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From Editor's Desk

I was overwhelmed by the great faith that you had imposed upon me by electing me as editor in chief of your prestigious journal. I feel a great satisfaction that I have tried to do my duty honestly and sincerely. It is my proud privilege to present before you the last number of the journal during my tenure well in time. It gives me a sense of fulfillment that by the grace of the God I have been able to bring all the eight issues of the journal well in time. I seek your forgiveness for any shortcomings with my efforts. Once again I thank you for your continued support to the editorial board.

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Editorial

DEVELOPMENT OF FORENSIC NURSING IN INDIA STEP BY STEP

Many new subspecialties are developing in the various scientific fields. Their introduction and development usually face same kind of problems. Same is true about forensic nursing. Forensic nursing started as specialty in USA and then it traveled to various parts of the world like Sweden, South Africa, Japan, Singapore and Malaysia. In India Virginia Lynch visited in Dec.2002. Introductory seminar was held in the Govt. Medical College, Patiala where doctors, nurses, Judges, advocates and police officials gathered together and they were introduced to the concept of forensic nursing and its utility to the investigating officers and the judiciary.

It was followed with similar lectures in the various parts of the Punjab. Many nursing schools and meetings of police officials were covered by Virginia Lynch and me.

Due to all these efforts forensic nursing was accepted in our part of the country. With the kind permission of Dr. Ravinder Singh our visionary dean, the nursing students of our local nursing school were taught forensic nursing at Govt. Medical College, Patiala. They started attending theory classes. They were also demonstrated postmortem examination, examination of injured persons as well as who were sexually assaulted. They were also demonstrated cases of poisoning. In all these cases special stress was laid on collection of samples, their preservation, packing and dispatch to the forensic science laboratory.

This thing continued at slow speed and then in 2003 an attempt was made at national level at Patna at the time of International congress of Forensic Medicine and Toxicology and XXIV Annual Conference of Forensic Medicine to popularize it by showing everybody the success which we had got in our state. Again an attempt was made during the ICFMT-2003 conference, New Delhi where invited lecture was delivered on forensic nursing to make the forensic fraternity aware about the movement of forensic nursing in India.

This aroused a great interest throughout India and we had many queries from different parts of the country which were suitably answered. As a result of this forensic nursing also started in AIIMS, New Delhi and some other places in India.

In the meantime Journal of Punjab Academy of Forensic Medicine and Toxicology also incorporated forensic nursing as one of the thrust areas. Two articles on forensic nursing were published in them. Later on these articles were online also as the journal became available online. Progress of forensic nursing was appreciated internationally by the publication of one article on forensic nursing "Bringing Hope to India" in the official publication of International Association of Forensic Nursing.

Now India is on the world map of forensic nursing. Dr.T.D. Dogra, Dr. Anil Aggarwal and I are the members of the global advisory panel of journal of forensic nursing being published from USA along with people from different parts of the world.

At the 4th annual conference of Punjab Academy of Forensic Medicine and Toxicology a concerted effort was made by dean of Govt. Medical College Dr. Kiranjeet Kaur to get it introduced in the syllabus of the B.Sc. Nursing by Baba Farid University of Health Sciences. At the same conference Vice chancellor of Baba Farid University of Health Sciences agreed in Principle to get it introduced in the syllabus of undergraduate nursing students. For this a project report was submitted to the university and was put in the faculty meeting of the university. We are hopeful that it will be introduced in the syllabus of the university shortly.

We had meetings with the higher police officials and with the attorneys regularly along with the district attorney so that there will not be any problem while implementing forensic nursing in the field

It was analyzed that why we had the slow progress as we started with the nursing students without any awareness being done for nursing faculty. This time awareness program of nursing faculty of local nursing college was carried out and we found there was greater acceptance of forensic nursing by students and teachers.

We had visiting scholars from the USA which also participated in these awareness programs. Cris Finn and Virginia Lynch helped in these awareness programs by telling them the importance and success stories of forensic nursing in the USA. It helped a lot in motivating nurses to join this stream.

Now we have a regular batch of nursing students attending the mortuary and emergency office of the forensic medicine and we hope this will become possible in other medical colleges and institutions.

We had the advantage that visiting scholars Jamie Ferrell Instructor of Clinical Nursing National Forensic Nursing Institute University of Rochester and Renae Diegel, Forensic Nurse Examiner/Program Director conducted the workshop on Rape victim Examination in the year 2006 and this also motivated people to accept the growing influence of forensic nursing in India

Continuing with this success story Baba Farid University of Health Sciences is going to hold another awareness program for the entire nursing faculty and police officers of the Punjab in the last week of February 2006.

If we take the success story of Punjab in introducing and developing forensic nursing in the state it can be role model for the development of forensic nursing anywhere in the world.

Prof. R.K. Gorea

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TOXIC EFFECTS OF EMBALMING FLUID ON MEDICAL STUDENTS AND PROFESSIONALS

Dr. Daksha Dixit, Lecturer, Anatomy,

Dr. P. D. Athavia, Professor & Head, Anatomy,

Dr. H. M. Pathak, Professor & Head, Forensic Medicine & Toxicology,

Lokmanya Tilak Municipal Medical College, Sion, Mumbai, INDIA

ABSTRACT

Vapours of embalming fluid in the dissection room are a perennial cause of irritation to the mucous membranes of the pharynx, upper respiratory tract and eyes. We made an attempt to assess the discomfort level produced by formalin and that produced by the standardized embalming fluid used in our department.

A list of twenty symptoms was made and circulated among students attending dissection and students were asked to grade the severity of each symptom experienced on a scale of 1 to 4. Individual scores of each symptom were statistically compared and summated, and the same reflected the general acceptability of the embalming fluid.

Key Words : Embalming fluid, Formalin, Students, Symptoms.

INTRODUCTION

Preservation of cadavers is normally achieved through the process of embalming, in which, a fixative is introduced into body tissues, in such a way as to maintain, as far as possible, a life-like state, and in the process, retaining the relationships of human anatomy as are required for dissection purposes. The fundamental properties of an embalming chemical should be: 1) to ensure that there is no risk or fear of infection on contact with the dead body, 2) to produce, without mutilation, a natural colour and effect on the body, 3) to ensure preservation of the body and prevention of putrefaction changes and disturbances, which so often results in odious purging and discharge from various orifices of the body, and 4) to prevent contamination with insects and maggots.

The embalming fluid consists of a group of chemicals that include preservatives, germicides, buffers, wetting agents, anticoagulants, dyes, perfuming agents, etc. These groups are combined in various proportions to produce the embalming fluid.

Formalin, a commercial source of formaldehyde, is the chemical most used for this purpose. Formaldehyde (HCHO) was discovered in 1856 by the British chemist, August Wilheld Von Hofmann. It is a noxious, flammable gas, extremely soluble in water. It is colourless at ordinary temperature and has an irritating pungent odour. It is commercially available as formalin containing 37% by weight or 40% by volume of formaldehyde gas in water. Formalin contains an average 7% of methyl alcohol, 37% formaldehyde and the remaining is water. It rapidly metabolizes to formic acid. It is widely used in the chemical, adhesive, paint, plastic, construction, textile, paper and cosmetic industries [1]. The concentration of formaldehyde is usually expressed in terms of parts per million (1 ppm = 1.248 mg/cu.m.)

Formaldehyde is the commonest preservative used for embalming. Anatomists, technicians in histology and embalming laboratories, as well as medical students during their dissection course, are all exposed to formaldehyde, which in many situations, crosses the threshold for irritation of eyes and upper respiratory tract. Prior to the Control of Substances Hazardous to Health Act (1990) there were a variety of formaldehyde-based formulae used for embalming fluids in Medical Schools in the UK [2]. In the US, the permissible limits of occupational exposure to formaldehyde are 3 ppm in a time-weight average breathing zone during an 8-hour period, a ceiling concentration of 5 ppm and an acceptable maximum peak of 10 ppm for no longer than 30 minutes during a one day shift [1].

The toxic effects of exposure to formaldehyde can be classified as irritation of mucous membrane, contact dermatitis and mutagenicity or carcinogenicity. Formaldehyde has also been documented for initiating an allergic reaction [3].

The increased formaldehyde fumes in the dissection rooms and embalming rooms are due to: 1) poor working practices leading to spillages of fluid during embalming, 2) poor condition of cadavers causing embalming fluid to leak out of the cadaver, 3) using high concentrations of formaldehyde in the embalming fluid, and 4) poor ventilation of dissection rooms.

MATERIALS AND METHODS

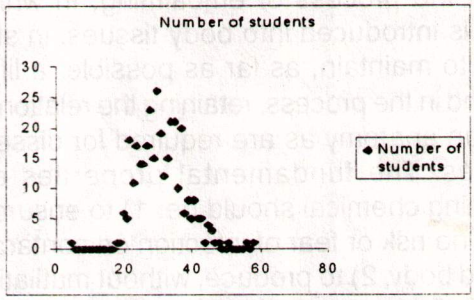
In our study, we evaluated the various toxic effects of the embalming fluid on the medical students and the medical professionals who are exposed to the formaldehyde fumes during the course of their dissection schedule. We framed a questionnaire containing 20 symptoms that were arising due to inhalation of formaldehyde fumes. These were circulated amongst the students and medical professionals of four different medical colleges in Mumbai. The symptoms that were evaluated were: unpleasant smell, dry or sore nose, running or congested nose, unusual thirst, itching in the eyes, redness of eyes, excessive lacrimation, disturbance of sight, nausea, headache, syncope (fainting episode), unusual tiredness or dizziness, dry or sore throat, gastrointestinal disturbances, itching of the hands, skin eruptions on the face or neck, respiratory distress and disturbed nocturnal sleep. All these symptoms were graded on a scale of 1 to 4 as follows: grade1 - not at all, not recognizable, grade 2 - barely recognizable, grade 3 - strong, prominent and irritating, and grade 4 - intolerable. They were also asked to report the frequency of use of gloves during the dissection and the history of occurrence of any kind of allergy in the past.

In all the four medical colleges, the embalming fluid that was used contained formaldehyde as the chief preservative chemical. The students were exposed to the formaldehyde fumes for not more than 6 hours during a one-day dissection schedule. The medical students and professionals filled and returned a total of 338 questionnaires. These grades were then edited on a master chart, and total and average grades for each symptom were calculated and the graphs were plotted.

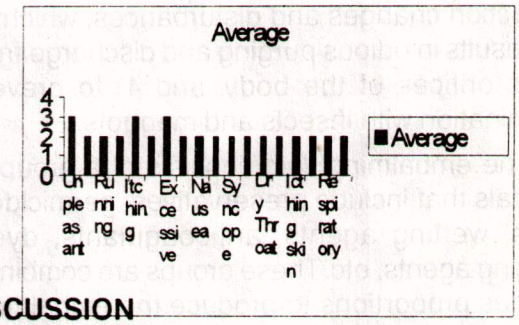
OBSERVATIONS

The total score of all the 20 symptoms ranged from 5 to 58. As is seen in graph 1, which shows the total scores plotted on the x-scale versus the number of cases having that total grade on the y-scale. This graph shows a peak of 26 cases having a total of 33 and the range extending from 5 to 58. The average grades were between 2 and 3. Out of the total of 338 cases 234 students were using gloves while dissection. This comes to about 69.2% and there were 9 students that were having a past history of allergy, making it 2.66%. Graph 2 shows the remaining 18 symptoms, plotted on the x-scale vis-à-vis the average grade for each symptom on the y-scale. This graph clearly shows that the three most disturbing symptoms were: 1) unpleasant smell, 2) itching of the eyes, and 3) excessive lacrimation.

Graph 1: Total score Vs the number of cases



Graph 2: Symptoms Vs Average score



DISCUSSION

The toxic effects of the formaldehyde are due to the formalin fumes that arise in the dissecting and embalming rooms. Decreasing the concentration of formaldehyde in the embalming fluid can reduce the formaldehyde fumes. An embalming fluid measuring 8 litres is used for one

normal built adult cadaver. This embalming fluid is a combination of formaldehyde, spirit (methyl alcohol), distilled water, carbolic acid (phenol), glycerine, turpentine, sodium borate and eosine). A good ventilation system in these rooms will reduce the formaldehyde concentrations by almost half. This can be achieved by installation of negative pressure pump systems. Further, the use of mask also helps in combating the unpleasant smell. As for the irritant effects of formaldehyde on the eyes leading to itching and excessive lacrimation, the use of an eye washing station in the dissection room would help in reducing these irritant effects. Nowadays there is a legal requirement for the use of formaldehyde in embalming fluids in the United States of America [4].

As for the other alternative chemicals in place of formaldehyde, Frolich et al in 1984 had tried using phenoxyethanol as its non-toxic substitute. It proved to be impractical as the amount required was large i.e. about 600 litres for each cadaver, needing continuous immersion to prevent mould formation and the fixation process taking 5 to 10 months [5]. Glutaraldehyde is an aldehyde related to formaldehyde, with similar fixation qualities. It would be a feasible alternative, but because of the volumes that would be required, it is prohibitively expensive.

