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Patiala.

Editor-in-Chief : Prof. R.K. Gorea

From Editor's Desk

It is my great pleasure in bringing to you the second number of the current year. I hope it will be of your liking. I expect your cooperation and critical evaluation. I thank Mr. Charanjit Walia of Mata Sahib Sahib Kaur Institute of Nursing, Mohali; alongwith Dr. Harinder Singh and Dr. D.S. Bhullar for their liberal help in publishing this journal. I see a lot of blood shed in the world due to weapons. This time I will like to share my views on the medical and social aspects of proliferation of small arms and light weapons in South Asia. These arms are posing a big hazard to our continent particularly South Asia. I expect that after reading the editorial you will do everything possible within your reach to check the menace of small arms and light weapons. I convey my thanks to all the members of Indian Academy of Forensic Medicine who are sending me the articles regularly without which this journal is not possible. I convey my sincere thanks to all my departmental colleagues who are rendering me immense help in this noble project.

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Editorial

MEDICAL AND SOCIAL ASPECTS OF PROLIFERATION OF SMALL ARMS AND LIGHT WEAPONS IN SOUTH ASIA

Proliferation of small arms is becoming a worldwide nuisance and it has become a problem particularly for the south Asia where conflicts are present in almost all the countries. Conflicts are within the countries and in some cases with each other and problem of terrorism is adding fuel to the fire. In our neighborhood involving Afghanistan, Pakistan, India, Nepal, Bhutan, Maldives, Sri Lanka and Bangladesh this problem is raising its head in a very ugly manner. Small arms are Pistols, Revolvers, Hunting rifles, Machine guns and Light weapons that can be carried by one or two people mounted on a vehicle or carried by pack animal like Shoulder fired rocket Launchers and Mortars (of Caliber less than 100 mm). This is a very big problem and magnitude of this problem can be gauzed from the following facts that as per the small arms survey: 2003 there are 639 Millions small arms and light weapons in circulation which are more than one for every 10 people on this planet. This has a severe impact on human development, including death and injury, the collapse of basic services, declines in economic activity. More than four million small arms have been eliminated from global stockpile in the last decade due to weapons collection programs.

8 millions such arms are manufactured each year. 13 countries dominate this trade amongst these USA, Russia and China dominates. It is a trade of US $ 4 – 5 Billions. 80% of such weapons are purchased by civilians. 59.2% of such weapons are owned privately, 37.8% owned by government armed forces, 2.8% owned by Police and 0.2 % owned by insurgents.

If we compare this problem with USA there are 220 – 230 millions weapons which cause 2800 deaths every year with highest rate of suicides, homicides and accidents and it is a leading cause of death in age group 15 -24 years and third leading cause of death in under 15 year age group.

If we see the magnitude of problem in UN after imagining United Nation as a country then we will see that there are 17 – 25 deaths / 100,000 due to this problem, 100 relief workers die every year, 280 relief workers injured every year and 2 millions small arms destroyed every year. During the period of 1991-2000 in 46 out of 49 conflicts these were weapons of choice causing 300,000 deaths out of which 90% were civilians and 80% killed were women and children. When children are exposed to guns it instill a belief that weapons are essential instruments for protection and survival and ultimately this will lead to gun dependency, gun glorification and culture of violence, fear & hopelessness.

Magnitude of problem in India is by no means a small one. In past 10 years there have been 75,000 deaths by such weapons and 4500 illicit arms have been seized. Most of the country made arms are made in U.P. and Bihar and foreign made weapons are smuggled through Bombay via air and sea routes. There are 5 millions such arms with terrorists, insurgents and criminals (About 1% of total weapons). 25% trade is illegal (one and a half billion US $). Prime Minister India Gandhi was killed by small arms, terrorism shattered Punjab, there is burning problem in north east India, Kashmir is Bleeding, People War Group and other smaller groups are causing havoc in India with these weapons.

Sri Lanka is facing its own problems. LTTE (Tamil) had ethnic tensions with the majority Sinhalese population with huge causalities on both sides. Small arms & light weapons are mainly used by them.

Magnitude of problem in Nepal is though not big but cannot be ignored. There is Constitutional Monarchy and multi party democracy in this country. King Birendra and members of the Royal family of Nepal were killed. There is Maoist Group insurgency activities resulting in killing many civilians.

Bangladesh got separated from Pakistan in 1971. Its First Prime Minister Sheikh Mujibur Rehman was killed and there are Human rights violations on some ethnic groups, women and children.

In Bhutan there is hereditary monarchy and it got independent in 1950.it is facing problem of refugees emigrating to Nepal but still it has US $ 1467 per capita GDP.

Afghanistan was invaded in 1979 by Soviets union and which were displaced by mujahiddin (lot of arms from Pakistan and indirectly from USA). In 1996 Taliban got control backed by Pakistan. Hamid Karzai came to power by Bonn Process but there is Inter group rivalry. There is high rate of illiteracy and poverty in this country.

Maldives were under British rule and it got Independent since 1965. It is peaceful with US $ 2082 per capita GDP. In South Asia there are a lot of casualities by these weapons.

It is a huge burden on the governments to treat all those injured. Treating such victims takes away the vital funds from health departments needed for curing other diseases. It leaves behind a trail of disabled persons needing extra medical attention. There are personal costs of treatment and rehabilitation along with psychological and psychosocial costs. There are increasing attacks on health workers resulting in closure of health institutes. Due to this Vaccination and immunization coverage falls, life expectancy decreases and child mortality rate increases.

There are 1.33 billion populations in the south Asia with US $ 430 per capita income and only US $ 220 per capita in Nepal with a lot of drugs and illicit arms trade. This creates fear among the populations. This creates hatred among various population groups. It is a burden on the economy of democracies due to which development of a countries lag behind. Funds have to be diverted to pay compensation to victims and fight such groups with arms. It causes destruction of physical infrastructure, decrease of agriculture production and school enrollment... Foreign and domestic investment decreases resulting in loss of domestic revenue. 44% of world poor are in South Asia.522 million people earn less than US $ 1/day. SAARC was formed to take care of social aspects.

Mr. Arun Shourie had rightly said that we should act with the urgency of a man, where his hair are on fire. Some of the solutions coming to my mind are that there should be control over manufacturing and marketing with a procedure and documentation for export, transit and brokering. Stockpiling should be prevented and comprehensive tracing system should be there with detailed record keeping, willingness to inform others and due care & sense of responsibility while transferring weapons should be exercised. There should be no transfer to non state actors and unauthorized entities. There should be destruction of weapons where conflicts have ended so that arms are not passed on to terrorists somewhere else in the world by illicit trade. There should be prevention of conflicts and post confliction rehabilitations. We know the problem, we know what is to be done, and we have technology for this in our reach. We should exchange information; we should have international understanding, cooperation and legally binding's instruments. Small arms and light weapons need as much attention as weapons of mass destruction. These are not just the weapons, which need attention but also the ammunition as without ammunition these weapons are of no use. The question arises- who is going to do this? Who will bell the cat? Can we depend on our politicians? Is it not the duty of the police or the army to do this? If we do not want to solve the problem we should definitely raise questions like this! If we want to solve the problem all of us will have to work, work honestly and work with the zeal of man who does not have the word impossible in his dictionary. We will have to emphasize in the field where we are working and bring it to the knowledge of all our colleagues that what dangers these weapons are to our society and to our little world. We will have to change the opinion of the public about such important issues. Only the public will elect such honest and dedicated leaders who will think more about them rather than the arms manufacturers and arms dealers. In this way lot of money will be saved which can be utilized for the up-lifting of the society. Have the will power to resolve the issue, sacrificing monetary gains and we will have a much better world to live in.

Prof. R.K.Gorea

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SEX DETERMINATION IN NORTH INDIANS USING MANDIBULAR CANINE INDEX

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ABSTRACT

Teeth are an excellent material in living and non-living populations for anthropological, genetic, odontologic and forensic investigations. Amongst all teeth, the mandibular canines are found to exhibit greatest sexual dimorphism. Rao et al (1989) used the mandibular canine index for sex determination and found it to give satisfactory results. Muller et al (2001) concluded that Rao et al's method can only be used in case of correct lower anterior dental alignment and by using the standard mandibular canine index of the local population. The present study endeavors to establish the effectiveness of mandibular canine index in predicting sex in North Indian population taking correct dental alignment into consideration.

It was seen that with the standard mandibular canine index, it was possible to detect sex in North Indian population to an extent as high as 75%. This study establishes the existence of a statistically significant sexual dimorphism in the morphometry of mandibular canines in North Indian population.

KEY WORDS: Odontology, Occlusion, Canine, Mandibular canine index, Sexual dimorphism

INTRODUCTION

Teeth are an excellent material in living and non-living populations for anthropological, genetic, odontologic and forensic investigations. Their durability in the face of fire and bacterial decomposition makes them invaluable for identification [1]. The mandibular canines have a mean age of eruption of 10.87 years and are less affected than other teeth by periodontal diseases. These are the last teeth to be extracted with respect to age. Canines are also better likely to survive severe trauma such as air disasters, hurricanes or conflagration. These findings indicate that mandibular canines can be considered as the 'key teeth' for personal identification. [2].

Tooth size standards based on odontometric investigations can be used in age and sex determination [3]. Whenever it is possible to predict the sex, identification is simplified because then only missing persons of one sex need to be considered. In this sense identification of sex takes precedence over age [4]. This identification of gender using odontometric techniques is of real interest in case of major catastrophes when bodies are often damaged beyond recognition.

One of these methods given by Rao et al [5] is known for its simplicity and speed and gives satisfying results. However Muller et al [6] concluded that this method can only be used in case of correct lower anterior dental alignment and by using the standard Mandibular Canine Index of the local population. No such study has been carried out in North Indian subjects. The present study endeavors to establish the effectiveness of Mandibular Canine Index in predicting sex in North Indian population taking correct dental alignment into consideration. This is of definite significance as tooth morphology is known to be influenced by cultural, environmental and racial factors [7].

MATERIAL AND METHODS

Selection criteria: Sixty subjects, 30 males and 30 females in the age group of 17-21 years were selected for the study. This age group was selected, as attrition is minimal in this age group [8]. The study was conducted on the students of Government Medical College, Patiala. The inclusion criteria were as follows:

1. Healthy state of gingival and periodontium.

2. Caries free teeth.
3. Normal overjet and overbite.
4. Absence of spacing in the anterior teeth.
5. Normal molar and canine relationship.

The width of the mandibular canines was taken as the greatest mesio-distal width between the contact points of the teeth on either side of the jaw (Fig.1). The inter-canine distance was measured between the tips of both canines in the lower jaw (Fig.2). Intra-oral measurements were taken in 60 subjects, (30 males and 30 females) in the age group of 17-21 years. All measurements were taken on an anatomically sound basis using a Vernier Caliper with a resolution of 0.02 milli-meters and a divider with a fixing device.

The readings obtained were subjected to statistical analysis to derive conclusions and Sexual Dimorphism in right and left mandibular canines was calculated using formula given by Garn et al (1967) as follows.

SEXUAL DIMORPHISM =

Where X_m = Mean value of males

X_f = Mean value for females

Further the mandibular canine index was calculated based on the formula used by Rao et al [5].

MANDIBULAR CANINE INDEX (MCI)

$$= \frac{\text{Mesio - distal crown width of mandibular canine}}{\text{Mandibular canine arch width or inter - canine distance}}$$

The readings obtained were subjected to statistical analysis to derive conclusions.

STANDARD MANDIBULAR CANINE INDEX

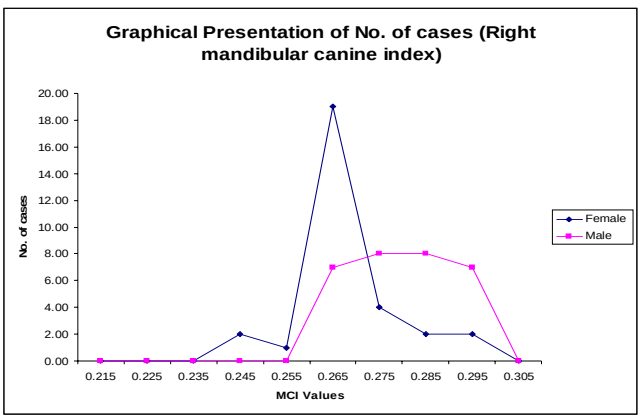
The standard Mandibular Canine Index of the population studied was obtained from the measurements taken in the sample by applying the following formula Std. MCI =

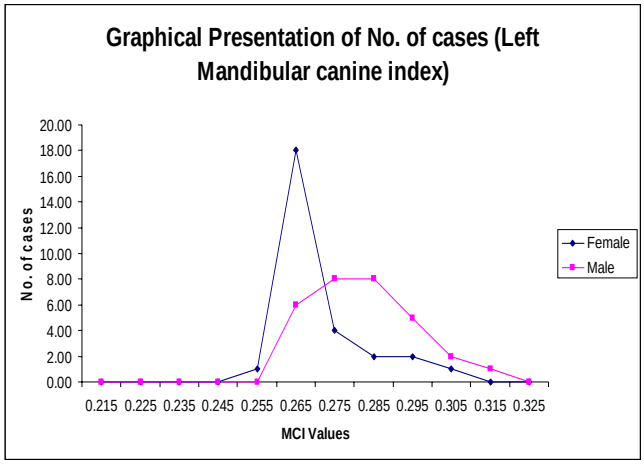
$$= \frac{(\text{Mean male MCI SD}) + (\text{Mean female MCI} + \text{SD})}{2}$$

According to Rao et al [5] if the calculated Mandibular Canine Index for the individual was higher than the Standard Mandibular Canine Index the individual was considered to be male. If it was the other way round the subject was taken as female. Prediction of sex was done using the same method in North Indian subjects with correct lower anterior dental alignment .The findings were represented graphically.

