)	0 (0)	0 (0)
Total	33 (50.76)	32 (49.23)	65 (100)

Table-3: time of occurrence

	Day	%	night	%	total
No. of cases	35	53.84	30	46.15	65

Table-4: Place of occurrence

place	Male (%)	Female (%)	Total (%)
quarter	4 (12.12)	4 (12.5)	8 (12.30)
Own/rented house	5 (15.15)	8 (25)	13 (20)
Husband's house	0 (0)	17 (53.12)	17 (26.15)
Shop	2 (6.06)	1 (3.12)	3 (4.61)
Work place(hotel)	2 (6.06)	0 (0)	2 (3.07)
Paddy field	1 (3.03)	0 (0)	1 (1.53)

Roadside	13 (39.39)	0 (0)	13 (20)
Master's house	0 (0)	1 (3.12)	1 (1.53)
Bazaar	3 (9.09)	0 (0)	3 (4.61)
Misc.(Riot)	2 (6.06)	2 (6.25)	4 (6.15)
total	33 (50.76)	32 (49.23)	65 (100)

Table-5: socio-economic status

socio-economic status	Male (%)	Female (%)	Total (%)
High	1 (3.03)	3 (9.37)	4 (6.15)
Middle	19 (57.57)	7 (21.87)	26 (40)
Low	13 (39.39)	22 (68.75)	35 (53.84)
total	33 (50.76)	32 (49.23)	65 (100)

Table 6: survival period

Period	No. of cases	%
<1 hr	32	49.23
1-24 hrs	11	16.92
24-48 hrs	2	0.30
2-3 days	1	1.53
3-7 days	5	7.69
>1 week	14	21.53
total	65	100

Table 7: place of death

place	No. of cases.	%
hospital	33	50.76
Burn site	32	49.23
total	65	100

Table 8: cause of death

Cause of death	No. of cases.	%
Burn shock	44	67.69
Toxaemia	9	13.84
Septicaemic shock	4	6.15
Acute tubular necrosis	1	1.53
Complications	2	3.07
Smoke suffocation	4	6.15
total	65	100

Table 9: body surface area involved

Area	No. of cases	%
0%(only smoke suffocation)	4	6.15
<30%	0	0
31-40%	0	0
41-50%	0	0
51-60%	5	7.69
61-70%	2	3.07
71-80%	6	9.23
>80%	48	73.84
Total	65	100

Table 10: Caste distribution

Caste	No. of cases	%
Meitei	24	36.92
Tribal	2	3.07
Non-Manipuri(Bengali, Bihari)	35	53.84
Muslim	4	6.15
Total	65	100

Table 11: manner of death

Manner	No. of cases	%
Suicidal	16	24.61
Homicidal	19	29.23
Accidental	23	35.38
Riot	5	7.69
Self-immolation(AFSPA)	1	1.53
Unknown	1	1.53
Total	65	100

Table-12: monthly distribution

month	No. of cases	%
Jan	21	32.30
Feb	3	4.61
Mar	4	6.15
April	1	1.53
May	8	12.30
June	3	4.61
July	6	9.23

Aug	4	6.15
Sept	3	4.61
Oct	4	6.15
Nov	5	7.69
Dec	7	10.76
Total	65	100

Conclusion:

Burn injuries have been a major cause of concern since prehistoric days to the present era of modern medicine. However, the general belief that burns usually occur at the two extremes of age, indicating the accidental nature of infliction does not hold true in the present Indian setup where the majority of reported cases belongs to second or third decade of life. However, the female preponderance in the 10-20, 21-30 yrs age groups and the maximum incidence in Non-Manipuris should be a strong reason to start thinking of the sneaking intrusion of dowry harassment in a traditionally non-dowry oriented society.

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Foreign objects in genitalia: Homicide with destruction of identity – A case report

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Abstract

Sadistic homicides are probably more common than would be expected from reading the literature, where only a few cases are mentioned. In the present case an unclothed dead body of 25 year old female was found in the forest area by the police. On postmortem examination, we found crushed head by heavy hard blunt force (a heavy stone with blood stains recovered near body). After killing her, assailants tried to destroy her identity by burning the face and disfiguring the head. In this case beside common findings of homicide as usually seen in sexual murder cases; there was unique finding of a wine bottle introduced into vagina probably out of frustration. Body also had postmortem abrasions over different parts of the body. Postmortem fractures of multiple ribs were present on both sides of the chest. The death was due to crushed injuries to head caused by hard blunt force, which was sufficient to cause death in ordinary course of nature. We also discuss the possible scenario of psycho-pathology of accused in such cases.

Case history:

A body of an adult female of about 25 year old was found dead in a naked condition in a reserved forest area in South Delhi in June, 2006 by police. There was information to Police via public call as 2-3 people had killed one lady after doing sex and run away. Further enquiry, revealed that they all had consumed alcohol along with the lady. They also had sexual intercourse with her using condom. After sometime she started abusing using foul language probably over money or dissatisfaction. Following the quarrel they killed her by hitting her head with a heavy stone. After killing her, they also tried to destroy her identity by burning her face with wooden stick and twigs and her cloths. One of them also introduced a wine bottle inside vagina. There were multiple postmortem injuries in particular pattern over left side lower part of chest, abdomen and inguinal regions including upper part of left thigh. All accused were subsequently arrested by the police.