A similar study on "formaldehyde vapour emission in embalming rooms" by Edward J Kerfoot clearly demonstrated that formaldehyde is mainly an upper respiratory irritant, causing eye and nose burns, sneezing, coughing and headache [6]. Despite of its toxic effects formaldehyde remains the popular choice as a tissue fixative because of its undoubted efficiency and the consistency of results that are obtained. A reduction in proportion of formaldehyde in the embalming fluid resulted in vapour levels that were within the limits set by the US Government, i.e. 1 ppm or less over an 8-hour period or no more than 2 ppm over a 15-minute period. Also, reduction in formaldehyde concentration is not deleterious to specimen preservation, but leads to a safer working environment as is quoted by B.S. Mitchell. In 1980 Walrath et al presented a study on the "Carcinogenic effects of formaldehyde on embalmers" at the CIIT Conference, New York, wherein they concluded that embalmers showed a slightly elevated mortality from cancer, a significant excess of arteriosclerotic heart disease and a low incidence of pneumonia deaths. The sites at special risk for cancer were skin, nasal passages, buccal cavity, pharynx and larynx [7].

CONCLUSION

The toxic effects of the formaldehyde fumes during dissection and embalming can be reduced by the following measures: 1) use of embalming fluid with a lesser concentration of formaldehyde. 2) good exhaust ventilation systems, 3) installation of eye washing stations and negative pressure pump systems, 4) use of gloves, apron and mask to avoid direct skin contact, 5) avoid working between exhaust vent and the sources of formaldehyde fumes, and 6) avoid spillage of embalming fluid.

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A COMPREHENSIVE STUDY ON EPIDEMIOLOGY OF MEDICO-LEGAL CASES

E.Ravi Kiran, Associate Professor,
K.Vijaya, Associate Professor,
Department of Community Medicine, KIMS, Sreepuram, AP.

ABSTRACT

A study was carried out in a district hospital to find out the epidemiology of medico-legal cases referred to it. 465 medico-legal cases were analyzed to draw valid conclusions. Age and sex distribution, time of occurrence, time elapsed between and expiry of different types of cases were the parameters studied.

Keywords: Medico-legal cases, Road Traffic Accidents (RTA), Assault, Burns, Poisoning and Drowning.

INTRODUCTION

With the burgeoning population, increased levels of un-employment, high income disparities, substance abuse, increased vehicular traffic density, meagre infrastructure facilities, coupled with various types of morbidities the number of medico-legal cases is on the increase. This assumes immense importance for those who are concerned with law and order, those who treat them and those who are bothered with the etiology, manner of causation and their documentation. Likewise if will be in the interest of a preventive medicine specialist to explore the cause, pattern, time, place and person relationship with the event and dole out a hypothesis of a risk factor and an outcome phenomenon.

MATERIALS AND METHODS

This prospective study was carried out at the Government Wenlock District Hospital, Mangalore, Karnataka from January 2002-December 2002. All the medico-legal cases referred to the casualty of this district hospital were recorded by the investigator in a scientific proforma pre-validated by Depts. of Forensic Medicine and Community medicine. Around 465 medico-legal cases were collected, and the data was analyzed and interpreted for further action.

OBSERVATIONS

It was observed in the study that the maximum number 89 (19.1%) of medico-legal cases were in the age group of 25-30 years and the least number 4 (0.9%) were in the age group of 5-10 years. Under 5 children constituted 9 (1.9%) in number. 33 (7.1%) cases were seen in above 55 years age group. Males, 364 (78.3%) outnumbered the females,101 (21.7%) in the sex-wise distribution of the cases. Maximum number 66 (18.1%) of males and females 23 (22.7%) was also an interesting observation in the age group of 25-30 years. Least number of males 3(0.8%) and females 1(0.9%) were seen in the age group of 5-10 years.

Table1

Distribution of medico-legal cases age and sex wise

Age in years	Male	Female	Total (%)
0-5	7	2	9(1.9)
5-10	3	2	4(0.9)
10-15	14	6	20(4.3)
15-20	25	13	38(8.2)
20-25	44	15	59(12.7)
25-30	66	23	89(19.1)
30-35	41	12	53(11.4)
35-40	50	7	57(12.3)
40-45	36	4	40(8.6)
45-50	28	12	40(8.6)
50-55	19	4	23(4.9)
>55	31	2	33(7.1)
Total No.(%)	364 (78.3)	101(21.7)	465(100)

Road traffic accidents (RTA) constituted the maximum 161 (34.6%) of medico-legal cases, followed by Assault 144 (30.9%), Poisoning 104 (22.4%), Burns 52 (11.2%) and Drowning 4

(0.9%).In all the types of medico-legal cases, males were more affected than females except in burning where it is otherwise.

Table2

Distribution of Medico-legal case s according to type and sex

Medico- Legal cases		Male	Female	Total (%)
RTA	138	23	161(34.6)	
Assault	121	23	144(30.9)	
Burns	20	32	52(11.2)	
Poisoning	81	23	104(22.4)	
Drowning	4	0	4(0.9)	
Total (%)	364 (78.2)		101(21.7)	465(100)

Of the 456 (100%) medico-legal cases, the maximum 125 (26.8%)occurred between 6am-12 noon, followed by 113 (24.3%) cases between 7pm-12am, 85 (18.3%) cases between 12noon-4pm, 84(18.1%) cases between 4pm-7pm, 58 (12.5%) cases between 12am-6am. Maximum, 45 (27.9%) RTA cases out of 161(100%) cases occurred during 6am-12 noon. Maximum, 47(32.6%) Assault cases out of total 144(100%) occurred during 7pm-12am. Similarly it was observed in burns cases that the maximum 19 (36.5%) happened between 7pm-12am out of total 52 (100%) cases. Poisoning cases topped 32 (30.8%) during the time between 6am-12 noon out of total 104 (100%) cases. Out of 4 (100%) drowning cases, maximum 2 (50%) took place between 12 noon-4pm.

Only 48 (10.3%) medico-legal cases were referred within 0-1 hours of recurrence to the hospital while 22 (4.7%) cases were referred after 48 hrs of occurrence out of total 465 (100%) cases. Highest number 79 (16.9%) cases were observed to be referred to the hospital in 1-2 hours of

Table3

Distribution of medico-legal cases as per the time of occurrence

Time occurrence	RTA	Assault	Burns	Poisoning	Drowning	Total (%)
12am-6am	21	26	3	8	0	58(12.5)
6am-12noon	45	32	15	32	1	125(26.8)
12noon-4pm	37	18	9	19	2	85(18.3)
4pm-7pm	33	21	6	23	1	84(18.1)
7pm-12am	25	47	19	22	0	113(24.3)
Total(%)	161(34.16)	144(30.9)	52(11.2)	104(22.4)	4(0.9)	465(100)

Table 4

Distribution of medico-legal cases as per time interval between occurrence and arrival to the Hospital

Time Interval (hrs)	RTA	Assault	Burns	Poisoning	Drowning	Total (%)
0-1	21	14	6	7	0	48(10.3)
1-2	29	23	7	19	1	79(16.9)
2-3	22	20	8	17	0	67(14.4)
3-4	24	16	5	16	2	63(13.6)
4-5	14	16	6	10	0	46(9.9)
5-6	6	9	9	7	1	32(6.9)
6-12	16	12	3	19	0	50(10.8)
12-24	11	5	4	1	0	21(4.5)
24-48	10	19	2	6	0	37(7.9)
>48	8	10	2	2	0	22(4.7)
Total(%)	161(34.6)	144(30.9)	52(11.2)	104(22.4)	4(0.9)	465(100)

occurrence and the least number 21(4.5%) cases within 12-24 hours of occurrence. Maximum number 29 (18.0%) of RTA cases out of total 161(100%) were referred within 1-2 hours of occurrence to the hospital. Similar observation was made in Assault cases where the maximum number 23 (15.9%) were found to come within 1-2 hours of occurrence out of total 144(100%) cases. Most of the Burns 9 (17.3%) cases were referred within 5-6 hours of happening, out of total 52 (100%) cases. As far as Poisoning cases are concerned maximum 19 (18.2%) were referred in 1-2 hours and 6-12 hours of occurrence, out of total 104 (100%) cases. 2 (50%) were referred within 3-4 hours of occurrence.

Out of total 465 (100%) cases, only 157 (33.8) cases received First Aid. Out of 157 (100%) cases, 49 (31.2%) RTA cases, 40 (25.5%) Assault cases 16 (10.2%) Burning cases, 49 (31.2%) Poisoning cases and 3 (1.9%) Drowning cases got First-Aid.

It was observed that 82 (17.6%), out of total 465 (100%) cases had evidence of alcohol consumption. Among these 82 (100%) cases, RTA cases constituted 21 (25.6%), Assault 38 (46.3%), Burns 3 (3.7%), Poisoning 19 (23.2%) and drowning 1(1.2%) case. (Table: 6)

Out of 465 (100%) cases 393 (84.5%) recovered and 72 (15.5%) died. Out of 393 (100%) cases who recovered, RTA constituted 143 (36.4%), Assault 130 (33.1%), Burns 21(5.3%), Poisoning 95 (24.2%) and Drowning 4 (1.0%). (Table :7)

Out of total 161 (100%) RTA cases 138 (85.7%) were males and 23 (14.3%) were females. Maximum number, 41(25.5%) of RTA cases were found in the age group of 20-30 years, followed by cases in the age group of 30-40 years which constituted 35 (21.7%). Least number 2 (1.2%) cases were in the age group of 70-80 years. (Table:8) 97 (60.2%) were pedestrians, 38 (23.6%)

Table5

Distribution of medico-legal cases receiving First Aid

First Aid	RTA(%)	Assault(%)	Burns(%)	Poisoning(%)	Drowning(%)	Total (%)
Yes	49(30.4)	40(27.8)	16(30.8)	49(47.1)	3(75)	157(33.8)
No	112(69.9)	104(72.2)	36(692)	55(52.9)	1(25)	308(66.2)
Total (%)	161(100)	144(100)	52(100)	104(100)	4(100)	465(100)

Table6

Distribution of medico-legal cases as per evidence of alcohol consumption

Evidence of alcohol	RTA(%)	Assault(%)	Burns(%)	Poisoning(%)	Drowning(%)	Total (%)
Present	21(13.0)	38(26.4)	3(5.8)	19(18.3)	1(25)	82(17.6)
Absent	140(87.0)	106(73.6)	49(94.2)	85(81.7)	3(75)	383(82.4)
Total (%)	161(100)	144(100)	52(100)	104(100)	4(100)	465(100)

Table7

Distribution of medico-legal cases who have recovered or expired

Condition of Medico legal cases	RTA	Assault	Burns	Poisoning	Drowning	Total
Recovered	143(88.8)	130(90.3)	21(40.4)	95(91.3)	4(100)	393(84.5)
Expired	18(11.2)	14(9.7)	31(59.6)	9(8.7)	0(0)	72(15.5)
Total (%)	161(100)	144(100)	52(100)	104(100)	4(100)	465(100)

Table8

Distribution of RTA cases Age & sex wise

Age group in yrs	Male	Female	Total (%)
0-10	4	1	5(3.1)
10-20	16	3	19(11.8)
20-30	37	4	41(25.5)
30-40	31	4	35(21.7)
40-50	24	8	32(19.9)
50-60-	16	2	18(11.2)
60-70	8	1	9(5.6)
70-80	2	0	2(1.2)
Total (%)	138(85.7)	23(14.3)	161(100)

Table9

Distribution of types of victims in RTA

RTA victims	Male(%)	Female(%)	Total(%)
Pedestrian	80(57.9)	17(73.9)	97(60.2)
Two wheelers	36(26.1)	2(8.7)	38(23.6)
Four Wheelers	22(016.0)	4(17.4)	26(16.2)
Total (%)	138(100)	23(100)	161(100)

Table 10

Distribution of medico-legal cases as per type of injuries sustained in RTA

Type of injury	Male (%)	Female (%)	Total (%)
Upper limb	9(6.5)	3(13.0)	12(7.5)
Lower limb	36(26.1)	6(26.1)	42(26.1)
Abdominal	70(50.7)	9(39.1)	79(49.0)
Multiple	23(60.7)	5(21.7)	28(17.4)
Total	138(100)	23(100)	161(100)

Table11

Distribution of RTA as per seasonal variation

Season	No (%)
Winter	54(33.5)
Summer	29(18.0)
Rainy	78(48.5)
Total	161(100)

Table12

Distribution of assault cases as per type of weapon used

Type of weapon	Male	Female	Total(%)
Blunt	73	13	86(59.7)
Sharp	45	10	55(38.2)
Firearms	3	0	3(2.1)
Total (%)	121(84)	23(16)	144(100)