Fig. 1 Measurement of the greatest mesio-distal width between the contact points of the mandibular canine

Fig. 2 Measurement of inter canine distance between the tips of either side canines of the lower jaw .





OBSERVATIONS AND RESULTS

The following parameters were determined in males and females:

1. Inter-canine Distance.
2. Rights Mandibular Canine Width.
3. Left Mandibular Canine Width.
4. Right Mandibular Canine Index.
5. Left Mandibular Canine Index.

Males v/s Females - The Sex Factor:

From Table 1, it is evident that these parameters as measured for males and females when compared are found to be statistically significant. This indicates that there is existence of a statistically significant sexual dimorphism in the morphometry of the mandibular canines.

Sexual dimorphism in mandibular canine width is depicted in Table 2.

Table 2: Showing sexual dimorphism in mandibular canines

Tooth	Sexual Dimorphism
Right Canine	7.954%
Left Canine	8.891%

Probability of sex determination

Table 3: Showing percentage of cases correctly predicted using Right Mandibular Canine Index (Standard value MCI (Right) =0.273)

Sex	Number	Percentage
Males	21	70%
Females	24	80%

Table 4: Showing percentage of cases correctly predicted using Left Mandibular Canine Index (Standard value MCI (Left) = 0.275)

Sex	Number	Percentage
Males	20	66.67%
Females	25	83.33%

From Tables 3 and 4 it can be concluded that the Mandibular Canine Index is useful in predicting sex in North Indian population to an extent as high as 75%.This method was found to be more reliable in case of females in conformity with the findings of Rao et al [5] and Muller et al [6].

DISCUSSION

The present study establishes the existence of a definite statistically significant sexual dimorphism in mandibular canines. This finding is

Table 1 Showing Statistical Significance of Different Parameters

Parameters	Sex	Mean	±S.D.	CoefficientofVariation	't' Stat	'p' value	Significance
Inter Canine Distance	Male	25.87	1.25	4.84	2.538	<0.006	HighlySignificant
	Female	25.07	1.19	4.77			
Right Canine Width	Male	7.22	0.28	3.87	7.772	$<7.38\times10^{-11}$	HighlySignificant
	Female	6.69	0.25	3.83			
Left Canine Width	Male	7.29	0.29	4.00	7.621	$<1.32\times10^{-10}$	HighlySignificant
	Female	6.69	0.32	4.83			
Right MCI	Male	0.28	0.01	3.57	9.719	$<7.69\times10^{-11}$	HighlySignificant
	Female	0.26	0.01	3.74			
Left MCI	Male	0.28	0.01	4.61	4.088	$<6.76\times10^{-5}$	HighlySignificant
	Female	0.26	0.19	5.27			

consistent with that of work done by other authors [9, 10]. It establishes the inter-canine distance and mandibular canine index as useful parameters in differentiating the sexes. It is the Y chromosome which intervenes most in the size of teeth by controlling the thickness of dentine, whereas the X chromosome, for a long time considered to be the chromosome responsible, only comes into play concerning the thickness of enamel [11, 12].

The mandibular canines are considered to demonstrate the greatest percentage of sexual dimorphism amongst all teeth in their mesio-distal width [13, 14]. For the North Indian population this value came out to be 7.954% for the right canine and 8.891% for the left canine. These values are comparable to the corresponding values of 6.2% and 7.7% computed for the South Indian population [15].

Teeth provide excellent models for the study of relationship between ontogeny and phylogeny. It has been postulated [16] that in the evolution of primates, the canines are functionally not masticatory but are related to threat of aggression and actual aggression. A transfer of this aggressive function occurred from the teeth to the fingers in man and until this transfer was complete, survival was dependent on canines especially in males. Thus in the present day humans, sexual dimorphism in mandibular canines is not merely a coincidence but can be expected to be based on functional activity.

Any measurement of teeth unaccompanied by age, race and sex must be treated with great reserve [16]. In the present study, which is the first of its kind to be conducted on North Indian population; we were able to successfully predict sex to an extent as high as 75%. Similar success has been reported on South Indians [5] and the French population [6]. But such a method of sex determination has its limitations as the sex of the subject to whom the fragment of the mandible belongs can be determined at best if the fragment is found in the geographical area where the subject was born. Besides this implies that it is necessary to make up a random sample of the population from this geographical area to calculate the corresponding standard Mandibular Canine Index.

In conclusion, we think that the standard Mandibular Canine Index is a quick and easy method for determining sex in identification. But one must be prudent in interpreting the results which must be confirmed using other methods of determining sex like the morphometric criteria [17], since the accuracy of prediction using this method has never exceeded 84-87 % in any of the studies.

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SEX DETERMINATION FROM PULPAL TISSUE

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ABSTRACT

It is a well known fact that the sex can be determined from the pulp tissue in living as well as dead, but up to what postmortem interval it can be determined accurately is still a matter of controversy amongst different authors. An attempt has been made in this regard, keeping in view the effect of environment i.e. Role of temperature and humidity on pulp tissue after the extraction of teeth.

KEY WORDS: Pulpal tissue, Sex Determination, Teeth, Odontology, Barr Bodies, F-bodies.

INTRODUCTION

The study of teeth reveals a lot concerning forensic medicine. Particularly it is useful in identification. Forensic Odontology tells us a lot about determination of age from eruption of teeth [1,2,3], and calcification of their roots below the age of 25 years. Boyd's incremental lines for a few months after birth [4] and Gustafson's method for age determination above 25 years [5]

In addition to determination of age sex can also be determined from the teeth. From the morphology of canines sex can be differentiated by studying the mesiodistal crown width, greatest crown length and canine separation width [6,7]

Sex can also be determined by the study of X & Y chromosomes in the cells which are not undergoing active division. Presence or absence of X chromosome can be studied from buccal smears, skin biopsy, blood, cartilage, hair root sheath, and tooth pulp. After death it persists for variable periods depending upon the humidity and temperature in which tissue has remained. X chromatin and intra-nuclear structure is also known as Barr body as it was first discovered by Barr & Bertam (1949). It is present as a mass usually lying against the nuclear membrane in the females [8]

These Barr bodies are found in about 40% of female cells which are known as chromatin positive, and male cells are chromatin negative. It is found only in those cases in which more than one X chromosome is present [4]. Y chromosome can be studied in the cells during interphase by staining with Quinacrine mustard when Y chromosome will fluoresce more brightly and its presence conclusively indicates the Y chromosome and sex in positive cases is invariably male [9].

As temperature and humidity effect the putrefaction so must be the effect of temperature and humidity on the pulpal tissue. In the present work it has been tried to know that up to what time after death we can determine the sex accurately from the study of X & Y chromosomes keeping in view the variation of temperature and humidity.

MATERIAL & METHODS

A total of 100 cases comprising of 50 males and 50 females were studied. Ten cases (5 males and 5 females) were selected out of patients who came for treatment at Government Dental College, Amritsar. The remaining 90 cases (45 males and 45 females) were selected from numerous dead bodies which were brought for medicolegal autopsies to the Department of Forensic Medicine & Toxicology, Government Medical College, Amritsar, at random. Only those cases were studied in which the time since death was exactly known. The dead bodies in which preservation had been done were not included in the present study. In living persons the time of extraction of teeth was noted in the Oral Surgery Department at Government Dental College, Amritsar.

The temperature and humidity of the mortuary, where the dead bodies were received or the extracted teeth were kept were noted by standard Hygrometer consisting of dry and wet bulb thermometer.

The teeth were extracted from the jaw with the help of tooth extractor. The canines or incisors were examined without any distinction. The canines

or incisors were selected preferably as they were easy to break and contained a good amount of pulpal tissue. A group of ten teeth (one each from 5 male and 5 female cases) were examined at intervals as shown in the following schedule.

S. No.	Duration
1	1 – 6 hours
2	6 – 24 hours
3	24 – 48 hours
4	2 – 4 days
5	4 – 7 days
6	7 – 10 days
7	10 – 15 days
8	15 – 21 days
9	21 – 28 days
10	28 – 35 days

Teeth were extracted and allowed to undergo changes in the prevalent atmosphere of the mortuary and examined at intervals as per schedule of the study. Temperature and humidity were noted at the time of study.

Teeth were broken lengthwise by striking with a hammer on the lingual surface at the junction of the crown and the root. The whole of the pulp tissue was separated out of the pulp cavity with the help of needle and forceps and transferred to a conical tube containing normal saline. It was adequately washed in normal saline to remove any calcified bone or dentine particles. The tubes were covered with aluminum foil and transported to the Center for Genetic Disorders, Department of Human Genetics, Guru Nanak Dev University, Amritsar, for further processing.

The pulp tissue was then transferred to the dry and clean conical centrifuge tubes containing 5 ml. of fixative (3 Methanol: 1 Glacial acetic acid) and left as such for about half an hour to 24 hours for the fixation of the pulp cells. It was then crushed / teased with the glass rod sufficiently to isolate the pulp cells. A suspension thus obtained was centrifuged for 10 minutes at 1000 rpm. The supernatant was discarded, leaving behind the pellet in the centrifuge tube. 5ml of fresh fixative was then added to re-suspend the pellet and the process was repeated thrice till a clear suspension of the pulp cells was obtained.

Thin smears were prepared on chilled microscope slides of 1 mm thickness by the air drying method i.e. by dropping 2 –3 drops of the above suspension on the slide from a distance of inches to get a homogenous population of cells. Two smears were made from each suspension of the specimen; one slide was stained with Harris's Hemotoxylin and Eosin stain to study the Barr bodies. The second slide was stained with 5% Quinacrine dihydrochloride for the study of Y chromosome [10].

The first slide was examined under oil immersion lens of light microscope for the Barr bodies. One hundred cells were scanned. The data was collected, compiled, studied, and then analyzed. In the second slide, mounting was done with a few drops of buffer of Ph 5.6 and the slide covered with cover slips of 22 x 40 mm in size & No. 0 in thickness avoiding trapping of any air bubbles. The cover slip was then sealed with nail varnish and the slides were scanned under oil immersion lens (100X), using Carl Zeiss fluorescent microscope having HBO 200 as light source and BG-12 as the excitation filter and OG as barrier filter. Only those cells which contained the characteristic Y chromatin i.e. a brightly fluorescent spot attached to the nuclear membrane were counted as positive cells while those which did not show any such fluorescent spot were labeled as negative.

OBSERVATIONS

Table 1 - In females with the increase in the postmortem number of Barr bodies decreased and we can determine the sex up to about four weeks with certainty when we take in to consideration both Barr bodies and F-bodies. If we don't take into consideration F-bodies, this interval is reduced to 3 weeks. In females maximum number of F-bodies found was eight.

Table 2 - In males with certainty we can determine sex up to four weeks and study of Barr bodies did not increase this interval. Maximum number of Barr bodies in any male was found to be six.

Table 3 - For Barr bodies study temperature up to 35.6 °C is more suitable and if temperature will increase from this, the number of Barr bodies decrease in 15 – 21 days study period and optimum temperature was 28.6 °C to 35.6 °C. For F-bodies low temperature was more suitable but up to 35.6 °C. Temperature did not have much effect.

Table 4 - For Barr bodies –for humidity not

Table 1 – Incidence of sex chromatin in the female cases from the period 1-6 hours to 28-35 days

S. No.	Time Interval	Avg. Temp °C	Avg. RH %	No. of Barr-bodies in females		No. of F-bodies in females	
				Mean ± SD	Range	Mean ± SD	Range
1.	1-6 hrs	30.4	79.6	47.50 ± 4.43	42-52	0.75 ± 0.95	0-2
2.	6-24 hrs	26.6	85.7	34.75 ± 7.08	26-41	5.00 ± 2.16	3-8
3.	1-2 days	19.1	86.2	36.75 ± 2.75	35-42	2.25 ± 2.21	0-5
4.	2-4 days	21.4	82.7	31.50 ± 3.87	24-37	3.00 ± 0.81	2-4
5.	4-7 days	26.8	77.3	26.25 ± 4.03	22-31	3.00 ± 2.52	0-7
6.	7-10 days	24.0	85.5	25.00 ± 4.32	20-31	3.75 ± 1.70	2-7
7.	10-15 days	27.5	80.9	20.50 ± 2.64	18-24	3.50 ± 1.29	2-5
8.	15-21 days	34.5	63.3	15.00 ± 3.74	11-20	1.50 ± 0.57	1-3
9.	21-28 days	39.9	53.2	9.25 ± 2.62	8-13	0.50 ± 0.57	0-1
10.	28-35 days	41.4	51.4	3.00 ± 2.00	0-4	0.00 ± 0	0-0
Mean ± SD		27.6 ± 6.06	71.1 ± 10.75	24.92 ± 3.74	0-52	2.27 ± 1.30	0-8

Table 2 – Incidence of sex chromatin in the male cases from the period 1-6 hours to 28-35 days

S. No.	Time Interval	Avg. Temp °C	Avg. RH %	No. of F-bodies in males		No. of Barr-bodies in males	
				Mean ± SD	Range	Mean ± SD	Range
1.	1-6 hrs	32.2	56.0	76.25 ± 5.90	69-82	1.0 ± 0.81	0-2
2.	6-24 hrs	30.1	76.2	48.25 ± 9.58	33-61	3.5 ± 0.57	3-5
3.	1-2 days	28.8	86.7	44.00 ± 4.96	35-50	2.5 ± 2.38	0-5
4.	2-4 days	21.9	86.5	35.25 ± 3.94	31-40	3.25 ± 1.89	2-6
5.	4-7 days	18.0	81.8	42.20 ± 8.22	30-51	2.0 ± 2.16	0-5
6.	7-10 days	17.8	82.9	38.50 ± 9.39	27-42	0.75 ± 0.95	0-5
7.	10-15 days	19.7	81.1	34.00 ± 11.9	20-47	4.0 ± 1.82	3-6
8.	15-21 days	26.7	81.7	22.75 ± 3.86	15-28	2.5 ± 0.57	1-3
9.	21-28 days	27.6	75.1	13.25 ± 4.99	9-20	0.75 ± 0.95	0-2
10.	28-35 days	26.7	70.1	02.00 ± 2.30	0-4	1.00 ± 2.0	0-4
Mean ± SD		24.0 ± 5.58	78.8 ± 8.58	35.64 ± 6.59	0-82	2.12 ± 1.41	0-6