Observation:

We conducted a complete medico-legal autopsy and noted following findings and injuries over the body – Rigor mortis was passed off. Post-mortem staining was present and fixed over the back of the body except pressure contact areas. No sign of moderate or advance decomposition seen. Left eye partially opened and right eye crushed. Face was distorted due to multiple crush injuries.

Important Ante mortem injuries:

1. Crushed injuries with multiple depressed comminuted fractures of skull bones of both parietal, temporal and frontal bones and facial

bones and associated lacerations over right forehead and face. Left side temporal region had crushed injuries of ear and with multiple fractured bone pieces and brain matter coming out. Brain matter was also coming out from right frontal and temporal region. Laceration of size 5x1 cm and cavity deep also seen over the nose and associated with nasal bone fracture. Exploration showed extravasations of blood under the scalp all over the skull. Meninges tears were present at multiple places. Brain matter lacerated and pulped out in pieces. (Figure 1,2, and 3)

2. Abrasion of size 8x2 cm was present over anteromedial surface of left thigh placed horizontally and 16cm above to left knee with reddish discoloration.
3. Multiple abrasions of varying size 0.2-2 cm x 0.2-1 cm were present over anterolateral surface of right thigh.
4. Contusion of size 3 x 2 cm was present over upper part of anterior aspect of right knee with reddish discoloration.

Postmortem injuries:

Postmortem burn injuries seen over upper half of chest above the level of nipples including neck and left side of face with partial singeing of scalp hair. Heat haematoma seen over the upper part of the sternum (Figure 3).

Multiple abrasions of varying size around the umbilicus, over lower portion of chest on the left, the upper arm and lower arm, upper arm, left hypochondrium region, the upper and lower arm of abrasion, upper arm of abrasion, left thigh, left inguinal region as shown in diagram (Figure 4)

Anal examination did not reveal any important finding. Vagina was roomy and fresh reddened areas. It did not show presence of semen.

Death in this case was caused by crushed head and face produced by hard blunt force and which was sufficient to cause death in the ordinary course of nature. However, viscera have been preserved for chemical analysis to rule out / substantiate any intoxication.

Discussion:

Postmortem mutilation of a victim's body by perpetrator is not an uncommon finding. The majority of such cases involve dismemberment for the purpose of disposing or hiding a body or of preventing identification. It also makes estimation of the cause of death very difficult. During the 30 year period 1961-1990, a total of 22 deaths with criminal mutilation / dismemberment of human body were registered in Sweden by Rajs et al.[2] They described mutilation in three categories as defensive, offensive (lust murder) and necromanic mutilation. The perpetrators of the defensive and aggressive mutilation were mostly disorganized i.e. alcoholics, or drug abuse and mental disorders and criminal histories while lust murderers were mostly organized with a history of violent crimes.

The characteristics of the mutilations were diverse. In cases of murder committed in association with sexual deviation, wounding is usually limited to the breasts and sexual organs. Corpse mutilation can also be of a symbolic nature as in cases of mafia murders (revenge punishment) and then it is associated with torturing the victim and with the motive of destruction of identity of victim.

Kunz J, Gross A [1] described a case of unusual postmortem mutilation of a victim's body, after killing his father, the son decapitated his body. The motive of the murder was revenge and the postmortem mutilation was the realization of the perpetrator's fantasies, symbolically representing a penalty for the reprehensible past life of his father.

Srgh M [3] elucidated murders of two young women the bodies were devastated in a peculiar way and some organs were removed.

In our case the head, face, portion of chest were the most common part of the body, which were burnt / destroyed / mutilated. There may be various reasons;

1. To prevent identification of the victims;
2. To make it difficult to determine the cause of death;
3. As an act of depersonalization, which is often seen when the murder is disorganized and has a close relation to his victim or offensive mutilation as a general act of frustration.

In this case introduction of foreign object to genitalia could be an outcome for

1. Frustration of non-performing partner due to heavy intoxication or otherwise
2. Extortion demand by victim
3. Blackmailing
4. Psycho-pathic tendency of accused for obtaining sadistic pleasure.

In this case as there was alleged history of consensual sexual activity which could be or could not be as body had injuries so it could be non-consensual activity also. Apparently there was no smell in the GIT contents but samples were sent for alcohol screening / concentration estimation. In literature, various materials and objects like chilly powder, corrosives, metal or wooden sticks are introduced into genitalia as a part of punishment for being unfaithfulness or infidelity. Males suffering from depression due to erectile dysfunctions, premature ejaculation and impotency may indulge in extreme frustration cases. In this psychological profiling of the accused can also be helpful in knowing for such abnormal instincts. At times, provocative words by female partner about their male hood could trigger such impulsive murder and mutilation.



Figure 1. Female victim with crushed head and foreign object (Wine bottle) in genitalia



Figure 2. Female victim with remnants of burnt material and burnt small twigs in head area.