Table13

Distribution of assault cases as per type of injury

Type of injury	Male (%)	Female (%)	Total (%)
Simple	48(39.7)	9(39.1)	57(39.6)
Grievous	73(60.3)	14(60.9)	87(60.4)
Total (%)	121(100)	23(100)	144(100)

Table14

Distribution of burn cases as per percentage

% of burns	Male	Female	Total (%)
0-25	6	4	10(19.2)
25-50	7	8	15(28.9)
50-75	3	11	14(26.9)
75-100	4	9	13(25.0)
Total (%)	20(38.5)	32(61.5)	52(100)

Table15

Distribution of burn cases as per degree

Degree of burns	Male (%)	Females (%)	Total (%)
Superficial	13(65)	10(31.3)	23(44.2)
Superficial to deep	5(25)	13(40.6)	18(34.6)
Deep	2(10)	9(28.1)	11(21.2)
Total (%)	20(100)	32(100)	52(100)

Table16

Distribution of burn cases as per recovery or death

Burns case status	Attempt	Number (%)
Recovered	Suicide	7(13.5)
	Homicide	0(0)
	Accident	14(26.9)
Expiry	Suicide	4(7.7)
	Homicide	0(0)
	Accident	27(51.9)
Total		52(100)

Table17

Distribution of drowning medico-legal cases as per places

Site of drowning	No (%)
Well	1(25)
River	0(0)
Sea	3(75)
Others	0(0)
Total (%)	4(100)

Table18

Dzistribution of medico-legal cases as per poisoning

Poison type	Male	Female	Total(%)
Organophosphorus	37	6	43(41.4)
Alcohol	6	0	6(5.8)
Food	12	0	12(11.5)
Snake bite	6	0	6(5.8)
Kerosene	5	3	8(7.7)
Sedative	0	5	5(4.8)
Plant	2	1	3(2.9)
Corrosive	3	1	4(3.8)
Others	10	7	17(16.3)
Total (%)	81(77.9)	23(22.1)	104(100)

Table19

Distribution of medico-legal cases poisoning as per recovery or death

Poisoning cases status	Attempt	No (%)
Recovered	Suicide	49(47.1)
	Homicide	42(40.4)
	Accident	4(3.8)
Expiry	Suicide	9(8.7)
	Total (%)	104(100)

were riding two wheelers and 26 (16.2%) were riding four wheelers among the total 161 (100%) RTA victims.(Table:9)

On observation of injuries in RTA victims maximum 79 (49%) had injuries on abdomen followed by those on lower limb 42 (26.1%), followed by those who had multiple injuries 28(17.4%) and the least 12 (7.5%) had on upper limb. (Table :10)

Most of the RTA cases were during the rainy season, 78 (48.5%), followed by those in winter 54 (33.5%) and the least 29 (18%) during summer season. (Table :11)

Among the 144 (100) Assault cases, 121 (84%) were male and 23 (16%) were female.86 cases(59.7%) were caused by weapons of blunt nature, 55 (38.2%) cases were caused by sharp weapons and 3 (2.1%) cases were caused by use of firearms. (Table:12)

Of the total 144 (100%) Assault cases 57 (39.6%) cases were categorized as "Simple" and the rest 87 (60.4%) cases were categorized as "Grievous" (Table: 13)

Out of total 52(100%) burns cases, 20 (38.5%) were males and 32 (61.5%) were females. 10 (19.2%) of the cases had 0-25% burns, 15(28.9%) had 25-30% burns, 14(26.9%) had 50-75% burns and 13(25.0%) had 75-100% burns. (Table:14) 23 (44.2%) had superficial burns, 18 (34.6%) had superficial to deep and 11(21.2%) had deep burns of the total 52 (100%) burns cases . (Table:15) 21 (40.4%) burn cases of the total 52 (100%) burns cases recovered and 31(59.6%) succumbed to it. 7 (33.3%) had attempted suicide and 14(66.7%) were due to accidents while there was no 0(0%) case of homicidal attempt among

the 21(100%) cases which recovered. Out of total 31(100%) who expired about 4 (12.9%) were of suicide, 27 (87.1%) were due to accidents while there was no 0 (0%) case of homicide. (Table:16) Among the 4 (100%) cases of drowning studied , 1 (25%) was in a well and 3 (75%) were in the sea. There were no other sites involved in these cases. (Table:17). 104 (100%) medico-legal cases were due to poisons out of which 23 (22.1%) were females and 81(77.9%) were males. Maximum 43 (41.4%) were due to Organo-phosphorus and minimum 3 (2.9%) were due to plant source of poisoning. Snake poisoning constituted 6 (5.8%), kerosene constituted 8 (7.7%) and alcohol 6 (5.8%) of the total cases. (Table:18)

95 (91.3%) cases out of total 104 (100%) poisoning cases recovered, while the rest 9 (8.7%) expired. Of the 95 (100%) cases recovered, 49 (51.6%) made a suicidal attempt, 42 (44.2%) were involved in homicidal attempt and 4(4.2%) were of accidental cases. (Table:19)

DISCUSSION

In a prospective hospital based study of 160 cases by Kochar A et al [1] at the casuality of RML Hospital and Smt. S.K. Hospital at New Delhi it was found that the maximum number 151 (94.4%) of RTA cases occurred in males compared to females, 9(5.6%).Maximum number 46(28.8%) of RTA cases occurred in the age group of 31-40 years and the least number 1 (0.6%) occurred in the age group of >70 years Maximum number, 56 (35%) cases occurred in the time between 8pm -11.59pm and the least 4 (2.5%) between 4am -7.59am. Evidence of alcohol in the blood was found in all the cases registered in the casualty. Similar observations have been found in our study of 160 cases of RTA where the maximum number 138 (85.7%) of cases were recorded in males compared to females 23 (14.3%). Age wise distribution of RTA cases reveals that the maximum cases 41(25.5%) were in the age group of 20-30 years in contrast to the study by Kochar A et al.1 However minimum, 2 (1.2%) cases were found in the age group of>70 years which is similar to the earlier study1. Maximum number 45 (27.9%) occurred between 6am-12noon and least number 21 (13.04) occurred between 12am-6am while differ from our observations.

Evidence of alcohol was seen only in 21 (31%) of total no.161 (100%) cases in our study which also differs from the observation by Kochar etiological relation between alcohol use and causation of vehicular crashes both fatal and non-fatal is well established [2].

In a study on RTA by Goutam B et al [3] it was found that the age of victims varied from minimum of 6 years to a maximum of 80 years with mean age of 33 + 15.87 years. Maximum of victims, 37.3% were found in the age group of 21-30 years. Most of the victims are males. This study compares favorably with the observations made in our study.

Maximum number 78 (48.5%) cases of RTA were seen in the rainy season and least, 29 (18%) in summer season in our study which is in contrast to the study made by Goutam B et al3 in his study where maximum number of cases 36 (32.7%) occurred in summer with least 22 (20%) in the rainy season.

In our study maximum number cases 161(34.6%) out of total 465 (100%) medico-legal cases were RTA.. Similarly in a study [4] conducted at GTB Hospital in Delhi for a period of 2 months to compare RTA with other cases of trauma, there were 122 RTA cases out of total 400 patients which shows its predominance.

In a study conducted by Taruni et al [9] on profile of poisoning cases admitted in RIMS Hospital, Imphal it was found that in the sex-wise distribution the number of female cases 175 (50.29%) outnumbered the males, 173 (49.71%). This is in contrast to our study where the number of male poisoning cases 81(77.9%) were more than female poisoning cases, 23 (22.1%). Similar observation as per our study were also made by the authors in other parts of the country [6-10].

Organo-phosphorus poisoning was reported to be maximum number, 43 (41.4%) cases in our study. Our observations are supported by other authors [11-12].

Mortality observed in our study was 9 (8.7%) out of total number, 104 (100%) poisoning cases . About 40.4% were case of homicide, 47.1% cases were of suicide and 3.8% cases were accidental. This is in contrast to the study made by Aggarwal NK and Aggarwal BBL [8] who found that mortality raste due to poisoning was 11.3% Accidental

attempt and suicidal attempt constituted 51% and 49% respectively with no case of suicide.

Scant literature on epidemiological aspects of burns and drowning cases limit our study for a comparative analysis.

CONCLUSION

This present study helps to interpret the types of medico-legal cases presenting at the casualty of the Government hospital. This will provide an insight to the policy makers, law custodians and the community to look into the specific aspects of the cases and then take measures accordingly for the benefit of the community and people at large of this place. Health awareness about stress regulation and control, education creating awareness of the traffic rules and motor vehicle driving legislations, will have to the strengthened and reinforced time and again to bring down the numbers at the casualty.

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ESTIMATION OF STATURE FROM HAND LENGTH

Dr. Sunil, Senior Resident,

Dr. P. C. Dikshit, Director, Professor & Head,

Dr. Anil Aggrawal, Professor,

Department of Forensic Medicine Maulana Azad Medical College, New Delhi-110002

Dr. Mukta Rani, Junior Specialist, L. B.S. Hospital, Delhi.

ABSTRACT

The present study comprised of a sample of 150 healthy individuals (75 males and 75 females) studying in various colleges of Delhi. All the individuals were measured for height and hand length. The data thus obtained have been subjected to statistical computation for deriving the regression equations. Bilateral asymmetry in hand measurements were statistically insignificant. Regression equations were derived for right and left hand separately by which living stature may be fairly accurately estimated when a fragmentary or mutilated portion of upper extremity is recovered. Using the regression formula derived in this study, stature can be estimated within the error of +4.0 to 4.6cm from hand length.

Key words: Stature; Hand length; Regression Equations

INTRODUCTION

Identification of human remains is a crucial problem and is of immense importance to the forensic expert. Among the various parameters of identification, individual's stature is an inherent characteristic, the estimate of which is considered to be important in those cases where only fragmentary or mutilated remains of an unknown person are recovered. The length of certain long bones and appendages of the body represent a certain relationship in the form of proportion to the total stature. The orthodox methods of estimating stature are limited to measuring whole limb bone and correlating living stature and limb bone length. But few studies are reported in which an attempt has been made to estimate stature from fragmentary or mutilated parts of the body.

In the present paper an attempt has been made to derive some regression formulae to indicate relationship between height and hand length in healthy adult individuals in both sexes. No particular ethnic group has been included in the study but combinations of variegated ethnic groups are considered. This information will be highly important to Forensic scientists, human biologists and physical anthropologists for determination of stature from the fragmentary remains of upper limb.

MATERIAL AND METHODS

The present study comprised of 150 (75males; 75 females) healthy individuals studying in various colleges of Delhi between 18-22 years of ages. All the individuals' were right handed. Detailed medical history and clinical examination of the subjects were conducted to rule out any significant disease or deformity that could have affected the general or bony growth.

The subjects were measured for height and hand length. The stature was measured using standard Stadiometer in a standard standing position with head oriented in ear-eye plane from the standing surface to the highest point on the head. The hand length was measured using the Sliding Caliper from the proximal crease of the wrist to the tip of middle finger when the hand was held straight and stretched. To minimize subjective errors all the measurements were taken three times and then mean was taken. The data thus obtained was subjected to statistical calculations using Spss computer programmer to derive linear regression equations.

OBSERVATIONS AND RESULTS

Table 1 indicates that

a) Mean height of the males to be 169.0cm with a standard deviation of +7.8cm

b) Mean hand length of the males of the left side to be 19.5cm with a standard deviation of +1.3cm whereas mean hand length of right side of males has been found to be 19.6cm with standard deviation of +1.3cm.

Table 1

Measurement of height and hand length in males

Measurements	Mean value (cm)	Standard Deviation (+ cm)
Height	169.0	7.8
Hand length (right)	19.6	1.3
Hand length (left)	19.5	1.2

Table 2 indicates that

a) Mean height of females has been found to be 158.0cm with a standard deviation of +5.8cm.

b) Mean hand length of female of left side has been found to be 18.1cm with a standard deviation of +1.0cm whereas the mean hand length of right side was observed to be 18.2cm with a standard deviation of +1.0cm.

Table 2

Measurement of height and hand length in females

Measurements	Mean value (cm)	Standard Deviation (+ cm)
Height	158.0	5.8
Hand length (right)	18.2	1.0
Hand length (left)	18.1	1.0

Table 3 and 4 shows regression equations for hand length of male and female of both sides respectively. Using these regression equations, lines have also been plotted as shown in Fig. 1-4.