Table 3 – Effect of temperature on sex chromatin [Barr bodies and F-bodies] from period 1-6 hours to 28-35 days

Temp °C	1-6 hrs		6-24 hrs		1-2 days		2-4 days		4-7 days		7-10 days		10-15 days		15-21 days		21-28 days		28-35 days	
Range	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB
13.4–21.4	-	-	26	-	34.3	-	30.5	41.6	-	38.0	25	36.2	-	33.5	-	-	-	-	-	-
21.5–28.5	-	-	31	50	37.5	35	29.6	33.5	27	-	23.7	-	19.3	24.6	-	22.7	-	12.6	-	0
28.6–35.6	48	75	40.5	44	-	42.5	-	-	-	-	-	-	21.5	-	17	15	-	-	-	-
35.7–42.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.6	-	9	-	1.6	-

F=female; M=male; BB=BarrBody; FB=F-body

Table 4 – Effect of humidity on sex chromatin [Barr bodies and F-bodies] from period 1-6 hours to 28-35 days

Humidity %	1-6 hrs		6-24 hrs		1-2 days		2-4 days		4-7 days		7-10 days		10-15 days		15-21 days		21-28 days		28-35 days	
Range	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M
	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB	BB	FB
46.5–57.5	-	75	-	-	-	-	-	-	-	-	-	-	-	-	13	-	9.25	-	2.4	-
57.6–68.7	-	-	-	-	-	-	-	-	30	-	-	-	-	-	13	-	8.0	10	-	0
68.8–79.9	46	-	26	45.2	-	-	-	-	27.5	43.5	-	46	19	34.5	20	21.5	-	11.5	-	1.3
80.0–91.5	49.3	-	35	-	37.8	42.2	30	40.4	25	43	24	29.6	21	30.6	-	21.3	-	15	-	-

F=female; M=male; BB=BarrBody; FB=F-body

enough data was available to reach a conclusion, probably findings of Barr body is easier at humidity of 68.8 % – 79.9 %. For F-bodies – optimum humidity was 68.8 % - 79.9 % and with increase in humidity number of F-bodies decreased.

DISSCUSSION

Determination of X & Y chromatin

Mean percentage of human tooth pulp showing F-bodies in the males was found to be 35.64% and in females 2.27% which is almost similar to 30% and 4% respectively in the study by Seno and Ishizu [11].

Highest level of F-bodies 82% in this study is almost consistent with 84% of Whittaker et al [12]. Though their mean range of 17.4% - 51.2% in males, and 0 – 16% in females is different from 13.2% - 76.2% in males and 0% – 5% in females. Yet, these ranges are similar to those of Duffy et al [13] i.e. 37% - 75% in males and 0.9% - 4.6% in females. As far as Barr bodies are concerned according to Duffy at el [13] count of Barr bodies in females was 9% - 28% and in males 0% - 6% where as in our study number of Barr bodies in females of 9.2% - 45.7% is higher, yet in males it was almost similar.

Persistence of Sex chromatin

In the study we were able to differentiate sex with certainty up to four weeks only which is almost similar to five week duration of Whittaker et al [12]. Though with decreased accuracy they could determine up to 10 weeks which is in contrast to Seno & Ishizu [11] who gave this duration as 5 months.

Effect of Temperature and Humidity

As far as our knowledge is concerned, no other study has been done keeping in view the temperature and humidity so our results of temperature and humidity may be useful for further studies which are needed to confirm or negate these finding though in an experiment Duff et al [13], they heated the pulp chamber with thermo-couple probe. They found that the sex chromatin could be detected up to 75°C but above this temperature, it was destroyed and could not be detected.

CONCLUSIONS

1. The sex determination from human tooth pulp in cadavers was possible up to a period of four weeks.
2. Mean Percentage of Barr bodies in females was found to be 24.92% +/- 3.74% and the F-bodies to be 2.27% +/- 1.30%.
3. Mean Percentage of F-bodies in males was found to be 35.64% +/- 6.49% and Barr bodies to be 2.12% +/- 1.41%.
4. It was found that accurate diagnosis from human teeth, the number of Barr bodies in female samples should be more than 6% and number of F-bodies in males should be more than 8% up to a period of 4 weeks time since death.
5. There was a remarkable fall in the sex chromatin of pulp cells in the period of 6 – 24 hours.
6. The bacteria, dead cells, and putrefied cellular debris were a constant nuisance in the determination of sex from pulpal tissue. The post-mortem fragility of the cells poses a problem in the separation of cells from the hard pulpal tissue. Thin smears facilitate the clear visibility of the intact and visible cells.
7. A join search for the presence or absence of Barr bodies and F-bodies should be made to establish the sex from human tooth pulp tissue because in tropical countries like India where there are wide variations in temperature and humidity, the pulpal tissue undergoes putrefaction quickly. A negative result of either of sex chromatin may give a wrong diagnosis of the sex of the individual.

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PATHOLOGICAL FINDINGS IN LIVER AUTOPSY

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ABSTRACT

Liver is the site of many diseases, many of which become symptomatic while some are diagnosed only on autopsy. Involvement of liver is secondary to cardiac, metabolic and social problems like alcoholism. In this autopsy study of one hundred cases of liver specimens, fatty change, venous congestion, cirrhosis of liver, malignancy, hepatitis and chronic abscess are reported; fatty change being the predominant finding.

KEY WORDS: Fatty change, liver disease, cirrhosis

INTRODUCTION

Liver is vulnerable to a vide variety of metabolic, toxic, microbial and circulatory insults. In some instances, the disease is primary while in others the hepatic involvement is secondary to cardiac de-compensation, alcoholism or extra-hepatic infections. Quite rightly liver is, called as "The custodian of milieu interior" Autopsy study is useful to monitor the cause of death and to plan medical strategy [1].

Abnormal findings in liver autopsy can be fatty change, hepar lobatum, glycogen storage disease, acute phosphorus poisoning, hemosiderosis, syphilis, actinomycosis, infarcts, cloudy swelling, tuberculosis, acute passive hyperemia, chronic passive hyperemia, amyloidosis, abscess, hydatid cyst, malignancy, cirrhosis and acute yellow atrophy [2].

Alcohol abuse generally leads to three pathologically distinct liver diseases; these are fatty liver, hepatitis and alcoholic cirrhosis. Any one or all the three can occur at the same time, in the same patient [3].

MATERIAL AND METHODS

One hundred specimens of liver of the deceased > 40 years of age, received in the Department of Pathology, Government Medical College Patiala, were examined grossly as well as microscopically.

Postmortems being done in our institutions are usually, cases of road / railway accidents, burns, drowning and poisoning. Liver specimens were received either as a part of examination of multiple viscera, or only liver was taken out from the dead body from mortuary for pathological examination. Moderate to marked autolytic changes seen in the specimens (Figure 1) as they are brought by the police & reach Pathology Department / histopathology laboratory quite late.

Figure 1. Autolytic Changes in liver

Figure 2. Hepatomegaly

OBSERVATIONS

83 specimens were from males and 17 from female deceased. 58 (maximum number) livers weighed between 1500 to 2500 grams, followed by 26 normal-weight-livers, 10 between 2000 to 2500 grams (Figure 2) and 5 were less than 1000 grams; one specimen was more than 2550 grams in weight (Table 1).

Liver weight & sex-wise distribution of the specimens Table 1. Gross & histopathological findings, pathological diagnosis and age & sex distribution of cases of fatty change, cirrhosis & congestion of liver are summarized in tables 2, 3, 4, 5, 6 and 7.

Table 1. Liver weight and sex

Liver Wt. (gm.)	Male	Female	Total
< 1000	5	0	5
1000-1500	16	10	26
1500-2500	51	7	58
2000-2500	10	0	10
> 2550	1	0	1
Total	83	17	100

Table 2. Gross findings

Size	Wt.	Color	Consistency	Cut surface	No.
Inc.	>N	YellowGreen	Firm	Nodular	15
Inc.	>N	YellowBrown	Soft	Greasy	34
Slight inc.	>N	RedBrown	Soft	Nutmeg	7
Slight inc.	N	Normal	Cystic lesion	Fluid cyst	1
Slight inc.	N	GreenishGrey	Soft	Greenish	12
N	N	Normal	Soft to firm	Normal	31
Total					100

Table 3. Histopathological findings

Histo. findings	Cases
Fatty Change	39
Cirrhosis	14
Ch. Congestion	9
Hepatitis	3
Malignancy	3
Ch. Abscess	2
Normal	30
Total	100

Table 4. Pathological diagnosis

Histopath	Male	Female	Total
Fatty Change	32	7	39
Cirrhosis	13	1	14
Venous cong.	8	1	9
Hepatitis	0	3	3
MalignancyPrimary	1	0	1
MalignancySecondary	2	0	2
Ch. Abscess	1	1	2
Normal	26	4	30
Total	83	17	100

Table 5. Age & Sex of Fatty Change Cases

Age	M	F	Total	%age
41-50	14	7	21	53.85
51-60	14	0	14	35.99
61-70	2	0	2	5.13
71-80	1	0	1	2.56
> 80	1	0	1	2.56
Total	32	9	39	100

Table 6. Cases of Cirrhosis

Age	M	F	Total	%age
41-50	5	1	6	42.85
51-60	4	0	4	28.6
61-70	4	0	4	28.6
71-80	0	0	0	0
> 80	0	0	0	0
Total	13	1	14	100

Table 7.Congestion of liver

Age	M	F	Total	%age
41-50	6	1	7	77.8
51-60	0	0	0	0
61-70	1	0	1	11.11
71-80	1	0	1	11.11
> 80	0	0	0	0
Total	8	1	9	100

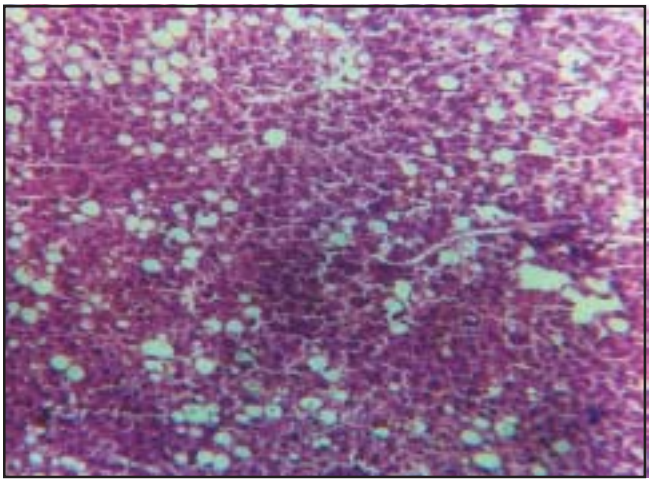

Figure 3. Microscopy - Fatty Change Liver

Figure 4. Metastasis Liver

DISCUSSION

Daily intake of alcohol between 40 to 80 gm increases the liver weight and frequency of fatty change liver (Savolai 1993). Out of 100 livers of individuals above 40 years of age, 30 were normal and 39 had fatty change (Figure 3). In this region, a large number of individuals in this age take alcohol daily.

Both benign and malignant or epithelial and mesenchymal neoplasms arise in liver. Of the malignant tumors, metastatic are more common than the primary cancers, rarely a mesenchymal hamartomatous lesion can arise in the liver [4, 5]. In the current study, all the 3 cases of malignancy were metastatic tumors (Figure 4), two adenocarcinomas and one sarcoma. These were incidental cancers, the deceased were males above 55 years of age.

Venous congestion of liver is terminal end stage of the death seen in most of the liver autopsies. Copeland (1985) reported congestion with fatty change in 3.4% of liver autopsies of alcoholics who died suddenly. The present study revealed congestion in 9% cases, slightly more as compared to Copeland's findings.

SUMMARY AND CONCLUSION

The study consisted of 100 autopsy livers, 83 M and 17 F (M: F = 4.88: 1). Maximum cases (39%) had fatty change fatty change liver followed by normal livers (30), cirrhosis (14), congestion (9), hepatitis (3), malignancy (3). Maximum liver weight was 2550 and minimum was 850 gm. Fatty livers were seen between 41 to 60 years of age with M: F as 4.6:1.

More cases of fatty change can be attributed to more alcohol consumption in Punjab, in & around Patiala (Patiala Peg).

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PARA SUICIDE - AN APPROACH TO THE PROFILE OF VICTIMS

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ABSTRACT

Suicide is the second commonest manner of unnatural death flanked by accident and homicide. Unlike suicide which terminates the human life forever, its counterpart, 'Para suicide' paralysis the human life either temporarily or permanently. Para suicide could not be taken as a lighter entity in the modern times, for it may prove as equally dangerous as suicide itself and sometimes perhaps more than that.

The present study is an analysis of the spectrum of Para suicide in the terms of various sociodemographic / epidemiological features. The study presents the profile of suicide attempters, who reported / were brought to the Kasturba Hospital, Manipal, Coastal Karnataka, South India, over a span of twelve months with an alleged history of attempted suicide.

The study sample comprised of 52 subjects who survived the attempt of suicide. Men (56%) considered as more vulnerable than women. Urbanites (80%) outnumbered the rural dwellers (20%). Thirty six percent of the attempters were in their third decade of life. Fifty six percent of the victims had had their education up to the Secondary School. Manual laborers (23%) were most vulnerable when compared to the skilled laborers and professionals (4% each). Ninety four percent of the subjects were the followers of Hindu religion. Married individuals (52%) and those from lower middle class sector (70%) attempted suicide more often. Presentation is concluded by the suggestion of probable preventive measures.