Figure 3. Disfigured head and face with protruding brain substance and Post-mortem burns visible over face, neck and chest areas.



Figure 4 . Naked female body with foreign object in genitalia

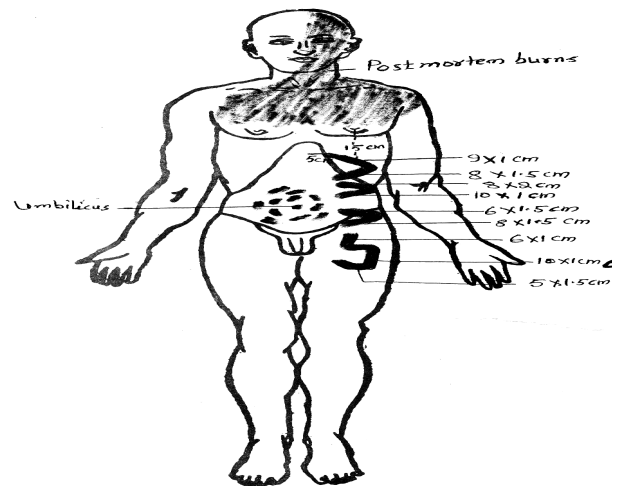


Figure 5. Postmortem burns and abrasions with artifact abrasions (Ant bites) over the

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Statistics: Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Avoid relying solely on statistical hypothesis testing, such as the use of P values, which fails to convey important information about effect size. Define statistical terms, abbreviations, and most symbols. Specify the computer software used.

Results:

Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. When data are summarized in the Results section, give numeric results not only as derivatives (for example, percentages) but also as the absolute numbers from which the derivatives were calculated, and specify the statistical methods used to analyze them. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables. Avoid nontechnical uses of technical terms in statistics, such as "random", "normal," "significant," "correlations," and ".sample."

Discussion:

Emphasize the new and important aspects of the study and the conclusions that follow from them. Do not repeat in detail data or other material given in the Introduction or the Results section. For experimental studies it is useful to begin the discussion by summarizing briefly the main findings, then explore possible mechanisms or explanations for these findings, compare and contrast the results with other relevant studies, state the limitations of the study, and explore the implications of the findings for future research and for clinical practice. Link the conclusions with the goals of the study but avoid unqualified statements and conclusions not adequately supported by the data. In particular, authors should avoid making statements on economic benefits and costs unless their manuscript includes the appropriate economic data and analyses. Avoid claiming priority and alluding to work that has not been completed. State new hypotheses when warranted, but clearly label them as such.

References:

References to review articles can be an efficient way of guiding readers to a body of literature; review articles do not always reflect original work accurately. Small numbers of references to key original papers will often serve as well as more exhaustive lists. Avoid using abstracts as references. For the reference style and format the uniform requirements of the International Committee of Medical Journal Editors are used. Should be numbered singly in the order in which they are cited (using numerical in square brackets in the text and listed in numerical sequence on a separate sheet. Reference to journals, book and multi author volumes should accord with following examples.

1. Sivaloganathan S and Butt WP. A foot in the Yard. Med. Sci. Law, 1988; 28: 150-155.

2. Mukherji JB. Forensic Medicine and Toxicology. 1 st Ed. Calcutta: Academic Publishers; 1981. p.72.

Personal Communications, Unpublished Papers etc. are not allowed as references.

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Tables capture information concisely, and display it efficiently; they also provide information at any desired level of detail and precision. Including data in tables rather than text frequently makes it possible to reduce the length of the text. Type or print each table with double spacing on a separate sheet of paper. Number tables consecutively in the order of their first citation in the text and supply a brief title for each. Do not use internal horizontal or vertical lines. Authors should place explanatory matter in footnotes, not in the heading. Identify statistical measures of variations, such as standard deviation and standard error of the mean. Be sure that each table is cited in the text.

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Figures should be either professionally drawn and photographed, or submitted as photographic quality prints. In addition electronic files of figures in a format (e.g., JPEG or GIF) will produce high quality images. For x-ray films, scans, and other diagnostic images, as well as pictures of pathology specimens or photomicrographs, send sharp, glossy, black-and-white or color photographic prints, usually 127 x 173 mm (5 x 7 inches). Letters, numbers, and symbols on Figures should therefore be clear and even throughout, and of sufficient size that when reduced for publication each item will still be legible. Titles and detailed explanations belong in the legends, however, not on the illustrations themselves. Photomicrographs should have internal scale markers. Symbols, arrows, or letters used in photomicrographs should contrast with the background. If photographs of people are used, either the subjects must not be identifiable or whenever possible permission for publication should be obtained. Figures should be numbered consecutively according to the order in which they have been first cited in the text. Type or printout legends for illustrations using double spacing, starting on a separate page, with Arabic numerals corresponding to the illustrations. When symbols, arrows, numbers, or letters are used to identify parts of the illustrations,

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Abbreviations and Symbols: Use only standard abbreviations; the use of non-standard abbreviations can be extremely confusing to readers. Avoid abbreviations in the title. The full term for which an abbreviation stands should precede its first use in the text unless it is a standard unit of measurement.

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