Table 3

Regression equations for the estimation of stature from hand length in males

Measurements	Regression equations	Correlation coefficient (r)	Standard error (+ cm)
Hand length (right)	86.93+4.25HLRT	0.7	4.35
Hand length (left)	85.84+4.32HLLT	0.6	4.26

Table 4

Regression equations for the estimation of stature from hand length in females

Measurements	Regression equations	Correlation coefficient (r)	Standard error (+ cm)
Hand length (right)	77.42+4.56HLRT	0.7	4.57
Hand length (left)	80.94+4.40HLLT	0.7	4.63

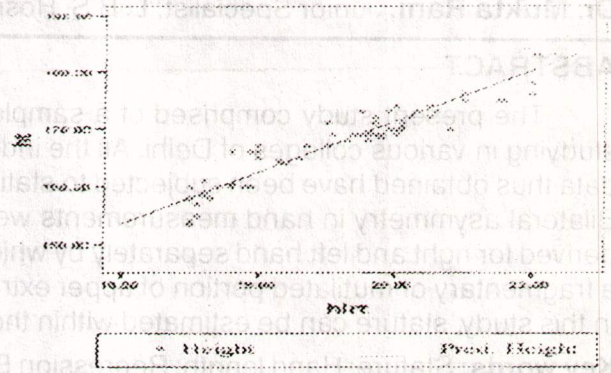

Fig. 1: Regression of height on right hand length for males

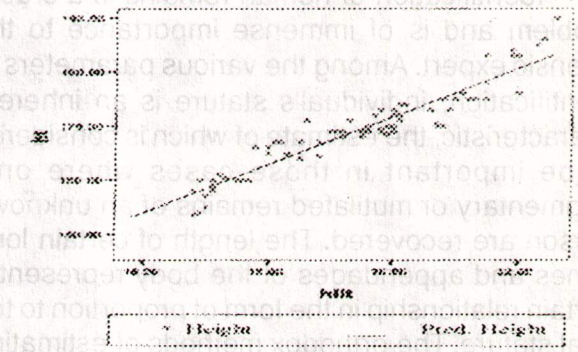

Fig.2: Regression of height on left hand length for males

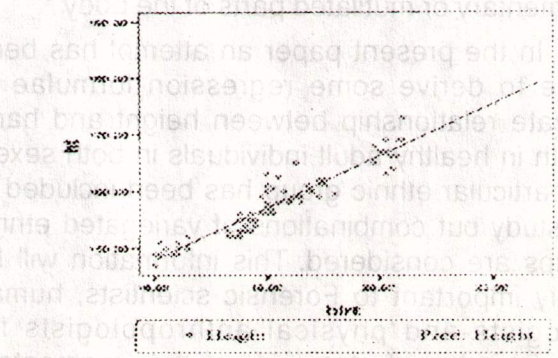

Fig. 3: Regression of height on right hand length for females

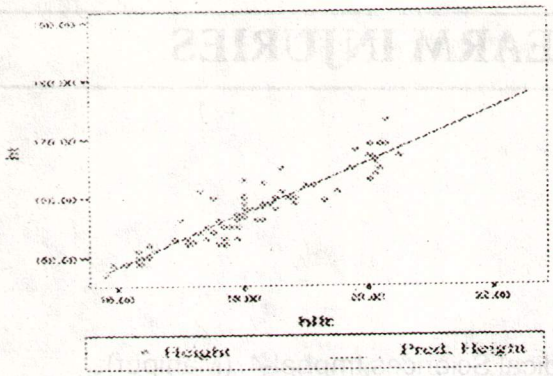

Fig. 4: Regression of height on left hand length for females

DISCUSSION AND CONCLUSIONS

Various researchers [1-6] with variable degree of success have attempted the estimation of stature from various long bones. The difficulty in availability of adequate quantities of bones, in the choice of bones; their cleaning and the need of trained personnel are encountered while correlating bone dimensions with stature. The height was estimated from hand length of 250 Punjabi boys between 17-25 years by deriving regression equations within the error of 3-6 cm [7]. The regression equations were derived from hand length and correlated it with stature among Punjabi males [8]. An attempt was also made to derive regression formulae from hand length among 100 Nigerian adult male medical students of Jos Medical School, Nigeria and the results showed significant correlation between stature and hand length [9]. A study was conducted on 166 subjects and statistically analysed the data indicating a close similarity of relationship between stature and hand measurements and also derived the regression equations [10].

In the present study, a significant correlation of height with hand length has been observed in both the sexes. Measurements of right side were found to be greater than the measurement of the left side, but the difference was marginal and statistically insignificant. By applying the regression equations, the stature can be estimated within error of + 4.35 cm and + 4.26 cm for right and left side respectively in males while in females it is + 4.57cm and + 4.63 cm for right left side respectively as shown in table III and table IV. The formulae devised for determination of stature from hand length would be beneficial for use in an unidentified fragmentary or mutilated part of upper limb especially hand within the standard error of estimate.

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HOMICIDAL FATAL FIREARM INJURIES

Dr. Kh. Pradipkumar, P. G. Student,
Dr. Fremingston K. Marak, P. G. Student,
Dr. Supriya Keisham, P. G. Student,
Dr. M. Phom, P. G. Student,
Dr. A. Momonchand, Prof. & Head
Department of Forensic Medicine, Regional Institute of Medical Sciences,Imphal-4. (Manipur).

ABSTRACT

A retrospective study of homicidal fatal firearm injury cases brought for autopsy in the department of Forensic Medicine, Regional Institute of Medical Sciences, Imphal from Imphal East and Imphal West districts during 1986 to 2003 was carried out. The findings are presented in this paper. 31.62% of the total numbers of the medico-legal autopsies were of homicidal fatal firearm injury. The male victims predominate the female victims i.e. 98% were male. 53.77% of the victims were civilians (28.29% were killed by unknowns, 21.23% by militant & 4.25 by securities). 50.56% were of the age group of 21 to 30 years, followed by the age group of 31 to 40 years (20.51%).

Keywords: Firearm injury, security, militant, AFSPA 1958.

INTRODUCTION

Since Pre-his toric days numerous war took place in between Manipuris and Burmese. The British came to Manipur from Bengal and made the 1st treaty with Manipur on 14th September 1762 and help in administration and fighting against Burmese. In 1890 the British started interfering in the internal affairs of Manipur. Then, the Anglo-Manipuri war had occurred in 1891. On 27th April 1891 the Union Jack was hoisted over Imphal and Manipur lost its independence and sovereignty became under the British paramount. The independence of Manipur from the British rule returned after 56 years, 3 months and 17 days i.e. on 14th August 1947. The Manipur State Constitution Act 1947 was framed. After that, election was held and popular government was formed. On 15th October 1949 Manipur merged with Indian Union.

There was no initiative for any major project, no employment opportunity except those job provided by the State Government, which were limited. Many educated youth became frustrated and joined the ranks of the underground organizations and started the armed propaganda for what was termed as an "Independent Manipur" in the late seventies. Frequent ambushes on the security forces, snatching of arms from the police and other forces; encounters between militant and law enforcing agencies became a routine practice in Manipur.

To restore normalcy in Manipur, the Armed Forces Special Powers Act, 1958 was introduced in five phases. Then, in September 1980 the whole state becomes under the purview of this act. There were three or four underground organizations in 1980 i.e. the year in which AFSPA was introduced in the state. But at present there are 17 or 18 such organizations.

Many prominent leaders, several senior officials, priests, media persons, bus passengers (including women) and students were killed by different underground organizations in the name of reactionaries, agents of the government etc. and also by the security personals in the name of either crossfire or encounter.

To know the common victim of fatal firearm injury, sex and age, range of fire, vital parts involved, signs of torture etc. a retrospective study of deaths due to homicidal firearm injury in two main districts i.e. Imphal East and Imphal West during 1986 to 2003 has been carried out and presented in this paper.

MATERIAL & METHODS

A retrospective study of homicidal fatal firearm injury cases brought from two main districts i.e. Imphal East and Imphal West during 1986 to 2003 (i.e. 18 years) for autopsy to the Department of Forensic Medicine, Regional Institute of Medical Sciences, Imphal has been carried out. The particulars of the victims, history of the incident, postmortem findings were recorded from the postmortem reports and relevant documents. The findings were analyzed.

OBSERVATION

Out of 3947 medico-legal cases brought from these two districts during this period, 1248 (31.62%) were homicidal death due to firearm injury.

Out of those 1248 victims, 35.98% were killed by Militants, 32.13% by Securities and 31.89% by Unknowns. 53.77% of the victims were Civilians of which 28.29% were killed by Unknowns, 21.23% by Militants and 4.25% by Securities (Table No.1).

98% of the victims were male and 50.56% were of the age group 21 to 30 years, which was followed by the age group 31 to 40 (20.51%) and then by 11 to 20 years (16.27%) (Table No.2). 6.25% of the victims had close shot injuries, 4.65% near shots and 89.1% distant shot injuries (Table No.3).

Head was involved in 60.34% of the cases and chest was involved in 24.36% of the cases. Among the victims killed by security, signs of torture were present in 2.99% of the cases; those killed by the militants in 10.25% of the cases, and among the victims killed by the unknowns' signs of torture were present in 11.80% of the cases (Table No.4).

DISCUSSION

From the present study it is revealed that 31.62% of the medico-legal autopsy were homicidal deaths due to firearm injury, which is higher than the findings of Druid H et al (18.75%) [1] and Hougen HP et al (19.3%)[2]. The male preponderance is in agreement with other workers [1-6].

The most common victim were in the age group between 21 - 40 (71.07%) years. The reason for this could be attributed to the fact that this age group is the most active period in an individual's life in terms of their outdoor activity. This incidence of age in the present study is almost in agreement with the findings of Ahluwalia & Gorea (66.65%)[7], Gupta et al (61.75%)[8], Chanana A et al (61.92%)[9], Agnihotri AK et al (52%)[10] and Fatteh et al (45.10%)[11].

In the present series the predominant anatomical site of fatal firearm injury was the head in 60.34% of the cases, which is quite high as compared to the findings according to Karger B et al (47%)[4], Agnihotri AK et al (44.2 %)[10], Makitie I & Pihlajamaki H (42%)[5], Azmak D et al (32.8%)[3] and Chanana A et al (21.83%)[9]. Head was the most common part involved in the study done by Hougen HP et al[2]. In general the concept of the people is that injury ton the head is always fatal. This could be the reason for targeting the head by the assailants in majority of the cases.

In the present study, among the victims killed by security, signs of torture were present in 2.99% of the cases; those killed by the militants in 10.25% of the cases, and among the victims killed by the unknowns' signs of torture were present in 11.80% of the cases.

Table1

Status of the victims

Type of Victim	Number of Victims killed by different type of assailant			
	Security	Militant	Unknown	Total
Civilian	53 (4.25%)	265 (21.23%)	353 (28.29 %)	671 (53.77%)
Militant	335 (26.84%)	15 (1.20%)	0	350 (28.04%)
Security	13 (1.04%)	169 (13.54%)	0	182 (14.58%)
Unknown	0	0	45 (3.61%)	45 (3.61%)
	401 (32.13%)	449 (35.98%)	398 (31.89%)	248 (100%)

Table No. 2

Age & Sex incidence of the victims:

Age group in Years	Number of cases		
	Male	Female	Total
0-10	1	2	3 (0.24%)
11-20	197	6	203 (16.27%)
21-30	621	10	631(50.56%)
31-40	254	2	256 (20.51%)
41-50	93	2	95 (7.61%)
51-60	46	3	49 (3.93%)
61-70	11	0	11 (0.88%)
	1223 (98%)	25 (2%)	1248 (100%)

Table No. 3

Range of fire & type of assailants

Range	By Security	Militant	By Unknown	Total
	(401)	(449)	(398)	(1248)
Close	5	39	34	78 (6.25%)
Near	7	22	29	58 (4.65%)
Distant	389	388	335	1112 (89.10%)
	401(32.13%)	449 (35.98%)	398 (31.89%)	1248 (100%)

Table No. 4

Signs of torture present

Victim	Assailant	Total	Present	Absent
Civilian, Militant, Security	401 Security	12	(2.99%)	389 (97.01%)
Civilian, Militant, Security	449 Militant	46	(10.25%)	403 (89.75%)
Civilian	Unknown	398	47(11.80%)	351 (88.20%)
	Total:	1248	105 (8.41%)	1143 (91.59%)

CONCLUSION

The important medico-legal questions arising in today's scenario of Manipur are the allegation and counter allegation between public and security personnel like arrested & killed vs. killed during encounter. Medico-legal experts are neither for Security nor for Underground Militants. They are for the truth. So, careful and detailed examination by two or more experts under proper Video coverage, detail history from different sources like investigating Officer, victims party, examination of clothing's, whether the wearing are of proper size or not, meticulous examination for any signs of torture, proper collection and preservation of the trace evidences are required.

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MEDICOLEGAL STUDY OF MECHANICAL INJURIES IN CULPABLE HOMICIDES (EXCLUDING DEATHS DUE TO RASH AND NEGLIGENT ACT)

DR SHILEKH MITTAL , Junior Resident,
DR ASHOK CHANANA , Assoc. Professor,
DR HAKUMAT RAI , Professor,
DR. J.S. DALAL , Professor & Head,
Forensic Medicine, GMC, Amritsar.