KEY WORDS: Para suicide, sociodemographic features, suicide, unnatural death.

INTRODUCTION

It is a time proven fact that all the living organisms on this earth fight for survival and existence. What then makes the man to risk his own life? The tragedy of self-inflicted death has always attracted the attention of the medical as well as the legal fraternity. Although it is quite obvious that one has to 'attempt' suicide in order to 'commit' it, it could be held that the event of attempting suicide need not always have death as its objective.

Para suicide is thus defined as a 'conscious and voluntary act which the individual has undertaken in order to injure himself, and which the individual could not have entirely be certain of surviving, but where the injury has not led to death'. The term 'Para suicide' is used synonymously with 'attempted suicide' to express the fact that it is a phenomenon which is close to or similar to suicide but nevertheless different.[1] Parasuicide is the problem of major concern in today's society, which sometime or the other affects the lives of a significant proportion of the population. The incidence of parasuicide is greatly influenced by the differences in age, sex, race, religion, culture, marital status, habitat, climate and social systems. [2]

MATERIAL AND METHODS

The study was conducted in Kasturba Hospital, Manipal, Coastal Karnataka, South India, over a span of twelve months, from 1st February 2001 to 31st January 2002. The said hospital is situated on the rocky hillocks of Manipal, catering to the needs of Coastal Karnataka and the adjoining districts of Karnataka, and also to the neighboring States of Kerala and Goa. During this period, 82 cases of suicide and parasuicide were reported. Of this, 52 survived the attempt, which constituted

the material for present study. These subjects were reported to / brought to the departments of Casualty, Medicine, Psychiatry, Surgery, and Orthopedics. The subjects were given ordinary in-patient ward care and / or intensive care as per the need of the circumstance. After they were stabilized, an interview was conducted by providing a preset questionnaire to them personally in their respective wards of admission. Relevant information was also gathered from their relatives, friends and caretakers. The information so obtained was tabulated and analyzed.

Exclusion Criteria: Those who subsequently died following complications of the act were excluded from the study.

RESULTS

During the twelve-month span of the study period, 82 cases of suicide and parasuicide were reported to Kasturba Hospital, Manipal. Sixty four percent of the subjects have survived the attempt of suicide. Men (56%) surpassed women (44%). Majority of the victims (39%) were in their third decade of life. (Table 1) Eighty-one percent of the study sample was urban dwellers. Fifty six percent had had their education up to Secondary School. (Figure1) Manual laborers (23%) topped the list followed by students (21%) and housewives (20%). (Table 2) Subjects from lower middle class attempted suicide more often (70%). (Figure 2) Ninety four percent were the followers of Hindu religion. Married people (52%) had outnumbered the unmarried ones (48%). 85% of the victims lived in nuclear families. Only 6% of the victims lived alone at the time of attempting suicide.

Table 1 - Age of the Victims in Years

Age	No. of Cases	Percentage
<19	6	11.53
20-29	20	38.46
30-39	17	32.69
40-49	7	13.46
50-59	2	3.84
Total	52	100

Table 2 - Occupation of the Victims

Occupation	No. of Cases	Percentage
Manual Laborer	12	23.0
Student	11	21.2
House wife	10	19.3
Clerical	9	17.6
Unemployed	6	11.6
Skilled laborer	2	3.8
Professional	2	3.8
Total	52	100

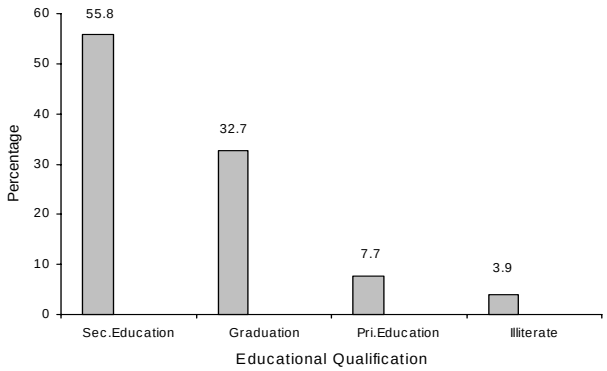

Figure 1: Educational qualification of the Victims

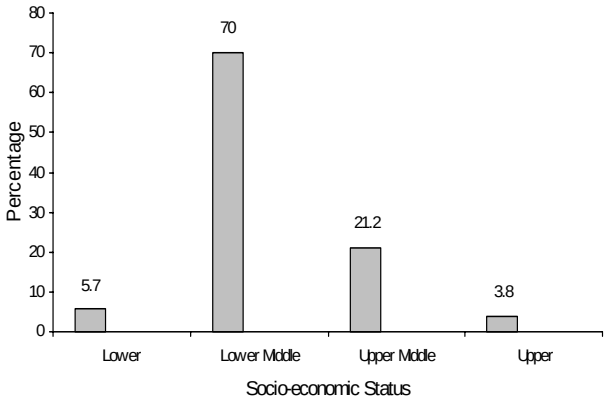

Figure 2: Socio-economic Status of the Victims

DISCUSSION

Of the total 82 cases reported, 64% survived the attempt of suicide and 36% succumbed to it. Men (56%) outnumbered women. This is consistent with the studies of Osama A & Lonquist, 2001, Eferakeya 1984 & Howtan et al. 1998. [3-5]. But this is in contrast with the observations of Bhatia et al. 2000, Tuzun et al. 2000, Blumenthal, 1990, Platt et al. 1988, Wunderlich et al. 2001, 6-10 where women have outnumbered men in non-fatal unsuccessful attempts. Majority of the victims were in their second decade of life (38.46%) followed by those in third decade (32.7%). The young people are much more prone to get shattered by the turbulence of life easily. They opt for deliberate self-harm over trivial issues and make non-fatal suicidal attempts, where the intention to kill may be lacking. [1,11-13]

Eighty one percent of the study samples were urban dwellers. The more demanding urban life styles may be the instrumental factor for this. Those who have had education up to Secondary School constituted the major bulk of the study population (56%), followed by university graduates (33%). Low education is considered as an important risk factor. [8,14]. Like our observation, Tuzun et al, 2000, report 23.4% of victims as University graduates. [7]. Manual laborers topped the list (23%) followed by students (21%), housewives. (20%) Skilled laborers and professionals occupied the last position (4% each). This could be explained on the grounds that, manual laborers, due to illiteracy, ignorance and poverty, attempt suicide more often than the other sectors of the society. Our findings are consistent with those of Bhatia et al and Singh et al. [6,15] But Tan 1986, has shown that skilled and administrative professionals are at a higher risk of attempting suicide [16]. Subjects from lower middle class attempted suicide more often (70%), followed by the upper middle class (21%). People from the upper class constituted the least bulk (4%). People of lower middle class, who by virtue of their hand-to- mouth existence, fail to nurture their dreams may attempt suicide more often

Ninety four percent were the followers of Hindu religion followed by Christians (4%) and Muslims (2%). This reflects the prevailing population in this part of the country. Irrespective of the religion, the entire study population admitted that they strongly believed in their respective religion / God. This reflects the custom and tradition, which is confided in them. Married people have outnumbered (52%) the unmarried ones (48%). This is in contrast with most of the Western studies where highest incidence of parasuicide was observed among unmarried and lonely individuals. [17-20]. But our findings are consistent with Indian literature. [6,15]. Our study shows that, in Indian set up, different psychological factors related to marital or family life might be operating for parasuicide. Eighty five percent of the victims lived in nuclear families against 15% who lived in extended nuclear families. The more demanding nature of nuclear families, coupled with stress, strains and adding fuel to the fire, there is no one to shoulder their agony, may drive these people to attempt suicide more often than their counterparts who are somewhat 'secured' in the larger families.

Ninety four percent of the victims were living with the family at the time of attempting suicide. Only 6% lived alone at the time of the act. Even though this is in contrast with the Western literature which correlates high risk of suicidal attempts in people living alone, [18-22] could be explained by the fact that Indian culture and tradition gives utmost importance to the concept of 'family' and a very small proportion of the people opt to live alone. This is amply supported by the available Indian literature. [6,15,23,24]

The probable preventive measures to tackle parasuicide would be adopting de-stressing programmes for the stress prone urbanites, providing better education and increasing the pecuniary status by creating job opportunities for the underprivileged and upholding the family bondage in the nuclear families.

This study attempts to illustrate that epidemiological analysis of the local data of parasuicide may show trends, which are similar to large-scale trends in certain aspects. This approach will hopefully lead to a better understanding of the phenomenon of parasuicide and the ultimate identification and intervention of high-risk individuals.

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TRENDS OF ORGANOPHOSPHORUS POISONING IN BHOPAL REGION AN AUTOPSY BASED STUDY

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ABSTRACT

Organophosphorus pesticides are frequently used group in agriculture, forestry and public health and hence they are easily accessible. The study was therefore undertaken to evaluate in depth the various trends of acute organophosphorus poisoning cases and to evaluate the influencing factors and precipitating factors. This study which was made in Gandhi Medical College, Bhopal from June 1999, to May 2001, deciphers the various individual compounds belonging to Organophosphorus group in accordance with the chemical analysis done in Forensic Science laboratory of Medicolegal Institute Bhopal.

KEY WORDS: Organophosphorus, Cypermethrine, Pyrethroids.

INTRODUCTION

The incidence of organophosphorus poisoning has steadily increased in recent past and has reached a level where it can be called "a Social Calamity". Though these substances have been in market only for few decades in our country, they have created many serious problems since these compounds are been preferred in most suicides because of their rapid action, ready availability and knowledge of lethal potency. So this study was undertaken to know the Epidemiological factors in relation to poisoning.

Organophosphorus compound as such is not a single compound rather a broad category of compounds with LD 50 range from 1 to 5000 + mg/kg. This suggests that compounds having high LD 50 might not be fatal indicating that magnitude of Organophosphorus poisoning faced by autopsy surgeon is only a tip of iceberg.

MATERIAL & METHOD

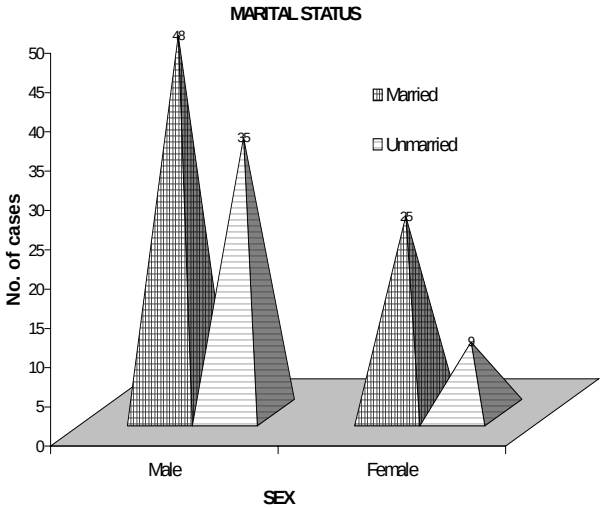
This study is an autopsy-based study of 117 cases of Organophosphorus Poisoning brought to the mortuary of Gandhi Medical College, Bhopal, in the time span of 24 months, from June 1999 to May 2001.

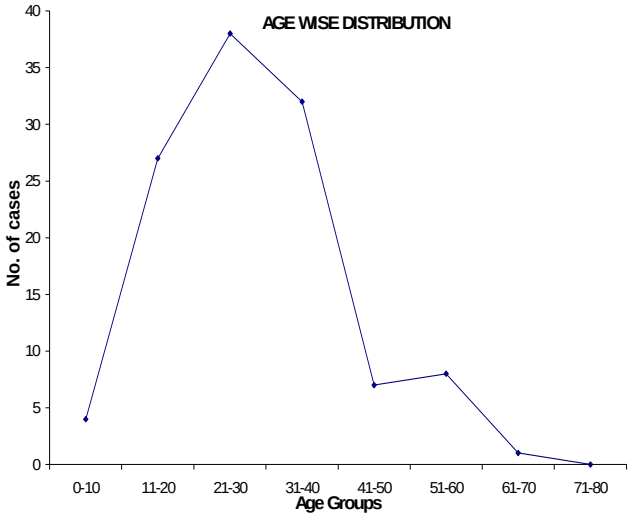
Following procedure was adopted:

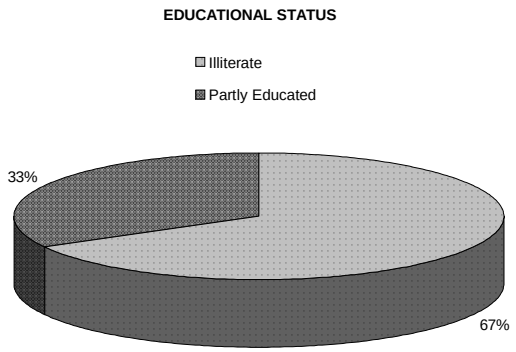
1. Relevant history taken from police & relatives - Detailed information of each case was recorded on the pre-coded proforma.
2. Procedure of taking samples in Mortuary: Care was taken to prevent contamination of viscera. Stomach and its contents taken in one clean wide mouth plastic jar and small pieces of liver, kidney, spleen and lungs in separate bottle.
3. Methodology adopted in Toxicology Laboratory:
   - A) Solvent Extraction Methods for insecticides
     i. Isolation - By mixing macerated tissue with equal amount of anhydrous sodium sulphate and 100 ml acetone then extraction is done.
     ii. Clean up procedure - The concentrated acetone extract further diluted and then extracted thrice, with 25ml of chloroform which is then combined, washed with 50 ml of water and acetone mixture (1:1) and finally with 50ml water. The washed chloroform layer is passed through anhydrous Sodium sulphate and then evaporated, just to dryness.
   - B) Screening test
     i. Color test
     ii. Paper chromatography method
   - C) Thin layer chromatography method
   - D) High performance liquid chromatography method