ABSTRACT

Trend of homicides by different means keeps on changing with the passage of time and development in different parts of the world. A study was conducted on 200 alleged cases of homicides (excluding deaths due to rash and negligent act). Different profiles from demographic and medicolegal aspects were evaluated. The incidence of homicidal deaths was observed as 12.03%, with male preponderant (82.5%) and the commonest age affected was 21 to 40 yrs (51.5%). Rural population was mainly affected. The blunt weapon (50.88%) was commonly used to inflict the injuries and 'abrasion' was the commonest manifestation (32.73%). The defence wounds were present in 36% cases. Head was the main seat of injury (13.65%). The cause of death in most cases was hemorrhage and shock (31.5%), followed by injury to brain (28.5%). Only 16% cases of these received hospital care. This necessitates the prompt medical care to be provided in the 'Golden Hour' to save valuable human life. Police patrolling for early detection of crime and shifting of injured to hospital/critical care center and provision of prompt ambulance service by state/ private hospital/ NGO's for medical care.

Keywords: - Homicide, Mechanical injuries

INTRODUCTION

Homicide or killing of fellow human being by a man, therefore has been a perennial phenomena either in the form of human sacrifices or mass-massacres in wars or killing of a particular individual here and there actuated by personal motive whether offensive or defensive. The incidence of homicide has increased at an alarming rate in our country during the period of 1978 to 1982, homicides constituted from 1.4% to 3.2% of total crime rate[1].

The culpable homicide can be caused by many ways like; violent asphyxia, thermal injuries, mechanical injuries, firearm injuries, poisoning and starvation. The mechanical injuries are caused as a result of the physical violence [2,3].

The incidence of homicide by the use of all kinds of weapons and instruments weather blunt, sharp or firearm has risen substantially and steadily in the society which results that today hardly a day passes in the life of a Forensic Pathologist working in any of the medicolegal postmortem center in the country, when he is not required to face or to do autopsy on the dead body of a victim of homicide[4].

MATERIAL AND METHODS

The study consists of all the cases of homicidal deaths except deaths due to rash and negligent act which were brought to the mortuary complex of the Department of Forensic Medicine and Toxicology of Govt. Medical College, Amritsar, Punjab (India) during the period extending from Ist February 2003 to 20th September 2004.

A total of 200 cases of homicidal deaths were studied to find the demographical, medicolegal aspects of mechanical injuries in culpable homicides.

OBSERVATIONS

Total number of 1662 cases were brought for the post mortem examination from 1.2.2003 till

20.9.2004 out of which 200(12.03%) cases comprised of study group.

TABLE1

AGE AND SEX WISE INCIDENCE AND DISTRIBUTION OF CULPABLE HOMICIDES

Age in Years	Males		Females		Total	
	No.	%	No.	%	No.	%
0-10	6	3%	2	1%	8	4%
11-20	10	5%	6	3%	16	8%
21-30	54	27%	8	4%	62	31%
31-40	33	16.5%	8	4%	41	20.5%
41-50	32	16%	1	0.5%	33	16.5%
51-60	10	5%	2	1%	12	6%
61-70	12	6%	1	0.5%	13	6.5%
>70	8	4%	7	3.5%	15	7.5%
Total	165	82.5%	35	17.5%	200	100%

It is clearly depicted that 54(27%) males i.e. maximum became the victim of culpable homicide were of the age group of 21-30 yrs followed by 33(16.5%) and 32(16%) who belonged to the age group of 31-40 and 41-50 yrs respectively. Similarly maximum 8(4%) females who died due to culpable homicide were from the age group of 21-30 years and 31-40 yrs. Thus maximum 103(51.5%) victims belonged to the age group of 21-40 yrs.

32(16%) cases were hospitalized before succumbing to their injuries whereas 168(84%) cases had not received any hospital care.

TABLE 2

INCIDENCE AND DISTRIBUTION OF KIND OF WEAPON USED TO INFLICT THE INJURIES IN CULPABLE HOMICIDE

Kind of Weapon	No.	%
Blunt	145	50.88
Moderately to heavy sharp cutting	59	20.70
Heavy splitting	10	3.51
Sharp pointed	31	10.88
Blunt pointed	2	0.7
Fire arm		
a) smooth bored weapon	9	3.16
b) Rifled weapon	29	10.17
Total	285	100

285 different weapons used to inflict the injuries on 200 dead bodies of culpable homicides blunt weapon 145(50.88%) leads followed by moderately to heavy sharp cutting weapon 59(20.70%). Smooth bored firearm weapon 9(3.16%) was used and Rifled firearm weapon 29(10.17%) used, sharp-pointed weapon was used in 31(10.88%). Only in 10(3.51%) only heavy splitting weapon and in 2(0.7%) blunt pointed weapon was used.

TABLE 3

INCIDENCE AND DISTRIBUTION OF VARIOUS TYPES OF INJURIES IN CULPABLE HOMICIDES

Type of Injury	No	%
Abrasion	235	32.73
Bruise	142	19.78
Laceration	64	8.91
Incision	128	17.83
Puncture Wounds	63	8.77
Firearm Injuries	86	11.98
Total	718	100

718 different types of injuries, Abrasion 32.73% is leading injury followed by bruise, incision, firearm, laceration and puncture wounds i.e. 19.78%, 17.83%, 11.98%, 8.91% and 8.77% respectively.

The incidence of defence wounds present only in 72(36%) of cases.

Injuries to internal organs for death in 200 cases of culpable homicides, 498 different injuries to the different internal organs or which fractures of various bones were found to be maximum i.e. 84(16.87%) followed by injury to chest cavity 78(15.66%) of which lungs were commonly injured 54(10.84%). The brain was injured in 68(13.65%) and abdominal structures were injured in 63(12.65%) out of which intestine, liver and mesentery were injured in 25(5.02%), 17(3.42%) 13(2.61%) respectively and minimum number of injuries to abdominal viscera were of spleen and kidneys 4(0.8%) each. The neck structure was injured in 57(11.45%).

TABLE 4

INCIDENCE AND DISTRIBUTION OF INJURY TO INTERNAL ORGANS IN CULPABLE HOMICIDES

	Organs	No.	%
Cranial Cavity	Brain	68	13.65
Chest Cavity	Lungs	54	10.84
	Heart	24	4.82
Total	78	15.66	
Abdominal Cavity	Liver	17	3.42
	Spleen	4	0.8
	Kidneys	4	0.8
	Intestine	25	5.02
	Mesentery	13	2.61
Total	63	12.65	
Neck structures	57	11.45	
Fractures	84	16.87	
Others	7	1.41	
Total	498	100	

TABLE 5

INCIDENCE AND DISTRIBUTION OF CAUSE OF DEATHS IN CULPABLE HOMICIDES

Cause of Death	No.	%
Haemorrhage and shock	63	31.5%
Injury to vital organs	30	15%
Injury to brain	57	28.5%
Asphyxia	34	17%
Poison	3	1.5%
Misc.		
a) Septicemia	5	2.5%
b) Shock	2	1%
c) Multiorgan failure	4	2%
d) Exact cause cannot be ascertained	2	1%
Total 100%		200

Maximum 63(31.5%) cases were died due to haemorrhage and shock followed by injury to brain 54(28.5%). Asphyxia was in detected 34(17%) of cases and deaths due to injury to various vital organs were declared in 30(15%) cases. Poison was used for homicide in 3(1.5%) cases.

DISCUSSION

1. In the present study 1662 cases for postmortem examination were received from February 2003 to September 2004 200(12.03%) cases were of deaths due to culpable homicide (except deaths due to rash and negligent act). The incidence was higher than Tonsayonand (1984)[5], Pal et al (1997)[6] i.e. 7.7% and 7.69% respectively. Much less than Dikshit, Dogra and Chandra (1986)[7] 28%, but almost the same as compared to Khanagwal and Paliwal (1991)[8] and Dikshit and Kumar (1997)[9] i.e. 10%, 11.5% respectively.

This variation is due to regional conditions i.e. political, social as well as other law order problems as a result of unemployment, poverty, migratory labour etc.

2. Hospitalized/Non Hospitalized

We can observe the fact regarding the medical care given to the victims as shown in (Table No. III) 84% victims were deprived of medical help, only 16% victims got medical treatment. Similarly Dasgupta and Tripathi (1983)[10] had observed that majority of victims were deprived of hospital aid.

The most prominent reason of the deprivation from medical help could be seriousness of injuries, and quick resulting death the places of incidences, which are mostly in fields, farms or road side. The lack of conveyance, non reporting of matter or not carrying the victim to hospital due to fear of inconvenience caused by police investigation thereafter leave the victim to suffer and majority of them either die on the spot or due to delay, on their way to medical center.

3. Age and Sex Wise Distribution

In the present study maximum 31% victims were of age group of 21-30 yrs though 51.5% victims of age group of 21-40 yrs (Table No. 1).

Dasgupta and Tripathi (1983)[10] reported 45.16% victims of age group of 25-44 yrs. Fimate and Singh (1989)[11] reported 50% of victims of age group of 21-40 yrs. Dikshit and Kumar (1989)[12] reported maximum 41.37% victims of age group of 21-30 yrs. Pal et al (1999)[6] reported 29.24% victims of age group of 21-30 yrs.

Majority have observed that maximum number of victims were of age group of 21-30 yrs. Just like current study this could be attributed to the

fact that this is the most active phase of an individual's life, including out door activities, increased aggression and early losing of temper which leads to increase in crime rate by this age group.

In the present study 82.5% main victims were males (Table No. 1). Similar observations were of Dasgupta and Tripathi (1983)[10] who reported 88.97% victims as males. Tonsay anond (1984)[4] reported male and female ratio 9:1. Dikshit, Dogra, Chandra (1986)[7] reported male to female ratio as 7:1. Khanagwal and Paliwal (1991)[13] maximum were male victims 75.2%. Pal et al (1999)[6] male to female ratio was 3:1.

Sex wise distribution is in unison with other studies. This preponderance could be due to the fact that male member of the family is expected to preserve every financial, honour, moral prestige of the family. Hence any threat to these would make him to reach the extremes of most dreadful act. Secondly, female are less likely to be involved in brawling incidents which are commonly associated with intentional killings or likely to be killed as a matter of jealousy and irrespective to whether they had an emotional or sexual relationship with the offender.[10]

4. Distribution of kind of weapon

Maximum homicides were as a result of injury due to blunt weapon i.e. 50.88% which followed moderate to heavy sharp cutting weapon 20.70% least were smooth bored firearm weapon 3.16%, rifled firearm weapon 10.17% and sharp pointed 10.88% of the weapons used to commit the culpable homicide.

Fimate and Singh (1989)[11] in their study relating to homicide also observed that the blunt weapon was the main weapon of offence to cause fatalities it was 52.6% of the total weapons used. This study is in line with current study.

Dikshit, Chandra and Dogra (1986) [7] also observed the main weapon for homicidal deaths was blunt weapon but they noticed 41.42% deaths due to blunt weapons.

Dikshit and Kumar (1997)[9] in their study had observed, though the commonest mode of homicidal death was blunt weapons but there is decline in the use of blunt weapons as clearly shown from his previous study from 41.42% to 30.81%. But in our present study it was observed that there is no decline in the popularity of blunt weapon for causing homicides in North Western region of India.

The reason for the main use of blunt weapon is due to easily available and not arousal of curiosity in the mind of victim to run or escape the assault.

Firearms especially the smooth bored, they are the least used in the current series only 3.16% deaths attributed to this. It is mainly used for scarring and dispersing the mobs or rivals. Rifled firearm injury contributed to death in 10.17% of cases and injuries were mostly on chest region where as Kangar et al (2002)[14] observed main seat of injury for rifled firearm was head and neck. This is contrast to study of Kangar et al. No specific reason can be drawn out of this variation. It is merely chance representation.

5. Defence wounds

In the present study 36% had received defence wounds as shown in Table No. XIX. Similarly Dikshit, Dogra, Chandra (1986)[4] had found in 28.58% victims received defence wounds. Dikshit and Kumar (1997)[9] had found in 11.17% victims, defence wounds are commonest on the palmar aspects of hands. Gill and Cantanese (2002)[15] found defence wound in 49% of homicides. These are caused while warding off a blow or by some other means. In present study also maximum defence wounds were on palmar aspect of hands and outer aspect of forearm just like study of Dikshit and Kumar (1997).

6. Distribution of injury to various internal organs

In the present study 15.6% were of involvement of chest cavity of which 10.84% lungs and 4.82% heart was injured, followed by head 13.65%. Abdominal cavity 12.65%, neck structures 11.45%. Maximum, cases of internal injury were to brain followed by lungs, intestine, heart and other internal organs and least was to kidneys and healthy spleen.

Dasgupta and Tripathi (1983)[10] in their observation found incidence of internal injuries head and neck in 31.18%, abdomen 26.35% and heart 20.43%. They observed brain as main victim of homicidal assault. This is in line to current study.

Tonsayanond (1984)[5] observed that chest

in 44.87% and brain in 22.01% of victim were injured. Dikshit, Dogra, Chandra (1986)[7] had observed that in 96.9% head is involved in blunt force injury and in stab injury abdomen is the common site, of which the most common was intestinal injury 38.4%, stomach 19.2% liver 17.3%. These studies are not in unison with the current study. Reasons are chance and choice of assailant.

A high frequency of involvement of the head individually as a primary target of attack shows that head is the area of choice for the assailants in a close range attack with any weapon as the assailant knows that it is most vital part of human system which could be easily and most conveniently injured.

7. Causes of deaths in homicidal cases

In the present study maximum victims 31.5% died of shock and haemorrhage followed by 28.5% died due to injury to brain, 17% died due to asphyxia, 15% died due to injury to vital organs.

Similarly Dasgupta and Tripathi (1983)[10] had observed that in 56.72% died due to hemorrhage and shock. Dikshit, Dogra, Chandra (1986)[7] had observed that cause of death in 51.28% victim was shock, 41.42% was coma due to brain injury and 4.28% was asphyxia.

Though there is difference in number of cases, but the sequence of causes of death is similar to study of Dasgupta and Tripathi (1983) i.e. shock and haemorrhage is the main cause of death which out number the other causes.

CONCLUSIONS

Despite of modernization and large number of licensed firearms in the society, the trends of homicide with traditional blunt weapons is still the highest in the North West part of India and so is the injuries inflicted by these weapons. Head injury is the main killer, which warrants more number of neurosurgery centers be set up to save valuable lives. Police patrolling for early detection of crime and shifting of injured to the hospital/critical care center and provision of prompt ambulance service by state/private hospital or NGOs for medical care is another aspect, which may decline mortality due to such crimes.

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AGE ESTIMATION FROM ERUPTION OF PERMANENT TEETH

Dr. Kuldeep Singh, Senior medical Officer, Bassi Pathana
Dr. R.K.Gorea, Professor and Head, Forensic Medicine, GMC, Patiala
Dr.Vipin Bharti, Professor and Head, Periodontology, GDC, Patiala

ABSTRACT

This study was conducted on 578 individuals and eruption of various permanent teeth was noted in age group from 4 years to 25 years. Correlation of sex with the eruption of teeth was also noted and was found statistically that there was no significant difference in this. Eruption of teeth was compared between the two jaws and also the two sides of the jaws.

Key Words: Molars, Age estimation, Teeth.

INTRODUCTION

The estimation of age is an important activity and is commonly carried in medico legal area. Assessment of age is often required while administering justice to an individual involved in civil and criminal litigation. The temporary teeth will guide from six months to thirty-three months while the permanent teeth will help from six years to twenty-five years in age determination. Eruption of teeth is known to be affected by dietary, climatic, racial and geographical variations [1].

The branch of Forensic Medicine, which deals with the examination of teeth, is known as Forensic Odontology In a developing country like India, a large number of people are illiterate and have no knowledge or records of their date of birth which is required by law enforcing agencies in matters like, criminal responsibilities, identification, judicial punishment, consent, rape, criminal abortion, employment, attainment of majority, kidnapping and prostitution [2].

There are two methods of dental age assessment, radio- graphically and by clinically visualization of eruption of teeth. By radiographic methods it is possible to follow the formation of crowns and roots of teeth and their calcification.. In young age, this is possible to some extent by studying the calcification of root, but as the child grows, this is not possible. The clinical method to assess dental age is based on emergence of teeth in the mouth. This method is more suitable since it does not require any special equipment, expertise and is more economical. Tooth formation is the best choice for estimating the age as variations are less as compared to other development factors.

There are charts and tables for the assessment of age during development period, which shows the formation, eruption, and calcification of teeth. For this purpose table of Krenfild and Logan further modified by Kronfild and Schour (1939) is commonly used (Mc Donald and Avery, 1998) which has been accepted standard for many years

Since population of India is very large and its climate are different in hence a cross-sectional study was carried out in Patiala to estimate the eruption time of permanent teeth in the age group of five years to twenty five years

Gonzales et al described that the teeth may give, reliable information as to the age in childhood and youth. The permanent teeth eruption starts at sixth year and by twelve to fourteen years, all the permanent teeth except the third molars or wisdom teeth erupt [3].

Polson described that when a tooth of the first dentition has erupted, the infant is in all probability six to eight months old. An infant, who has completed first dentition, has attained about two years of age. The first permanent molar erupts in boys at the age of 73 to 74 Months where as in girls; it erupts at 70 to 72 months. The central incisors showed a wide range in the time of

eruption, which were 72 to 84 months in boys and 69 to 79 months in girls. The eruption of third molar is variable, and these teeth are prone to impaction. When present, one is more than seventeen years [4].

Smith described the earlier eruption of teeth in the lower jaw than in the upper jaw. Temporary dentition begins at 6-8 months off age by eruption of lower central incisors and is completed at 24 months by eruption of second molars. Permanent dentition begins at 6 years of age by eruption of 1st molar behind the 2nd maxillary temporary teeth and is completed at 17-21 years by eruption of 3rd molar teeth (wisdom teeth). The eruption of wisdom teeth is very variable and is never before seventeen years of age [5].

Grewal described eruption of temporary teeth in children at six months for lower central Incisors, seven months for upper central incisors, upper lateral incisors, seven to nine months for lower lateral incisors, tenth to twelfth month. First molar at one year, canine eighteenth month, second molar twenty fourth month .The appearance of permanent teeth is at seventh to eighth year for central Incisor, eleventh to twelfth year for canine, ninth to tenth year for central premolar, tenth to twelfth year for post premolar, sixth to seventh year for first molar, twelfth year for second molar, third molar at seventeen to twenty five year or any age after this [6].

Billewicz et al studied on 635 West African (Gambian) children with in the range of 4.5 to 14.0 years .They found no difference between eruption ages of homologous permanent teeth on the left and the right side of the same jaw. Teeth erupted in the lower jaw with the exception of 1st and 2nd premolars. The eruption in females was earlier than males. One can estimate the calendar age from permanent dentition with an error of 0.5 years for one to teeth and over one year for twelve teeth or more [7].

Sharma and Mittal studied patterns of secondary tooth eruption in Gujjars in a cross-sectional sample of 483 between 6 to13 years of age. They observed female tooth emergence advancement over males but in the sequence of emergence, there were no sex differences. Emergence time difference between median right and left sides was only 14.29% namely central incisors, mandibular 1st molars, in males and lateral maxillary incisors in females. In general mandibular teeth except premolar tend to emerge earlier than their maxillary counterparts [8].

Ilieva, Veleganova and Belcheva conducted study on 928 children from four to eight years of age in Plovdiv for the eruption of first permanent molars from randomly selected kindergartens and schools and found no statistically significant difference in the eruption age of first permanent molars between the two genders, as well as between the upper and lower jaw. They also found the initial eruption age of first permanent molars is five to six years, the mean age is six to seven years and the latest age is seven to eight years [9].

Aims and Objectives

1. To find out average age from eruption of teeth in general.
2. To find out age separately in both sexes from eruption of teeth.
3. To find out the difference in age of eruption of teeth in upper and lower jaw.

Material and Methods

In this study 578 children of age group 4 years to 25 years were studied for the eruption of permanent teeth. Their teeth were examined visually in good light using probe, spatula and mouth mirror for eruption. The teeth were examined either in good daylight or by using a torch having a very fine focusing of light. A tooth was considered erupted, if it has pierced through gums and unerupted if not present in oral cavity.

Only those cases were considered whose records were available for date of birth from school records, ration cards, horoscope, birth certificates, identity cards, driving licence and immunisation card.

After examination of teeth, statically tables are prepared for mean age, range and S.D. for eruption of each tooth in the upper and lower jaw and also for right and left sides of the same jaw. The statically analysis also done for comparison of both sexes.

OBSERVATIONS

The study was conducted during the period of September 2002 to September 2004 and 578 cases were studied which were taken randomly

from various schools, colleges and OPDs of Dental Hospital and Rajindra Hospital, Patiala.

Table 1

showing distribution of group according to age groups and Sex

Age group	Male	Female	Total no. of cases
4.1- 9 years	81	68	149
9.1-14 years	71	90	161
14.1-19 years	64	59	123
19.1-25 years	74	71	145
Total	290	288	578

Eruption of various permanent teeth were noted in both jaws and and both sides and mean eruption was calculated and is tabulated below.

DISCUSSION

We took 578 random cases from different schools and colleges and OPDs of Rajindra Hospital and Government Dental College Patiala. Out of these 290 were males and 288 were females. We noted eruption of permanent teeth in the various age groups.

In our study we found that first permanent

Table 2

showing eruption of Permanent Teeth in both jaws and sides

Type of Tooth	Jaw	Side	No.of cases	Range	Mean ± S.D.
Central Incisor	UJ	R	28	6.08 – 8.71	7.28 ± 0.54
		L	27	6.08 – 8.71	7.30 ± 0.55
	LJ	R	38	6.08 – 8.71	7.20 ± 0.55
		L	38	6.08 – 8.71	7.20 ± 0.55
Lateral Incisor	UJ	R	32	7.64 – 9.98	8.92 ± 0.56
		L	32	7.64 – 9.98	8.92 ± 0.56
	LJ	R	37	7.64 – 9.98	8.88 ± 0.57
		L	37	7.64 – 9.98	8.88 ± 0.57
Canine	UJ	R	17	10.61– 11.96	11.23 ± 0.35
		L	18	10.61– 11.96	11.26 ± 0.37
	LJ	R	23	10.61– 11.96	11.32 ± 0.44
		L	23	10.61– 11.96	11.32 ± 0.44
PM_1	UJ	R	40	9.38 – 11.20	10.16 ± 0.44
		L	39	9.38 – 11.20	10.17 ± 0.44
	LJ	R	40	9.25 – 11.20	10.14 ± 0.46
		L	40	9.25 – 11.20	10.14 ± 0.46
PM_2	UJ	R	19	10.01 – 11.36	10.69 ± 0.39
		L	19	10.01 – 11.36	10.69 ± 0.39
	LJ	R	19	10.01 – 11.36	10.63 ± 0.37
		L	19	10.01 – 11.36	10.63 ± 0.37
M_1	UJ	R	24	5.81 – 7.91	6.60 ± 0.50
		L	24	5.81 – 7.91	6.60 ± 0.50
	LJ	R	27	5.81 – 7.91	6.58 ± 0.59
		L	27	5.81 – 7.91	6.58 ± 0.59
M_2	UJ	R	212	12.01 – 14.15	13.32 ± 0.60
		L	211	12.01 – 14.14	13.30 ± 0.59
	LJ	R	226	12.01 – 14.14	13.19 ± 0.63
		L	226	12.01 – 14.14	13.19 ± 0.63
M_3	UJ	R	75	17.02 -24.96	21.56 ± 2.28
		L	78	17.00 -24.96	21.39 ± 2.35
	LJ	R	89	17.02 -24.96	21.39 ± 2.35
		L	91	17.00 -24.96	21.29 ± 2.35

molars were first to erupt at the age between 5.81 to 7.91 years in both jaws and on both right and left sides with the mean age of eruption at 6.58 ± 0.59 years in lower jaw and 6.60 ± 0.50 years in upper jaw.

We found next permanent teeth to erupt were central incisors which erupted between 6.08 to 8.71 years in both halves of upper and lower jaws. Next teeth found to erupt was found to be second premolars at the age of 10.01 to 11.36 years in both halves of upper and lower jaws with the mean age of eruption 10.63 ± 0.37 years for the lower jaw and 10.69 ± 0.39 years for the upper jaw. We found that canines erupted at the age between 10.61 to 11.96 years for both halves of the upper and lower jaws with the mean age of eruption 11.32 ± 0.44 years for the lower jaw and 11.26 ± 0.37 years for the left half and 11.23 ± 0.35 years for the right half of upper jaw.

In our study, we found that M2 was next to erupt between 12.01 to 14.15 years for upper jaws and 11.94 to 14.14 years in both halves of lower jaws with the mean age of eruption 13.19± 0.63years for the lower jaw and 13.32 ± 0.60 years for upper jaw.

M3 was the last permanent teeth to erupt and was found to erupt at the age between 17.02 to 24.96 years for both upper and lower with the mean age of eruption 21.29 ± 2.35 years for the left and 21.35 ± 2.28 for the right half of lower jaw while mean age of eruption of left half of upper jaw was 21.39 ± 2.35 years and for right half 21.56 ± 2.28 years.

These finding were similar to the finding of Grewal who in his study found that first permanent teeth to erupt was M1 and erupts at the age between 6 to 7 years, central permanent incisors erupt between 7 to 8 years, lateral incisors in between 8 to 9 years, first premolars between 9 to 10 years, second premolars between 10 to 12 years, canine to erupt at the age between 11 to 12 years, age of eruption of M2 as 12 to 14 years and that third molar erupted mostly between 17 to 25 years [6].