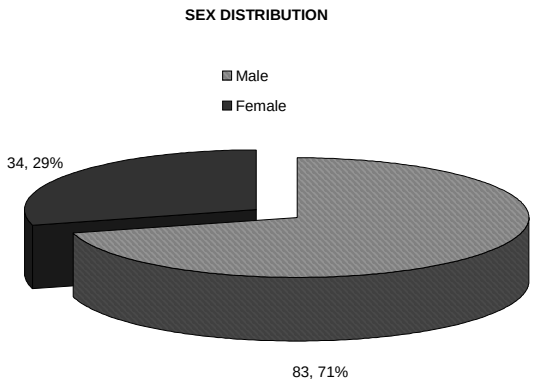
OBSERVATIONS

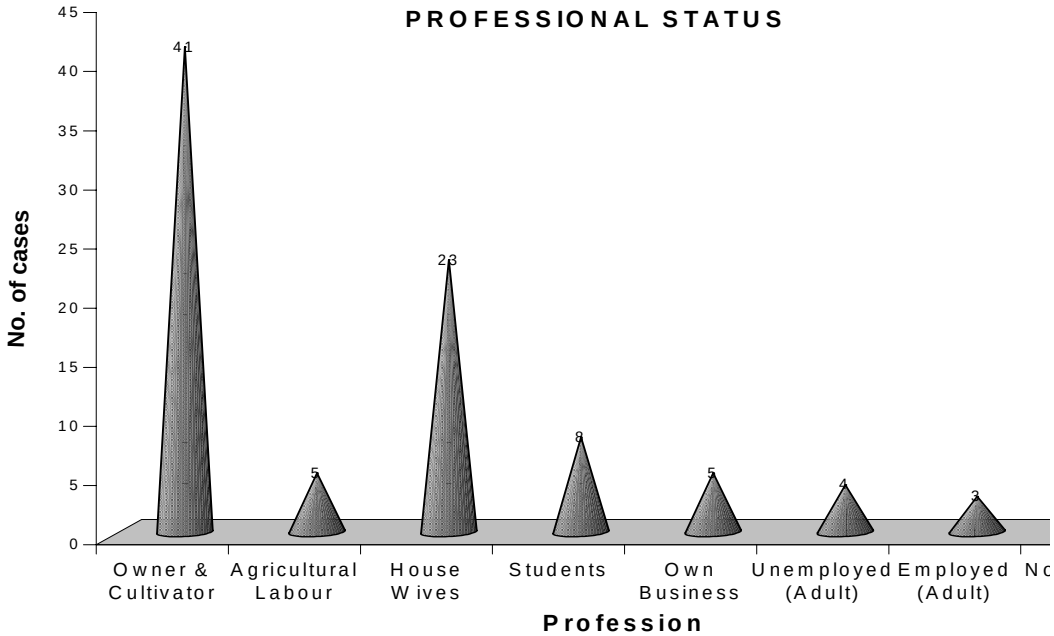
A statistical observations made during the study has been represented in the form of pictorial diagram.

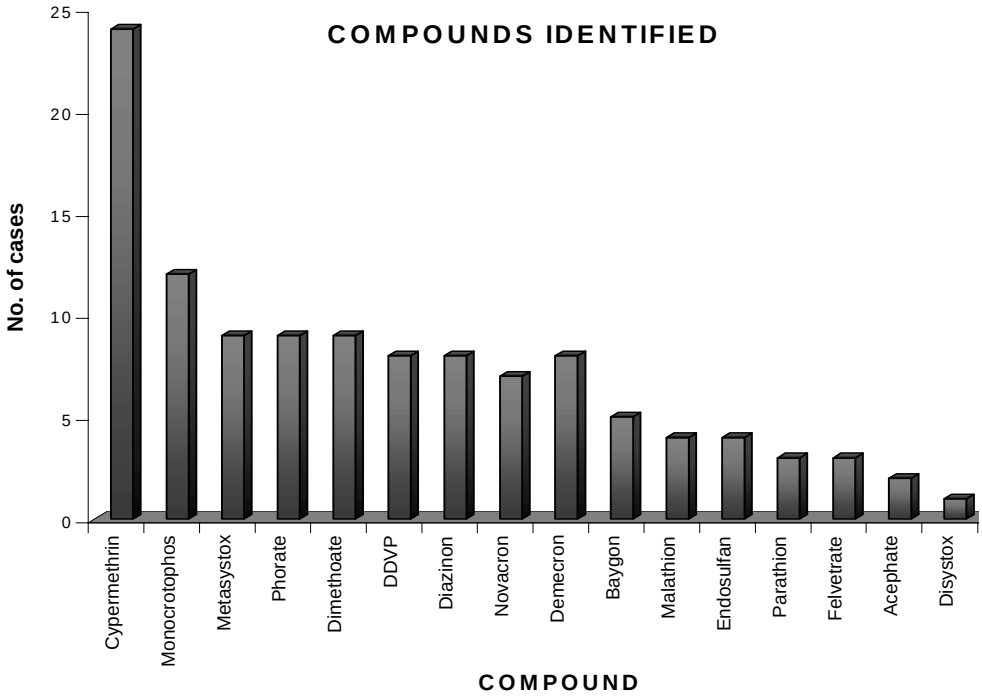

MARITAL STATUS
Married
Unmarried
No. of cases
SEX
Male
Female
48
35
25
9


AGE WISE DISTRIBUTION
No. of cases
Age Groups
0-10
11-20
21-30
31-40
41-50
51-60
61-70
71-80


EDUCATIONAL STATUS
Illiterate
Partly Educated
33%
67%


SEX DISTRIBUTION
Male
Female
34, 29%
83, 71%


PROFESSIONAL STATUS
No. of cases
Profession
Owner & Cultivator
Agricultural Labour
House Wives
Students
Own Business
Unemployed (Adult)
Employed (Adult)
41
5
23
9
5
4
3



DISCUSSION

Recent developments concerning Pyrethroids are quite remarkable. They are fast becoming the most potent group of synthetic insecticide ever to enter in the market. With the modification of both alcohol and acid sides, they are also becoming stable enough to be used for agricultural purposes. Cyano groups at a - position of alcohol moiety increases insecticidal activity of Cypermethrine. This trend however varies with the area concerned and easy accessibility, like studies carried out at metropolitan cities like Chennai, Pune, and Mumbai; showed household insecticides like TIK-20 (Diazinon), a common offending agent. Similarly a study at Aurangabad revealed a highest trend of Monocil, Thimate, Endosulphan and Rogar (Dimethoate) in decreasing frequency. In SriLanka most agents are Dimethoate, Methamidophos, Malathion, Monocrotophos and Fenthion. Death from pesticides poisoning in England and Wales suggest that although Paraquat poisoning has decreased but still is the commonest compound detected.

38 cases out of the total 117 cases belong to 3rd decade of life (21 to 30 Years) i.e. 32.4 %. Next in frequency is the age group 31-40 age i.e. 27.3 % and then 11- 20 years i.e. 23 % .Only 4 cases occurred in age group 03 to 07 years when the manner of death was accidental. No cases were seen in age group between 8-13 yrs. It was suggested that, on account of better understanding of dangers associated with poison, they can differentiate between a poison and non poison. Moreover stress related with problem of life does not seem to have mounted over their innocent and careless attitude.

The common risk factors associated with 2nd decade of life are stresses of school work, bullying, failure at school, unsuccessful in love affairs, conflicts with parents etc. In group associated with 3Td decade is the most active group physically, mentally and socially and hence highest number of suicides is seen in this section of population.

According to a study made in Ahmedabad about half of the cases belonged to 3rd decade of life. According to Siwach et al 70 % of poisoning is seen in age group between 15 – 30 years. Similarly Gupta & Patel et al & Vishwanathan & Shrinivasan et al had highest incidence in 3rd decade of life.

Males significantly outnumbering the females, indicating a high turmoil in them due to their direct touch with changing values of society & life and scientifically proved less patience and resistance becoming an ideal victim of some evil mind. Similar results were projected in various studies like - Mutalik et al, Mehta et al, etc.

Most of the victims are either partly educated or illiterate, which coincides with the

studies made by Aggarwal S B et al and De and Chatterjee et al.

It is interesting to note that out of 34 females 25 were married and 9 were unmarried i.e. Married females are almost three times in frequency to that of unmarried females. In Indian conditions the women after marriage has to leave her house and join an entirely new family with different conditions, rituals and customs. If the age is a tender one the circumstances become very sensitive. Social, financial stresses and devil of dowry causes the loss of patience.

Most of the married females who consumed Organophosphorus were from the joint family while married males were from nuclear family explaining the fact that males are in greater tension when alone since they have no one from his family to console or encourage the morals in difficult situation. Dattarwal et al observed 66.55 % cases of poisoning among married, coinciding to the observation of our study.

Highest incidence of Organophosphorus Poisoning is seen in persons engaged with agricultural fields constituting 39.60 % followed by house wives 20 % and students 16.85 %. This subgroup has easy accessibility and more turmoil. Student in addition to this have tender age to bear the turmoil hence bad results.

Studies made by Siwach et al, Dattarwal et al and Rathod et al correlate well with the present study.

CONCLUSIONS

1. The most common compound involved in this time span of 24 month was Cypermethrine.
2. In 24 cases of Organophosphorus Poisoning, alcohol in significant concentration was also detected during chemical analysis.
3. Males outnumbered females in Organophosphorus Poisoning. Male to female ratio in Bhopal region was 2.44: 1.
4. Married candidates were more affected than Unmarried candidate. Married female committing suicides by Organophosphorus Poisoning were above three times the unmarried females.
5. Most common age group involved in Organophosphorus Poisoning in Bhopal region was 21 - 30 years, which form 32.47 % of total study case. Most of the cases belong to the age group between 14 years to 40 years accounting for 82.9 % cases. Only three cases were observed to be below 14 years and 16 cases above 40 years.
6. Poisoning was observed to be most common in persons involved associated with farming. Housewives and students came in subservient sense.
7. Most of the cases were partly educated while 33.33 % were illiterates. None of the graduate or professional was found to be the victim.

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TORTURE AND A DOCTOR

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ABSTRACT

Modern media today emphasize about on going humanitarian & human rights disasters. The latest torture these days is characterized by adopting technological sophistication that leaves behind few physical traces. Nonetheless, agencies such as Amnesty International have provided convincing proof of applying torture in many countries. 'The Lancet' highlights evidence that doctors, physician assistants, nurses, medics at Abu Gharaib assisted in or remained silent in the face of prisoner abuse. Lieutenant Colonel Joe Richard, a spokesman for the Pentagon criticized the Lancet article as a "broad – brushed indictment" based on "allegations" [1]. But if the Medical faculty is able to document the victims in a fair manner they can come out of these allegations.

This article is a miniscule contribution to the medical faculty to inculcate awareness about the degrading, inhumane act(s) and how one can go about to curb or eradicate the same.

KEY WORDS: Torture, inhumane, medical faculty

INTRODUCTION

Torture and violence have been identified since time immemorial. There are tales, which tell us about the Kings torturing their subjects, or prisoners of war or thieves in order to keep the empire under control. The application of torture is to dehumanize the victim. Of late, torture has emerged a worldwide phenomenon. Torture is considered unjustified and illegal under any circumstances. According to a recent report of the Amnesty International, the Governmental torture takes place in 65 out of the 144 countries studied. [2] Considering the ethical value of a doctor it is imperative on part of one self to protect the individuals from such treatment by effective investigations & documentations to provide evidence of torture & ill treatment so that torturers are made accountable for their actions [3]. The reason behind torturing an individual has not changed much but the methods employed for torturing have changed.

Istanbul Protocol Manual defines torture as "any act by which severe pain or suffering, whether physical or mental, is intentionally inflicted on a person for such purposes as obtaining from him or a third person information or a confession, punishing him for an act he or a third person has committed or is suspected of having committed, or intimidating or coercing him or a third person for reason based on discrimination of any kind, when such pain or suffering is inflicted by or at the instigation of or with the consent of acquiescence of a public official or other person acting in an official capacity". It does not include pain or suffering arising only from inherent in or incidental to lawful sanctions [4].

The main purpose of torture is to deliberately disturb not only the physical and emotional well-being of individuals, but grading the dignity and will of the community as a whole.

Types of torture:

a) Physical torture

b) Psychological torture

Methods of torture have changed; traditional methods mainly used physical pain, where as modern torture involves psychiatric, pharmacological & psychological techniques more than physical pain [5].It has been challenging for the doctors to scrutinize the allegedly tortured victims or individuals to document and present in a fair manner.

Frequently, victims themselves do not reveal the torture experience to the doctor; for the fear of reprisals, be overwhelmed by humiliation, or be reluctant to retrieve painful memories and fear stigmatization to themselves and their families [6].But the victims may approach a doctor when once the symptoms develop, as the modern torture effects are seen after a long time [7].

PHYSICAL TORTURE [8]

1. Beatings:
    a. In general
    b. To the soles of the feet (falanga, falaka, baatinada)
    c. With the palms on both the ears simultaneously (el telefone)
    d. On the abdomen, while lying on a table with the upper half of the body unsupported (operating table, el quirofano)
    e. To the head.
2. Suspension:
    a. By the wrist (la bandera)
    b. By the arms or neck
    c. By the ankles (mercelago)
    d. Head down, from a horizontal pole placed under the knees, with the wrists bound to the ankles (parrot's perch, jack, pau de arara)
    e. Bhutanese technique – tight clamping of the thighs or legs with bamboo, sometimes for a number of days. The torturer may press the two sides of the clamps with his legs or may stand on the two sides of the clamps (chepuwa) [9].
3. Near suffocation:
    a. Forced immersion of head in water, often contaminated (wet submarine, pileta, latina)
    b. Tying of a plastic bag covering the head and face (dry submarine)
    c. Gagging
4. Electric:
    a. Torturing with electric shocks, usually placing electricity terminals in the vagina, mouth, anus, or over testicles and nipples [10].
    b. Heated metal skewer inserted into the anus (black slave).
5. Sexual abuse:
6. Forced posture:
    a. Prolonged standing (el planton)
    b. Forced straddling of a bar (saw horse, el cabellete)
7. Miscellaneous:
    a. Dehydration
    b. Animal bite (spiders, insects, rats, mice, dogs etc.)