We also studied the co-relation of eruption of teeth with sex of the person. There was also no significant difference in eruption between mandibular and maxillary first molars. These findings were similar to the study done by Illieva et al in 2002 who also found no significant difference in eruption and sex of the person as well as no difference in eruption in two jaws.

In our study, we found mostly the permanent teeth erupted earlier in the females than males and that the eruption teeth was earlier in mandible (lower jaw) than in maxilla (upper jaw). were consistent with the findings of Sharma and Mittal (2001) who also found that eruption is earlier in females and that too in mandible.

Wisdom teeth in females erupted earlier in lower jaw as compared to that in males with mean of eruption in females at 21.27 ± 2.32 years on right side and 21.19 ± 2.38 years on left side of the lower jaw while in males the mean age of eruption was 21.39 ± 2.30 years on the right side and 21.33 ± 2.37 years. These finding were corroborative with the finding of Sharma and Mittal's study. It was seen that third molar erupted later in maxilla than in mandible in both females and males, with mean age of eruption in males at 21.51 ± 2.22 years on right side and 21.38 ± 2.33 years on the left side similarly in females these erupted at the mean age of 21.63 ± 2.41 years on the right side and 21.41 ± 2..42 years on the left side of the maxilla. These earlier eruptions of mandibular teeth from their maxillary counter part were the similar to the results of the study done by Sharma and Mittal in 2001.

SUMMARY AND CONCLUSION

1. First permanent teeth to erupt were first molars at the age between 5.81 to 7.91 years in both the jaws
2. Permanent central incisors erupted between the age of 6.08 to 8.71 years for both halves of upper as well as lower jaw
3. Permanent lateral incisors erupt at the age of 7.64 to 9.98 years in both halves of both jaws.
4. First permanent premolars erupts between 9.28 to 11.2 years with mean age of 10.14 ± 0.46 years
5. Second permanent premolars erupts between 10.01 to 11.36 years for the both halves of upper and lower jaw
6. Next permanent teeth to erupt is canines at the age between 10.61 to 11.96 years for both halves of upper and lower jaw
7. Second permanent molars erupts between

the age of 11.94 to 14.14 years for the both halves of lower jaw and 12.01 to 14.15 years for the right half of upper jaw with the mean 13.32 ± 0.60 years while 12.01 to 14.14 years for left half of the upper jaw with the mean age of eruption 13.30 ± 0.59 year.

8. Third permanent molars erupts between the age of 17.02 to 24.96 years for the right halves of both the jaws with mean of 21.56 ± 2.28 years for the upper and 21.35 ± 2.28 years for the lower jaw. On the left of both the jaws third molars erupt at the age between 17.0 to 24.96 years with the mean 21.39 ± 2.35 years for the upper and 21.29 ± 2.35 years for the lower jaw.

9. Eruption of permanent teeth were earlier in the mandible than that of their maxillary counterpart.

10. Co-relation of eruption of permanent teeth with the sex was variable. Eruption of central incisors, lateral incisors, canines and first premolars were earlier in female while second premolars and all the three molars erupted earlier in males as compared to females although difference was not significant.

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ATHERSCLEROSIS IN CORONARIES IN MALWA REGION OF PUNJAB

Dr. Harkirat Singh, Junior Resident, Forensic Medicine,GMC, Patiala
Dr.SS Oberoi, Associate Professor, Forensic Medicine, GMC, Patiala
Dr.RK Gorea, Professor & Head, Forensic Medicine, GMC, Patiala
Dr. MS Bal, Professor & Head, Pathology, GMC, Patiala

ABSTRACT

The study involves the gross and microscopic examination of coronary arteries of 200 cases of all age groups brought to mortuary of Rajindra Hospital Patiala for post mortem from Malwa Region of Punjab. The study was carried out to find out prevalence, pattern, frequency and severity of atherosclerotic changes in coronary arteries. The study was conducted in the department of Forensic Medicine and Department of Pathology Government Medical College Patiala.

Key Words:

INTRODUCTION

Crime rate is showing upward trend due to rise in population, unemployment and alcohol/drug addiction, earning competition, physical and mental stress etc. Today life has become very busy and hectic and food habits are changing. Pattern of diseases causing fatality is also changing. Therefore it is very difficult to label the exact role played by the two factors i.e. natural disease and trauma in cases of unnatural deaths.

On gross examination, atheromatous areas look like a raised yellowish plaque. Initially the lesion is focal and in late stages it becomes confluent. Uniform involvement of coronary artery is uncommon thus producing eccentric thickening of walls and narrowing of the lumen. Ulceration and thrombosis may be followed. Calcification and even ossification are some times seen.

Microscopically, atheromatous area shows increase of ground substance, disintegration of internal lamina, accumulation of foam cells containing fat in the intima and subintimal regions. Many of the cells rupture causing release of fat into the surrounding tissue exciting chronic inflammatory cell reaction. Areas of calcification and cholesterol clefts may be seen overlying intima which shows fibrosis.

The incidence of coronary arteries involvement is anterior descending branch of left coronary artery (45-64%) especially first part, right main coronary artery (24-46%) especially proximal part, left circumflex coronary artery (3-10%) especially first part and left main coronary artery (0-10%)[1].

The incidence of coronary artery disease is less common, amongst Nigerian as compared to the other races. In India it accounts for 85% of all the sudden deaths [1].

MATERIALS AND METHODS

CORONARY ARTERIES

200 cases brought to the mortuary of Rajindra Hospital Patiala were studied. Both the gross and histopathological examination of coronary arteries was done.

Right: - The coronary artery from origin (excluding ostium) to the margin of the posterior ventricular septum, excluding any branch.

Left: -

A) Left anterior descending: - The left coronary artery from its origin (excluding ostium) and the anterior descending branch excluding any of its subepicardial branches.

B) Circumflex: - The circumflex branch of left coronary artery excluding any of its subepicardial branches.

Coronaries were cut serially at 2-3 mms distances examined grossly in mortuary and histopathological examination was done in Pathology Department.

OBSERVATIONS

The present study was conducted to find out

the prevalence, incidence, pattern, frequency and severity of atherosclerosis. Further the various factors affecting the same were also studied and detailed observations were made from 200 cases as follows:

The above table is showing that the maximum number of cases in the present study was of the Road Side Accident 105(61.76%) and the minimum numbers of cases are from the Pulmonary Tuberculosis, gun shot and air tank blast. The total number of cases studied was 200 in number.

Table 1

Distribution of cases according to cause of death and sex

no.	Cause of death	Male		Female		Total	%age
		No.	%age	No.	%age		
1	Road Side Accident	105	61.76	8	26.67	113	56.5
2	Railway accident	7	4.18	3	10	10	5
3	Asphyxia	2	1.17	-	-	2	1
4	Poisoning	32	18.82	8	26.67	40	20
5	Burns	7	4.18	9	30	16	8
6	Fall in well	2	1.17	-	-	2	1
7	Pulmonary Tuberculosis	1	0.59	-	-	1	0.5
8	Electrocution	4	2.35	-	-	4	2
9	Domestic accident	6	3.53	1	3.33	7	3.5
10	Drowning	2	1.17	-	-	2	1
11	Gun shot	1	0.59	-	-	1	0.5
12	Assault	-	-	1	3.33	1	0.5
13	Air tank blast	1	0.59	-	-	1	0.5
	Total	170	100	30	100	200	100

Table 2

Distribution of cases according to Age and Sex

Age group	Male		Female		Total	
	No.	%age	No.	%age	No.	%age
0-10	-	-	-	-	-	-
11-20	24	14.16	4	13.38	28	14
21-30	47	27.65	8	26.67	55	27.5
31-40	47	27.65	8	26.67	55	27.5
41-50	24	14.16	4	13.33	28	14
51-60	15	8.82	4	13.33	19	9.5
61-70	8	4.70	1	3.33	9	4.5
71-80	4	2.35	1	3.33	5	2.5
81-90	1	0.59	-	-	1	0.5
>90	-	-	-	-	-	-
Total	170	100	30	100	200	100

The above table shows that in the present study the maximum number of cases 55(27.5%) were from the age group of 21-30 years and 31-40 years 55(27.5%). The minimum number of cases from the age group of 81-90 years.

Table 3

Distribution of cases according to Personal Factors

Personal Factor	Yes/No	No. of cases	% age
Diet	Vegetarian	47	23.5
	Non-vegetarian	153	76.5
	Total	200	100
Alcoholic	Yes	20	10
	No	180	90
	Total	200	100
Smoker	Yes	32	16
	No	168	84
	Total	200	100

The above table shows the maximum number of cases was Non-vegetarians, Non-alcoholics and Non-smoker.

Table 4

Comparison of atherosclerosis in RCA, LADA and LCX

Sr.no.	Grade of atherosclerosis	RCA		LADA		LCX	
		NO. OF CASES	%AGE	NO. OF CASES	%AGE	NO. OF CASES	%AGE
I	Mild	90	48	64	32	73	36.5
II	Moderate	27	13.5	82	41	25	12.5
III	Severe	4	2	17	8.5	1	0.5
IV	None	79	39.5	37	18.5	101	50.5
	Total	200	100	200	100	200	100

Above table shows maximum 4 (2%) cases with severe atherosclerosis in RCA, 17 (8.5%) in LADA and 1 (0.5%) in LCX

DISCUSSION

Atherosclerosis is a multifactorial disease affected by various factors, such as smoking, personality characteristics, alcohol consumption, presence of stress and strain in life etc. Many studies have been undertaken in the past to study the association of various factors leading to atherosclerosis and hence to CAD.

In past few decades Punjab has undergone a rapid change in the way of life style, eating habits, stress, strain and environmental pollution. In the present study a sincere effort has been made to study the effect of these various changed environmental factors on atherosclerosis.

Prevalence and Pattern of Atherosclerosis with Age

In present study it was observed that 170 cases (85%) were male and 30 (15%) were female which are more or less similar to most of the studies conducted in past, Murthy et al [2] studied 150 cases out of which 123 (82%) were males and 27 (18%) females. observed 74.5% and 25.5% females in their study, Padmavati and Sandhu [3] Tandon et al [4] found 66.5% males and 33.5% females, Bhargava and Bhargava [5] 74.8% males and 24.2% females in their study. The reason being that as the males are the bread earners and females usually doing the house hold chores, thus making the males more vulnerable to accidents, violence, stress etc. Maximum cases studied in present study were in the age group of 21-30 and 31-40 years.

Atherosclerotic changes develop very early in life starting from age of 17 years onwards. Over all incidence of atherosclerosis was found to be 156 (78%). Incidence in male in second decade 45.83 % and from fifth decade onwards it was 100% involvement in female. Least incidence was found in 0-10 year without any lesion in both sexes. Severity of lesion increased with increasing age. Earlier studies in India by Wig [6] found significant atheroma in 2/3rd of the cases above the age of 20 years. While Tandon [4] found atherosclerosis in 2nd and 3rd decades (14.3 %). Thereafter there was steep rise in both the studies. In past studies by, Murthy [2] observed 28%, Padmavati and Sandhu [3] found 24, 4%, Tandon et al 1969) seen 25.5% and by Bhargava and Bhargava [5] 20.40% maximum cases in age group of 21-30 years.

In the present study it was observed that maximum number of cases 55 (27.5%) belong to age group of 21-30 and 31-40 years each, reason being the active and fast life style of these age groups.

Incidence of atherosclerosis

The incidence of atherosclerosis in the present study was 78% (80% in males and 66.6 % in females), in previous studies incidence of atherosclerosis observed was 82% by Allison et al [7], 73% by Murthy et al [2], 67.3% by Padmavati and Sandhu [3].

In the present study, incidence of coronary atherosclerosis was 68% in males and 27% in females i.e. male have 41% more incidence of atherosclerosis than the females. Similarly in the previous studies also incidence of atherosclerosis was found more than in female [1]. The incidence of coronary arteries involvement in anterior descending branch of left coronary artery (45-64%) especially first part, right main coronary artery (24-46%) especially proximal part, left circumflex coronary artery (3-10%) especially first part and left main coronary artery (0-10%).

Factors Affecting the Prevalence and Severity of Atherosclerosis

In the present study the number of alcoholics

was 20. In alcoholics 7 cases had mild, 8 moderate degree of atherosclerosis; there was no case with severe degree of atherosclerosis. Non-vegetarian were 153 and had 4 cases were having severe, 22 moderate and 82 were having mild degree of atherosclerosis. Atherosclerosis in RCA, the incidence was more in smokers (71.9%) as compared non smokers (58.3), in the non-vegetarian (70.5%) where as (27.7%) in vegetarian, maximum cases are of alcoholics (75%) and in non alcoholics the incidence was 58.9%). It was concluded that smokers, alcoholics and non vegetarian were more prone to atherosclerosis.

SUMMARY AND CONCLUSIONS

The study showed that the male: female ratio distribution of cases was 170:30, the age of the cases varied from 15 to 82 years with coronary atherosclerosis was seen at the minimum age 18 years which are quite early age for development of atherosclerosis in coronaries.