The methods employed by the torturer depend on the available sources and the methods commonly employed in their locality earlier.

PSYCHOLOGICAL TECHNIQUES [2]

1. Coercion technique: Constrain or forcing or threatening the individual to reveal thing(s) that would be beneficial for the threatening/forcing party.
2. Deprivation technique: Deprivation from food, sleep, health service, hygiene, nutritional, sensory.
3. Incongruent acts: That is violation of one's culture or religious norms, such as forcing to eat beef or pork that amounts to spiritual torture for higher caste Hindus [9].
4. Cultural shock: severe distress caused by a major cultural change is termed cultural shock. This condition arises when individuals suddenly find themselves in a different culture in which they feel completely alien e.g.: - American jailers in Iraq made their prisoners of war to listen to heavy metal songs [11].

The most common forms of torture encountered during various studies are severe beatings, threats, humiliation, suspension, sexual violations [12, 13].

The most common complaints are headache, various cardio pulmonary symptoms, and sleep disturbances with nightmares, impaired concentration, memory and emotional instability [12, 14.]

The most common long term Psychological sequelae of torture are Post Traumatic Stress Disorder (PTSD) and Traumatic Stress Related (TSR) symptoms. In a survey 9.4% of participants showed PTSD and 76-78% showed TSR symptoms [15].In another study 11.8% had all symptom criteria for PTSD, 54.4% had anxiety symptoms and 38.8% had symptoms of depression [16].

Thus the study results revealed that psychiatric morbidity related to human rights violations, traumatic events, and terrorism has a long-term effect on one's life.

The medical community dealing with torture victims should have a general idea about the types, and sequelae of torture before going further into management of the case. The critical evaluation of

data collected during in depth interviews with torture victims is the core of documentation of torture.

ROLE OF DOCTORS

- Investigate and document medical evidence.
- Treat torture victims and his / her family.
- Prevent torture.
- Oppose any form of physician involvement in torture.

Descriptions of where and by whom examinations were conducted and the reporting of information in a format that would ideally include history, physical and psychological findings and diagnosis would greatly improve communication between health professionals as well as facilitate the evaluation of information on this topic. Thus, health professionals are in a unique position to foster the prevention of torture.

The Istanbul protocol [17] which provides the guidelines or footsteps at each and every level is to be followed by the doctors for proper management and documentation.

One has to remember to

- Avoid the procedures reminding the victim of torture he or she has been subjected to.
- Provide physical & Psychological treatment simultaneously.
- Treat the entire family of the torture victim.
- Document the findings in a prescribed format as per guidelines (Istanbul Protocol).
- And rehabilitation should be a part of the treatment.

CONCLUSION

Having some such basic knowledge about torture one can strive to get justice to the victims and to the society. The doctors armed with such knowledge about torture will be in a better position to probe into this degrading nature with relevant technical skills and they can manage to treat and rehabilitate the torture victims but also document the evidence in a unique way to foster the prevention of torture. Such evidence can attract international attention on human rights abuses even when they are totally denied by various groups and governments that commit them.

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MASS DISASTERS: A PREPAREDNESS PLAN BOOK WITH PARTICULAR EMPHASIS ON MORTUARY SERVICES

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ABSTRACT

This paper tries to prepare a "preparedness plan book" which can be used as a ready reckoner in case of disaster strikes. This is particularly meant for mortuary services but can also be used as a guide for other health care services as well. It covers the anticipation of the problem, role of mortuary services, requirements and their procurements in the hour of need. It also deals with some relevant ethical and legal issues.

KEY WORDS : Disasters, Manpower, Mass Communication, Preparednes

Disasters can occur any time, any place and in any whether. Disaster is a calamity or a sudden misfortune. According to Colin Grant disaster is a catastrophe causing injury and illness to thirty or more people. The normal system of a hospital or an organisation cannot bear it and there is disequilibrium of the hospital as a system.

According to different places, situations etc certain number of disasters can even be expected each year. In India it is not uncommon to have an accidents etc involving multiple persons (more than thirty) affected and few or many of them dying. Disaster could be a railway or bus accident or sinking of a boat or floods or collapse of land etc. [Full classification of disaster is out of place in this talk.]

Once we know that disasters are not uncommon we can be prepared for them. That can be achieved by having disaster plan. In U.S.A., accreditation demands a written disaster plan and two drills each year.

The **Disaster Plan** should have the following features-

- It should be simple and understandable by all.
- It should be flexible and fit different types of disasters.
- It should be clear and concise-even in noise and confusion; the staff should be able to act upon it instantaneously.
- It should be adoptable during all hours- day and night including holidays.
- It should be an extension of normal hospital working so that people can act upon it immediately in a routine manner.

We should also **anticipate** the areas because of which there may be **problems**. These are:

- Delay due to havoc.
- Delay or other problems(s) due to non-or inadequate availability of immediate medical need and care.
- Due to disorganisation.
- Due to delay in transport.
- Due to inadequate recording and preservation of data etc.
- Due to delay in post-mortem examination, this could be due to over crowding.
- Due to delay in submission of reports.

We must know and admit that preparedness for disaster is an opportunity to strengthen skills of all concerned. It is a community problem therefore community must be involved in it that can be done by making community leaders committed, we can communicate with them, do planning with them and strengthen the capacity to respond. The fundamentals could be:

- prepare the community,
- train all sorts of people, and
- Ensure that they are ready.

The first 24 to 48 hours are most decisive.

This **Preparedness Plan Book**, we may call it *Holy Book* rather than blue book or protocol book, should be ready in advance. It should be kept at very easily accessible place. Unfortunately the government system and mentality of government staff tends to be secretive. This book should also include particular type of signals, sirens, codes;

colour dresses etc for particular work or information. Team should be so motivated that action should be very prompt. There should be early, rapid and constructive communication to and fro among all concerned. The staff should know their work.

Management of disaster is multifaceted. This is true in a management of hospital related part of disaster management also. In a mass disaster of any kind medically and medico legally we are concerned with multiple things. Our **duties** could be:

- To treat the victims
- To assess their disabilities.
- To certify cause of death.
- To conduct post-mortem examination.
- To dispose the dead bodies.
- To preserve evidence.
- To record the chronology of the event.
- To preserve the record.

To execute our duties **we require**:

MANPOWER

- Expert doctors.
- General duty doctors.
- Trained Class III staff. *
- Trained Class IV staff. *
- Administrator.
- Public relation officer(s).
- Secretarial staff.
- Communicators or social workers.

* These cadres not only include personnel pertaining to hospital related work like operation theatre assistant or nursing staff etc but also include drivers, computer operators, electricians, plumbers and so on.

To mobilise staff and manpower local resources must be explored. These could include NGOs, various bodies of doctors, various social groups, and even individuals. A comprehensive list of all those who are willing and mobilised and motivated may be prepared. They may be asked to fill up half a page proforma, which may contain brief bio data containing their addresses, telephone no e-mail addresses and their areas of interests, field of work, experience in that field etc.

SPACE

According to the quantum of disaster space is required. It is to be created temporarily. The space is required for:

- Treatment of sick persons. That may include indoor and out door.
- Post-mortem examination.
- Preservation of dead bodies till relatives claim or the organisation disposes them.
- Store is required for drugs and instruments etc., to store evidences, to store records etc.
- For coordinator
- For displaying information
- Guest rooms for emergency staff and additional staff, and
- Catering etc.

INSTRUMENTS AND EQUIPMENTS

They are required for:

- For treatment- cots, mattresses, stretchers, drugs, surgical set up, infusion set up and so on. A comprehensive list according to speciality may be prepared.
- For post-mortem examination.
    - o Tables or make shift tables, instruments, gloves, cotton, packing and labelling material, sealing material, preservatives, whole body size polythene bags, suitcase size polythene bags or paper bags, small bottles from the capacity of 20 ml to 100 ml, 1000 ml bottles, sutures etc,
    - o Cold room or alternative arrangement,
    - o Equipments for photography and videography,
    - o Communication system like black boards and white boards, telephones, computers, Net, public address system, banners etc, and
    - o Clothes to cover dead bodies.
- Biomedical – antiseptics and disinfectants both for treatment and for post-mortem purposes.
- Routine supply of light and water.
- Additional supply of light and water.
- Alternative supply of light and water.

TRANSPORT

Multiple vehicles for multiple purposes like:

- Transportation of sick,
- Transportation of staff,
- Transportation of material, and
- Transportation of dead bodies.

It is a fact that anticipating disasters we cannot have excess of all (man, machine, material, space)

all the time at our disposal. That will be too costly and non manageable. Therefore to procure them in the hour of need what can we do? How can we get them? We have already talked about preparing a list of persons in case of manpower. We can do the same thing here. A comprehensive list or chart can be prepared speciality wise of all those things, which are required to cop up such situation. In that chart against each item we can put the source from where we can procure it. For example, we should know if cold room is not working, where could we get ice from? Are there cold rooms in the city? Can we use the refrigerated trucks, which are used for transport of ice cream? Where can we get them from? Similarly item wise source can be mentioned. As far as possible this source should be local. Whatever information we are putting in the protocol book should be complete. And it should also be up dated periodically. Say if address is written it should be full postal address with telephone no, mobile no and e-mail address etc.

TRAINING

It is observed in government service and set up that if a nurse is working in an operation theatre she works there for decades or through out her life. If a sweeper is working in a drainage system or in a post-mortem room he works there similarly. This system may have advantages, I do not deny. But this system does not allow other nurses or sweepers to train and tune in this job. And therefore in the need of hour when they are posted at such places not only they are apprehensive but they are failure also. Therefore all persons should optimally be trained to do other jobs of their fields. This training part is very important particularly when specialised work is rather concerned like operation theatre, post-mortem, intensive care unit etc. Rotational duties and training can be easily done during peacetime. This aspect is again important in relation to manpower, which is going to come from community and not the part of hospital. They may be enthusiastic and sincere and committed but may not be trained and tuned. Other than professional training for a particular work, manpower does require constant hammering for attitudinal and work ethics type of matters also.

Mass communication is required to prevent rumours, to calm public, to ask for additional help and similar motives. But it should be appropriate-talk less, work more.

VIPs must also be educated how to approach such situations. Those who have studied pat disasters their experience suggests that a VIP visit put more strain and stress on already crumbling system. These can be minimised.

Post-mortem examination in all cases of mass disaster deaths is not required under Indian laws. What law requires is establishment of identity and cause of death. Therefore in known cases where the cause of death is prima facie obvious even investigating officer can summarise the cause of death and hand over the dead body for last rituals, please refer Cr. P. C. 174 and 176.

APPREHENSIONS OF NEGLIGENCE AND PROFESSIONAL MISCONDUCT

For doctor medico legally and ethically whatever applies to any normal situation applies to disaster situation also. It is advised that doctors should have reasonable knowledge of professional ethics, professional misconduct and areas of and ingredients of negligence. While treating patient they may come across a situation of triage. The triage is a medical action of prioritising treatment and management based on making a diagnosis and formulating a prognosis. This should be decided comprehensively based on all factors like medical need, resources available and medical capabilities available. The work of triage should be assigned to a senior physician, who may be ably assisted by others. The physician should separate victims as follows:

1. Victims that can be saved but whose lives are in immediate danger, requiring treatment straight away or as a matter of priority within the next few hours;
2. Victims whose lives are not in immediate danger and who are in need of urgent but not immediate medical care;
3. Injured persons requiring only minor treatment, who can be treated later or by relief workers;
4. Psychologically traumatized victims needing to be reassured, who cannot be taken care of individually but who might need reassurance or sedation if acutely disturbed;

5. Victims whose condition exceeds the available therapeutic resources, who suffer from extremely severe injuries such as irradiation or burns to such an extent and degree that they cannot be saved in the specific circumstances of time and place, or complex surgical cases requiring a particularly delicate operation which would take too long, thereby obliging the physician to make a choice between them and other patients. For these reasons, all such victims may be classified as cases "beyond emergency care". The decision to "abandon an injured person" on account of priorities dictated by the disaster situation cannot be considered "failure to come to the assistance of a person in mortal danger". It is justified when it intends to save the maximum number of victims.
6. Since cases may evolve and this change category, it is essential that the official in charge of the triage regularly reassess the situation.

It is unethical for a physician to persist, at all costs, at maintaining the life of a patient beyond hope; thereby wasting to no avail scarce resources needed elsewhere. However, the physicians must show his/her patients compassion and respect for the dignity of their private lives, for example by separating them from others and administering appropriate pain relievers and sedatives.

The physician must act according to his conscience considering the means available. He should attempt to set an order of priorities for treatment which will save the greatest number of serious cases that have a chance of recovery and restrict morbidity to a minimum, while accepting the limits imposed by the circumstances.

In selecting the patients who may be saved, the physician should consider only their emergency status, and should exclude any other consideration based on non-medical criteria.

Relations with the victims are governed by first-aid medical care and the state of need, with the result that the need to protect patients' best interests shall be respected, if possible, by obtaining their consent in the immediate emergency.

The physician has a duty to each patient to exercise discretion and ensure confidentiality when dealing with the media and other third parties, and to exercise caution and objectivity and act with dignity in respect to the emotional and political atmosphere surrounding disaster situations.

The ethical principles, which apply to physicians, also apply to personnel under the physician's direction.

SOME PROTECTION

The World Medical Association calls upon Member States and insurance companies to establish a form of diminished responsibility or responsibility without misconduct to cover both civil liability and any personal damages to which physicians might be subject when working in disaster or emergency situations.

SOME MORE PROTECTION

The WMA requests that governments:

1. Afford assistance and protection to foreign physicians and accept their action and their appearance and presentation, (e.g. Red Cross, Red Crescent) without discrimination on the basis of race, religion, etc.
2. Give priority to the rendering of medical services over visits of dignitaries.

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CORPUS DELICTI - A CASE REPORT

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ABSTRACT

Genesis of crime is multifactorial. It may have trivial background or may be well planned. With *mens rea* having all the components like motive, preparation and execution etc. Sometimes identification is big problem in dead bodies and in other cases so right identification altogether changes the scenario of the Crime.

KEY WORDS : Corpus Delicti, Identification, Injuries

Common brutal crimes relate to enmity associated with land disputes, love affairs, dacoity, thefts, money matters etc. At times crime is perpetrated to save family honour. Similar case was reported to department of Forensic Medicine, Government Medical College, Amritsar. On 14.2.02 burnt dead body of a female was brought with two inquest reports and two claimant parties. One party claimed that it is dead body of Mrs.X w/o Mr.Y Other party claimed it is dead body of Ms.A d/o Mr.B. So apart from routine autopsy for ascertaining cause of death, investigating officer demanded few more clarification like age and stature of deceased (in relation to her identification). Autopsy was conducted by the board of doctors who observed following findings.

1. Naked dead body 5 feet in length covered with shawl above and bed sheet below with belonging lying by side (a *dupatta*, printed *salwar* and *kameez*, *mauli*, coconut, seven red coloured bangles, a metallic (wristlet) *curra*, pink ribbon, under wear, tuft of scalp hairs and burnt pieces of clothes).
2. Dark red nail polish on toes nails and nails of left hand.
3. Tongue was caught in between teeth and exposed part had carbonaceous soot. Eyes were partially open (Fig. 1).
4. No *linea nigra, linea albicantes* were present.
5. Vulva was not gaping, vestibule was narrow.
6. Rigor mortis was present in short muscles of finger nails and toes and in ankle and knee muscles.
7. Post mortem staining was present on back of body except areas of contact flattening. There was no expression of milk on squeezing nipples.
8. THERMAL INJURIES: Burns were 65% epidermal involving head, face, neck, both upper arms, front of chest, front of abdomen, right thigh; sparing front and lower half of left thigh, upper 1/3 of right leg, lateral aspect of left leg. Eye lashes, eyebrow, scalp hair, auxiliary, public hairs and other body hairs were partially burnt / singed. Lips were thick and everted. Facial features were bloated (Fig 1). Charring and black soot was present at some areas. Heat fissure present over right shoulder. Patch of marbled skin was present over front of thigh. On cut section, red line of demarcation present between burnt and un-burnt tissues.

Fig. 1

Fig. 2

Fig. 3

9. MECHANICAL INJURIES:
    a. A reddish brown abrasion 2 x 0.6 cm on front of right leg in its middle.
    b. Two reddish brown abraded bruises 0.3 x 0.1 cm each 0.5 cm apart in arched fashion in front of left fore arm 1.5 cm below cubital fossa.
10. On dissection, tissues were cherry red.
11. Genitalia Examination: Hymen was intact, vagina admitted one finger with difficulty, rugosities intact, uterus measured 3" x 2" x 1", fundus at level of broad and round ligament, no scar on uterus, weight of uterus was 63 gm. Uterine cavity contained blood clots. External os was transverse, regular without fissure, wall of uterus was convex. Uterine cavity on dissection was triangular; cervix and body of uterus were of same length. Arbor vitae present in cervical canal. Internal os was well defined (Fig 2).
12. On dissection of cranium: Membranes and brain were congested.
13. On dissection of chest cavity: Thymus gland was present in anterior mediastinum weighing 33 gm (Fig 3). Larynx, trachea, pleurae and lungs were congested. Right lung weighed 367 gm, left lung weighed 267 gm. On cut section blood stained froth came out. In Pericardium no abnormality was detected, Heart was of 213 gm. Right side was full of blood, left side was empty.
14. On dissection of abdomen: Peritoneum was congested stomach was healthy contained 30 cc light coloured fluid. Small intestine was healthy contained chyme. Liver weighted 1231 gm and was congested. Spleen weighed 131 gm and was congested. Right kidney was of 110 gm and was congested. Left kidney was of 132 gm and was congested. Bladder was empty and no abnormality was detected in it.
15. Dental status: 28 permanent teeth were present, 3rd molar had not erupted yet.
16. Radiological assessment of age. Dead body was subject to X ray of hip joint and iliac crest, wrist, elbow, sternum and shoulder. The radiological estimated age of deceased was approximately between 14 ½ to 15 years.
17. Piece of sternum and skeletal muscle were taken and handed over for DNA profiling (though not requested by investigating officer) if need arose later.
18. "From autopsy and other investigations cause of death was suffocation leading to asphyxia as a result of ante mortem burns. Age of victim was 15-16 years and she was nulliparous". Thus it was established that the dead body is of Ms. A d/o Mr. B beyond any doubt.

DISCUSSION

As Ms.A d/o Mr.B (Deceased) was working as a maid servant in the house of alleged deceased (Mrs.X w/o Mr.Y). But Mrs.X was having an illicit relation with Mr.Z (Paramour). One day both Mrs.X and her paramour (Mr.Z) conspired to elope from the town. But to save the repute of the family of Mrs.X, she asked her maid servant Ms.A to stay overnight at her home due to some domestic compulsions. But during the night Mrs.X eloped with

Mr.Z and Ms.A was killed and an attempt was made to obliterate the identity so that the dead body may resemble of Mrs.X. But meticulous and scientific medicolegal autopsy leads to the complete identification of deceased. Though routine points for establishing identity like age and sex were taken into consideration, but new and different factors which played an important role along with routine points were well developed thymus gland and genital organs of a virgin (nulliparous female especially arbor vitae) (Fig 2 & 3).

Though the role of Thymus gland in sudden death is cited in the literature but no where its role in identification is mentioned. At birth, the Thymus is large relative to total body weight. Its absolute weight increases in the first two years after birth, but its relative weight decreases. There is little change thereafter until about seventh year, when rapid growth again occurs to reach a maximum at about eleven years. After this it begins to decline to an adult weight which is variable but averages 12-15 gm. In old age, it shrinks still further. But in present case the weight of Thymus was 33 gm which itself medically proves that deceased was an adult person (Gray's Anatomy 1, 98). The presence of arbor vitae and other features of nulliparous uterus further strengthened the medical opinion that the dead body did not belong to Mrs.X who had two live born living children. The above mentioned medical facts concluded that the dead body belonged to young unmarried female. Thus the police inquest under section 174 CrPC was set aside and *challan* was filed under section 302 IPC.

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A CRITICAL ANALYSIS OF STAB WOUND ON THE CHEST A CASE REPORT

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ABSTRACT

Penetrating Injuries on the chest may be homicidal, suicidal or accidental in nature. There are certain features that are quite reliable pointers to the nature of these injuries. However differentiation is difficult particularly when the characteristics of stabbing are perplexed and information related to circumstances of the incident is misguiding. The present case projects the importance of careful examination of the stab wounds on the chest particularly when the information provided to the autopsy surgeon is ambiguous.

KEYWORDS: Stab wound, homicidal, suicidal, critical analysis.

INTRODUCTION

Penetrating injuries of the chest are most commonly the result of stab wounds and are often associated with a range of potentially life threatening injuries [1].In medico-legal practice, many a times the autopsy surgeon has to give his opinion about the homicidal or suicidal nature of death. But this becomes difficult in many cases due to various reasons. It is often seen that the witness misguides an incident of murder. The reasons for this could be to avoid involvement in the case and subsequent court attendance; fear from the actual murderer, to save the accused or merely out of ignorance [2]. The unskilled investigating officer may further mislead the case by projecting the case as suicide without thorough investigation.

When the victim has sustained a single stab wound on the chest, the interpretation becomes more difficult. Such a wound can be homicidal, suicidal or accidental. The homicide and the suicide intending to injure the heart may well choose the same target area i.e. the left lower quadrant of the front of chest [3]. A critical analysis of various characteristic features of the stab wound may help to determine the manner of death.

CASE REPORT

A profusely bleeding, semiconscious, 22 year old male was found lying on the floor of his house. There was no eye witness of the incident. His younger brother told that on the fateful day while having their lunch together they had a minor scuffle over food. He left the house and after an hour when he returned, he saw his brother in the above-narrated condition. He then took him to the Emergency Department of Govt. Medical College & Hospital Chandigarh. . However he could not be revived and succumbed to injury within 3 hours of hospitalization. The medico legal autopsy was conducted 18 hours after the death. As per investigating officer it was a case of suicidal self-stabbing, without any eyewitness of the incident.

Autopsy Findings: External Examination:

1. A stab wound 2cm x 1cm x chest cavity deep vertically placed on the left side of front of chest

Figure - 1

Figure - 2

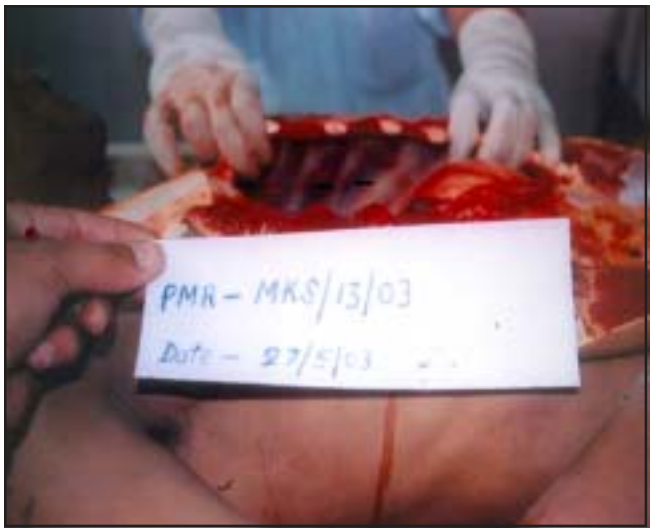

Figure - 3

at the level of anterior axillary line. Upper angle of wound was 17 cm below the tip of shoulder & 15cm to the left of midline. (Fig.1)

2. A stab wound 2cm x 1cm x muscle deep, horizontally placed on the front of the left arm 11cm below the tip of shoulder. (Fig.1)
3. Multiple linear brownish, scabbed abrasions over the area of 8cm x 3cm on the flexor aspect of middle of left forearm. Abrasions were parallel to each other and outwards to inwards. (Fig.2)

Internal Examination: Dissection of the thoracic cavity revealed two wounds in the chest wall (Fig.3). The upper wound was present in the 4th inter-coastal space near left anterior axillary line directed upwards, backwards and medially, perforating the upper part of lower lobe of left lung. The second wound was present in the 5th inter-coastal space near left anterior axillary line directed downwards, medially and backwards, perforating the lower lobe of left lung and entering the apex of heart, ending in its muscle mass. The lower part of anterior descending branch of left coronary artery was cut. 2000ml of liquid and clotted blood was present in the left thoracic cavity. The cause of death was opined as hemorrhagic shock.

DISCUSSION

In this case although there was no doubt about the cause of death, yet the real challenge was to opine whether the stabbing was suicidal or homicidal in nature. In India, one of the most frequent ways of committing homicide is by inflicting injuries with a sharp cutting or stabbing weapon. Precise examination of such injuries may reveal a sizeable number of clues which may be of paramount importance in reconstruction & interpretation of the whole events [4].

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A Critical Analysis of Autopsy Findings

The fatal injury was a vertically placed stab wound on the chest at the level of left anterior axillary line. It is reported that existence of vertical chest wounds implies homicide [5]. Chest wounds in suicides appear most frequently to be horizontal [6,7]. After carefully reconstructing the direction of stab (from examination of surface wound & direction of the track of wound during autopsy) it was found that the blade of the knife entered the chest at an angle directed from lateral aspect. (Fig.1). It is highly inconsistent for any person to self inflict an injury with a weapon hitting the chest at an angle directed from lateral aspect at the level of anterior axillary line. The site of the wound has particular importance, obviously if it lies in position which is inaccessible to the victim; it is not self - inflicted. [3]

Externally there was a single wound of entry but internally there were two separate tracks entering the chest cavity through two separate inter-coastal spaces. Hence it indicates that the weapon was first thrust in, partially out and in again in a different direction. Such maneuver in a case of self-stabbing is highly inconsistent. The assailant may manipulate the weapon in different ways, capable of producing bizarre or atypical wounds [8]. Direction of the stab entering the 4th inter coastal space was upwards, backwards and medially. A track which passes downwards may be due to

homicide or suicide, but an up-going track is normally indicative of homicide rather than suicide. [3]

Presence of linear abrasions (tentative cuts) on the wrist may indicate suicidal tendency of the deceased, but age of these injuries did not correlate/ coincide with the fatal stabbing. Healing of these linear abrasions (brownish scab present) suggested that these were inflicted 2-3 days prior to fatal stabbing. The presence of tentative cuts is a presumptive evidence of suicide, but exceptions do occur. Bernard Knight has reported two murder cases in which 'typical' injuries on the wrist / throat caused considerable doubt to the investigators until other factors clarified the situation [9].

Thus after carefully analyzing the autopsy findings it was concluded that possibility of suicidal / self-stabbing was remote. It was suggested to be a case of homicidal stabbing. After receiving this opinion the investigating officer restarted the investigation. The present case projects the importance of careful examination and interpretation of the stab injuries.

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A PECULIAR CASE OF BULLET, BURNS AND BOOT

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ABSTRACT:

Medico legal study of different cases of burns. In this case, the accused tried to hide the actual cause of death, by burning the car along with the body, after shooting him. However careful examination has brought the accused to justice. It is very important for forensic specialist to visit the scene of crime and get detailed history of cases burns from investigating officers and use all branches of forensic medicine to solve crime.

KEY WORDS: Burns, Bullet, Boot

CASE REPORT:

A half burnt dead body was found in partly burnt car's boot (dickey). The male body was half naked and was in cramped knee-elbow position, the boot was locked. After the visit to the scene of the crime the boot of the car was opened. Face was extremely burnt with hair sniggered; blood was oozing from nose and ears. Face was not recognizable. A wooden club was also seen next to the body in the boot. Body was shifted to morgue. It was straightened, cleaned and examined.

External Examination

A small circular wound of about 1 cm in diameter burned hole was found in the left temporal region. It was partly covered by semi burnt hairs. No other external injury was detected.

Radiological screening of the body revealed an opaque bullet shaped shadow in the right parietal region. X-ray of the skull was taken and on magnification of the image it was confirmed as that of a bullet.

Internal Examination

Skull was opened and brain removed. A small (lead) bullet was found in the brain matter in the right parietal lobe, just below the meninges. There was no evidence of soot in the trachea giving the clue that the burns were post-mortem in nature. Other internal organs were partly congested.

Ballistic expert report

The removed bullet was sent to the ballistic department. The expert was of the opinion that it was a 6 mm rifled firearm bullet (pistol). Only the elite army officers used such weapons.

DISCUSSION:

During examination of partly or totally burnt bodies in obscure places or under mysterious circumstances, care should always be taken to search for evidence of any crime other than the apparent burns. It is usually common for the assailant to burn the body after the assault to conceal the earlier crime.

In another case, blade of knife was found in the abdomen the handle made of plastic was burnt and broken, only the X-ray of the body could reveal that actual crime was stab wound which was the cause of the death and not burns. Burn cases are always deceptive and disturbing to the investigating officers and police surgeons.

In another case of partly burned female body, foetal bones in the abdomen was seen in X-ray suggestive of pregnancy and iron wire around the neck, death was due to strangulation and not burns, due to illegal pregnancy.

Importance should be given to scene of crime, history and time since death. Due to hi tech electronic media and exposure to western films, criminals are learning new methods of committing crimes. As forensic medicine experts

we should update their knowledge about patterns of crimes, should be one step ahead of them in detection of the crimes and giving exact medico legal opinion.

CONCLUSION:

The owner of the burnt car was traced and the friends of the victim were screened. One of the friends was in elite army service (Presidential Guards) who was subjected to interrogation. On sustained interrogation he confessed that he had shot his friend with a 6 mm pistol on the left temporal region and then put the body in the boot and drove a long distance and set the car on fire.

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TIT FOR TAT - AN AXE FOR A MACHETE A CASE REPORT

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ABSTRACT

A case where both the victim and the assailant are killed on the same day is not common. In this paper, a case is reported where the victim is killed first by the assailant and then the assailant is killed by an angry mob on the same day. The violent nature of the crime, the weapons used and the motives are highlighted here.

KEYWORDS: Double Homicide, Chop wounds, Machete, Axe in-situ.

INTRODUCTION

Homicidal wounds are usually multiple in numbers, deep and dangerous in character and are frequently situated over the head, neck, chest and abdomen [1]. The nature of these injuries depends upon the nature of the weapon and is frequently associated with defence wounds [2].

A machete is a big heavy carving knife, almost as big as a sword, but broader and heavier. An axe is a heavy weapon with a blade and a long handle. Both weapons were used in this case of double homicide. The axe was found in-situ on the body and the nature of the chop wounds agree with the weapons of causation. Insanity and revenge as motives are also highlighted.

CASE REPORT

On 26/07/04, two cases were registered in an Imphal P.S. under consecutive FIR's. The first case stated that a 65 yr old man had been killed by an insane person who had just come out of jail, using a machete. The incident occurred in the house of the victim. Multiple chop wounds were found on the head and face, size ranging from 6.5 cm x 1. 5 cm to 14 cm x 2 cm, all brain deep with beveled margins and almost parallel to each other. There were also defence wounds in the form of bruises and cuts, on the outer aspect of both forearms. The nature of the injuries supported the allegation that they were caused by a machete. The death was opined to be due to laceration of the brain and fracture of the skull and homicidal in nature.

The second FIR stated that the assailant had been killed on the same day by an angry mob in retaliation, using an axe and other blunt objects. On autopsy, the body was weighing 63 kg with a stature of 5'3", of medium built and fair nutrition. Wearing apparel consisted of a blood-stained loin cloth only.

Rigor mortis was present all over the body. Post mortem staining was present on the back and fixed. One axe(8.2"x 2.5" blade x 36" handle) was found in-situ over the face and the bridge of the nose embedded up to the hilt, with dry stains of blood running across the face, chest, hands and right thigh. Bleeding was seen from the mouth, nose and ears.

Photograph 1 - showing the body with the axe -n-situ

External injuries consisted of

1. A chop wound 7 cm x 2cm x brain deep (axe in-situ is removed) obliquely placed with bruised margins, over the face, around the bridge of nose with fracture of frontal, nasal, and maxillary bones.

2. Multiple lacerated wounds size ranging from 1.5 cm x 0.5 cm x bone deep to 7 cm x 1 cm x scalp deep, with red margins on various parts of the head.
3. Multiple abrasions, contusions and cuts, size ranging from 1 cm x 0.5 cm to 8 cm x 2 cm on the limbs, chest and back.

Internally all the skull bones were fractured and meninges and brain were lacerated at various places. Stomach was empty.

The death was opined to be due to injury to the brain resulting from multiple blunt force injuries on the head and chop wound on the face, homicidal in nature.

Photograph 2 - Chop wound on face after removal of axe

DISCUSSION

A homicide is defined as willful killing of one human being by another where motives are usually violent altercation, sudden provocation, self defence, revenge, retaliation, alcoholism, gang related, sex related, drug related, insanity etc. [3]

In this case report, the first victim was killed using a machete but the assailant was an insane person who had been jailed for assaulting his own daughter-in-law with a similar weapon and he had no known grudge against the present victim. So, insanity as a cause of homicide is evident here. The weapon and the multiple natures of the injuries indicate a sudden impulsive murder.

The mob retaliated in anger and used an axe in the heat of the moment. The axe found in-situ in the wound is rare and is an interesting and confirmative finding of the cause and circumstances of the death.

Multiple injuries varying in type and location on various parts of the second body indicate multiple assailants namely the mob.

Broken portion of the weapon of offence, if present inside the wound will give a strong indication of homicide and identification of the weapon of offence. Multiple severe wounds suggest homicide. [4]

The interesting aspect of this case is the “tit for tat” nature of the circumstances surrounding a double homicide. It can however be concluded that an “axe for a machete” is in fact a shocking example of the extent that even sane people can be propelled by anger to take the law into their own hands.

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DIFFICULTIES OF ASSESSING PRECISE AGE IN OLD PERSONS A CASE REPORT

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ABSTRACT

We report a case of an elderly person who alleged his age to be eighty five years, was referred from Health secretary as directed by the Honorable High court of Karnataka. The individual presented himself alone to the District Hospital for the examination and certification by the District surgeon. A panel of doctors was constituted, who examined the person individually and reported to the concerned authority. Surprisingly the age was found to be less by 25-30 years. This paper focuses on the difficulties faced by the experts in opining the age of elderly individuals.

KEY WORDS: Alleged age, Dental status, Radiological examination

INTRODUCTION

The age of an individual up to 25 years can be determined with certainty in a range of one to two years, by a combination of data. But after 25 years of age, one can opine within a range of five - ten years [1]. But assessing the age of an elderly for the reason of getting pension or retirement benefits poses a problem, as the exact age cannot be determined. This report focuses on an elderly individual who alleged to be 85 years but on examination found to be 50-60 years.

CASE REPORT

The individual who was referred by Health secretary as directed by Honorable High court, presented alone to the District Hospital for examination on the specified date. Under the chairman ship of District surgeon a panel of doctors was constituted to examine the individual. The Panel members were a dental surgeon, an Ophthalmologist, a dermatologist, a Physician, a Radiologist and a Forensic expert.

The individual was examined personally by each expert of the Panel and expressed their opinion. Finally we examined the individual the details of which are below. The individual was an agriculturist, married with four surviving sons. He gave written consent to carry out the appropriate examination. Two identification marks were noted. On examination the individual was well built and well nourished, weighing 80 kg and of 176 cm in height. Chest girth at the level of nipples was 97 cm and abdominal girth at the level of navel was 107 cm. Scalp hairs were 3-4 cm black, mixed with few white hairs. Beard and moustache were grey. Axillary hair and body hairs especially on the chest were black. Upper part of the pubic hairs was black. As the person was not co-operative for genital examination and pubic hair examination, the whole of the pubic hairs and genital could not be examined.

On dental examination, few teeth (six in number) were missing. There were generalized brownish stains on the remaining teeth. Teeth showed attritional changes. Dental surgeon reported the individual is above fifty years and said that upper age could not be ascertained.

For Radiological examination, X-ray skull - lateral and oblique view (with neck structures) X-ray chest - lateral view to see sternum was taken. Findings were:

1. Manubrium was not fused with body of sternum.
2. Xiphoid was fused with the body.
3. Greater cornua of hyoid were not fused with the body.
4. Lambdoid suture was not fused (estimation of age of skull suture closure is not reliable)
5. Tracheal cartilage calcification was not seen.

Radiologist opined the age is above fifty years.

Ophthalmologist on examination opined that vision was 6/6 but need presbyopic glasses. Physician observed that the person was hypertensive but did not ascertain the age. Dermatologist also did not opine on the age.

At the end we compiled the opinion of each expert and gave our opinion as regards to age, the

individual is aged more than fifty years and less than sixty years.

Finally in consultation with all the examined experts of Panel, District surgeon opined the age to be more than 50 years and less than 60 years.

DISCUSSION

The accuracy of age estimation during later half of life poses problem and it is not an easy one. In this particular case, the person presenting himself alone to the examining authority arose suspicion about the age as told by him. This is because; as per Indian environment it is difficult for a person of 85 years of age to come alone to the Hospital that too traveling from his native place to District Head quarters. Hairs on the head tend to become grey usually after forty years and silvery white in advanced old age. Chest hair and pubic hairs begins to turn grey usually after the age of 50 years [2]. This was not so in this case.

Some forms of psychological function may decline with age. For e.g.: Memory capacity and information processing capacity may become restricted from quite early in adult life [3] but these impairments were not seen in this particular case. So he was not subjected to psychological examination.

The Problems of geriatric namely in Continence, Hearing impairment, Visual impairment and joint pains were not encountered in this case.

Based on above-mentioned findings we came to the conclusion that the age of the individual is between 50-60 years.

CONCLUSION

Apart from taking X-rays of certain bones, subjecting the individual for just general examination, it is advisable to examine the individual thoroughly. The person has to be examined by a dentist, a psychiatrist, ophthalmologist, ENT surgeon, physician and orthopaedician.

Finally Forensic expert having done the general examination in consultation with all these experts can come to a near precise age of an elderly (old) age person. However the difference of 5-10 years cannot be reduced even at this particular juncture.

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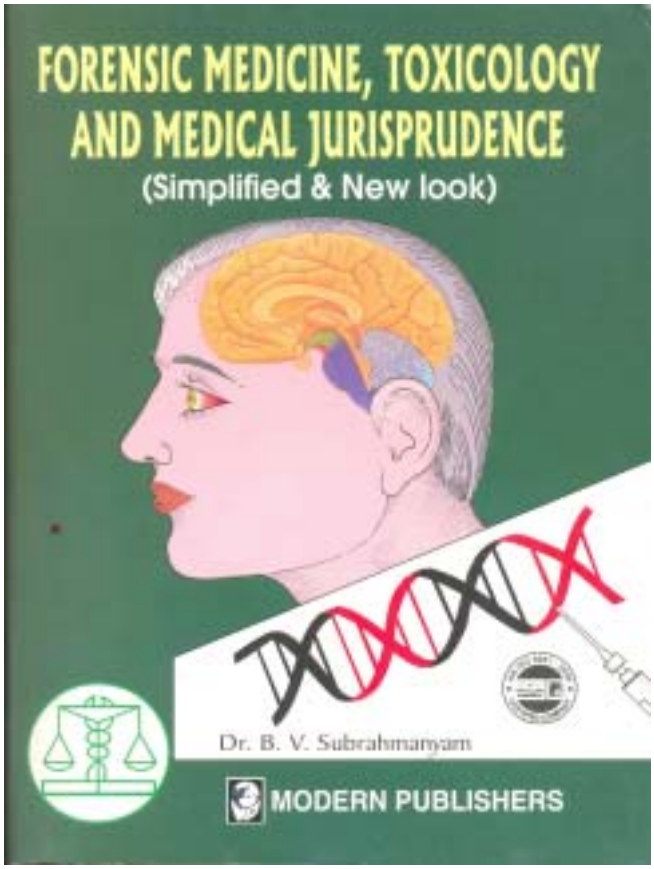
BOOK REVIEW



The book Forensic Medicine and Jurisprudence (Simplified and new Look) written by well known Dr.B.V.Suramanyam is a handy book which has covered all the topics needed for undergraduates. The book is suitably illustrated. It has the advantage of inclusion of multiple choice questions and answers which will help students preparing for competitive examinations. It has a nice look, good quality printing and is conveniently priced at Rupees 300. Various forms and certificates used by forensic Medicine experts have also been suitably appended in this book. Latest in the field of Forensic Medicine has also been included to make this book up to date. This book will be of immense help to the students and persons interested in Forensic Medicine.

Prof. R.K.Gorea

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Unpublished original manuscripts, written in English should be sent to: Dr. R.K.Gorea, Editor, JIAFM

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