It was seen that atherosclerosis was found in 78% of cases which is a very high incidence and it seems to correlate with changing habit and life style and environmental pollution. The commonest type of lesions in the present study was fatty streaks 45%. Alcohol, smoking, diet, type of job was not showing a linear correlation with atherosclerosis but seems to have severity of degree of smoking, alcohol consumption, also observed in vegetarian diet with low consumption of calories leads to lesser incidence of atherosclerosis and even if lesion to develop they are of less severity.

The maximum 27.5% cases each were studied from the age groups 21-30 years and 31-40 years, incidence of coronary artery atherosclerosis in male was 80% and 66.66% in females.

Incidence of coronary artery is very high in this part of Punjab State. Though the incidence of coronary artery disease is more in males as compared to females, but in both the sexes it is alarming.

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PREVENTION OF DROWNING AND ITS SOCIETAL IMPLICATIONS

Dr R K Gorea, Professor and Head
Dr Amandeep Singh, Junior resident
Department of Forensic Medicine, Govt. Medical College, Patiala

ABSTRACT

Death by drowning is not an uncommon phenomenon when stresses of the modern day life compel the person to end the life. In the regions where water sources are in abundance, e.g. rivers, canals, lakes, ponds and places near sea, these are readily available for such persons to end their lives. Homicides may also effected by pushing a person into well or canal. Accidents do occur when a person is walking or driving along a water source. We have to find out the reasons, by doing proper epidemiological studies, to find out ways to prevent such unnatural deaths. Daily we read some person committing suicide by one mean or other. In this ongoing study conducted in mortuary of Govt. Medical College, Patiala, relation of various factors like marital status, sex, age, etc with drowning were studied.

Key Words: Drowning, Sucides

INTRODUCTION

Suicides are getting daily news in our life. With increasing stress in the life of the person, some yield to these pressures and end their life. Various modes are adopted for suicides and depending upon the availability of these modes, the method is different in different region. In region like ours, most common type of living is by agriculture and water being fed by canal like Bhakra canal and other natural and artificial rivers. This water source is uncovered and quite near the habitat of the people thus becoming adopted mode of suicide in this region. This study was done to find out the factors, which are responsible for death by drowning and what measures can be suggested to decrease this rate of drowning. This study was done with a view to address wide ranging issues such as injury prevention, waterways safety promotion, suicide prevention, leisure related and sport safety, disaster management, etc [1,2].

MATERIAL AND METHODS

This is an ongoing study done from January 2001 to September 2005. All the cases brought for postmortem examination in the mortuary of Govt. Medical College were studied. Details of the case facts were noted which had an implication on the drowning and its prevention. Study group consist of total 2780 autopsies conducted in department of Forensic Medicine, Govt. Medical College, Patiala, Punjab. Deaths due to drowning cases were noted and all the relevant data needed were collected from the nearest relative.

RESULTS

A total of 2780 cases were studied, out of which in 121 cases cause of death was due to drowning.

Table1

No. of drowning cases in various age groups

Age group	No. of cases
0-10	3
11-20	22
21-30	30
31-40	38
41-50	19
51-60	5
61-70	3
71-80	1
Total	121

Table 2

Year wise distribution of cases

Year	Autopsies conducted	Drowning cases	
		Identity known	Unknown
2001	567	18	4
2002	550	21	5
2003	634	21	3
2004	627	34	6
2005	402	27	7
Total	**2780**	**121**	**25**

Table 3

Sex distribution of cases

Year	Autopsies conducted	Sex of the person	
		Male	Female
2001	567	15	3
2002	550	18	3
2003	634	16	5
2004	627	24	10
2005	402	19	8
Total	**2780**	**92**	**29**

Table 4

Showing Marital Status of the person

Year	Marital Status					
	Married			Un-married		
2001	9	Male	7	5	Male	5
		Female	2		Female	-
2002	14	Male	11	2	Male	2
		Female	3		Female	-
2003	8	Male	6	10	Male	7
		Female	2		Female	3
2004	16	Male	14	12	Male	7
		Female	2		Female	5
2005	12	Male	8	8	Male	4
		Female	4		Female	4
Total	**59**	Male	**46**	**37**	Male	**25**
		Female	**13**		Female	**12**

Table 5

Showing the distribution of death in different quarter of year

Months	Deaths due to drowning
1st January to 31st March	20
1st April to 30th June	50
1st July to 30th September	39
1st October to 31st December	10

Table 6

Showing distance of the water source from their habitat

Distance of water source from their habitat	Death due to drowning
Less than 10 km	58
10 to 20 km	26
More than 20 km	12

In total 2780, cases were studied out of which we encountered 121 cases (4.35%) of drowning. Males (76.03%) were more prone to drowning as compared to females (23.96%). Marital status of 96 persons was known out of which 61.45% were married and 38.5% were unmarried. Distance of water source from residence was within 10 km in 58 cases, within 10- 20 km in 26 cases and in 12 cases; it was more than 20 km. It is more in rural areas 54 cases as compared to urban areas 42 cases. Age group of 21 - 40 years was more prone to drowning (56.2%). Out of all these cases, 10 were accidental and one was homicidal case. 41.32% deaths were in the post-harvesting quarter of year.

CONCLUSIONS

Males were more prone to die by drowning and married persons had more deaths by drowning [3,4]. Females did not prefer to die by drowning. Distance of water source from the residence mattered a lot in deaths due to drowning. Those living near the water source had more deaths as compared to persons who lived at distance from water source. Percentage age of deaths decreased as the distance of water source from the residence [5,6] increased. We suggest that water sources near residences should have barricades so that there is not an easy access to water sources when an impulse arise to commit suicide Automatic Sensors be installed or guards should be posted along the water sources near the populated areas. Psychiatric help should be readily available to people in stress. Mass education should be provided so that seeking of psychiatric help should not be considered a taboo. It should be preferable if water conduits are covered rather than open canal system particularly near the inhabited areas. On the bridges there should be adequate lighting so that accidental drowning may be avoided. Modern guard/guide rail, traffic barrier w-beam, appurtenances and impact attenuators should be installed which enhances the road safety and causes diversion of the vehicle away from waterways. Bridge railing crash tests should be conducted before inaugurating bridges. Modern in-vehicle warning systems should be mandatory to prevent such accidents. Most of rural deaths were from agricultural background, and deaths were in post-harvesting season, with some relation to

monetary problems, so steps are necessary from the governments to ease loans and benefits to such communities.

Following conclusion were found from the study done

1. Most of the person dying due to drowning was from age group 21 to 40, which is most active age and exposed to external pressures.

2. Male opted for suicide with drowning as compared to females.

3. Married person found to commit suicide more as compared to unmarried person and that too males opted for drowning as mean of suicide

4. Maximum number of death due to drowning was in second quarter of the year i.e. from 1st April to 30th June.

5. Death due to drowning was found maximum in person whose residence was within 10km from the water source.

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SUICIDE - THE MAGNITUDE OF THE PROBLEM

Dr. Arun M. Assistant Professor
Dr.K.Yoganarasimha, Professor and Head
Department of Forensic Medicine, Kasturba Medical College Manipal - 576104, India
Dr Nilamadhab Kar,
Wolverhampton City Primary Care Trust, Wolverhampton United Kingdom.
Dr. Vikram Palimar, Assistant Professor
Dr. Manoj Kumar Mohanty, Assistant Professor
Department of Forensic Medicine, Kasturba Medical College Manipal - 576104, India
Dr Pinnamaneni Siddhartha
Siddhartha Institute of Medical Sciences and Research Foundation , Chinoutpalli, Krishna District, India.

ABSTRACT

Suicide is the second commonest manner of unnatural death flanked by accident and homicide. Suicide is by no means a simple issue, for it hinges on a spectrum of ethical, legal, sociological and psychological problems and it is yet to be offered an unequivocal and satisfactory answer to all the questions raised by this perplexing phenomenon. In an attempt to analyse the magnitude of the problem of suicide, this paper provides a comprehensive data encompassing the prevailing scenario of suicide, investigation of suicide as viewed by different workers and the importance of differentiation between accident, homicide and suicide The presentation is concluded by emphasizing the advantages of psychological autopsy in suicide investigation.

Keywords: Investigation, Psychological Autopsy, Suicide, Unnatural death.

INTRODUCTION

Suicide represents a major health problem. Human suicidal behavior is always been a source of dread and wonder to mankind. There is no single cause or a group of causes that can give a complete explanation about the suicidal rate. Another aspect of the problem is the under reporting of suicide to some extent everywhere. It is undeniable that the etiology of suicide still remains unknown. Research to date has neither unearthed nor revealed what possesses some individuals to effectuate their own demise and why such a desperate course of action is dictated. A psychological autopsy study is always rewarding in providing vital information regarding the prevalent psychosocial and psychiatric risk factors associated with suicide with respect to the place and time.

DISCUSSION

All suicidal people are not death seekers. Some attempt to communicate pain, to reduce isolation, to avoid consequences of social status change, to seek revenge and convey a whole lot of other meanings that are essentially individualistic[1,2,3]. Everyday thousands of people commit suicide in the world. Approximately one percent of the general population dies by suicide. It is currently the ninth leading cause of death in the United States [4].

About 400,000 people commit suicide every year throughout the world. Suicide is among the ten leading causes of death for all ages in most of the countries.4 In some countries, it is among the top three causes of death for people between 15 to 34 years. Rates per year are as high as 1 suicide per 1000 population (e.g. Falkland islands) and 1 suicide per 1500 population (e.g. Hungary) are reported [4].

According to the National Crime Records Bureau, suicide is among the top ten causes of death in India. Suicide is also among the top 3 causes of

death in India between 16 and 35 years[4]. The number of suicides in the country have risen from 40,000 in 1968 to 1.1 lakh in 1999 which means an increase of 175 percent in three decades. The national incidence rate stands at 11 per 1 lakh per year according to a study conducted by NIMHANS, Bangalore [5].

Methods of suicide employed generally reflect the availability of methods in the community. Pattern of suicide in a region depends upon variety of factors, ranging from availability and access of the method, to the socio-economic status of the individual and also not to forget the prevailing cultural and religious influences. Knowing the pattern of suicide in an area, not only helps in early management of such cases but also suggests taking earliest preventive measures [6]. It is necessary for the death investigators to be aware of the common scenarios, risk factors, methods and victims as well as pitfalls that may be encountered.

Different workers have studied the methods of suicide and attempted suicide in their respective workplaces. In a study conducted in Manipal, India, it was observed that out of the total 82 cases studied in a span of twelve months, 64% survived the attempt of suicide and 36% succumbed to it. Women have outnumbered men in non-fatal unsuccessful attempts [7]. Many studies have been conducted on the changing trends of suicide and the present scenario has been compared with the past. Suicide and the associated physical and mental disorders have also been studied.

According to the study of Bhatia et al and Agarwal et.al, the common methods used are poisoning, hanging, drowning and burning[8,9]. Chao et al, in their study on changing trends of suicide by poisons in Singapore, points out that until the early sixties, corrosive acids and alkali, inorganic chemicals, heavy metals and plant alkaloids were the mainstay of poisons principally used. The seventies and eighties witnessed a swing towards pharmaceutical products. The early nineties saw a peak of alcohol, insecticides such as malathion, paraquat and household items such as detergents, antiseptics [10].

Dode and Mohanty, in their study of suicide in women, reports that menstruation related psyche could be held responsible for committing suicide. The stage of menstruation was determined by vaginal cytology or endometrial histopathology[11]. The people who commit suicide by physical self destruction like hanging, burning, drowning, jumping from height, shooting, stabbing documented mental disorders in 38% of cases and only 20% of cases had a significant physical disease [12].

Eventhough, it is an accepted fact that no one single cause or a group of causes can give a complete explanation about the suicidal rate, certain factors like male sex, increasing age, widowhood, single or divorced state, childlessness, high density of population, residence in big towns, a high standard of living, economic crisis, alcohol and addictive drug consumption, a broken home in childhood, mental disorders and physical illnesses have found to be positively correlated with a high suicide rate [12].

Linda E Weinberger et. al believed that suicide is a psychological term and should be supported by psychological evidence. The term suicide refers to the decedent having a mental condition consistent with that of one who intends to end his life. While this may suffice a mental health clinician's definition of suicide, the law may apply more specific standard for suicide ruling[13] The California State Supreme Court had opined that, if the decedent did not understand the physical nature and consequences of the act, whether he was sane or insane, then he did not intentionally killed himself [13].

Martinez and Cameron preferred to label a case as 'suicidal' depending upon the analysis of each individual case history, whether there was a definite evidence of a suicidal intent or where the case history was highly suggestive of deliberate action regardless of the coroner's verdict. Factors considered important here are past psychiatric history, previous attempts or threats, objects found at the scene, written or verbal evidence, witness of deliberate action, post mortem findings and toxicology, wherever relevant[14]. There is yet another aspect of problem that needs to be considered is the under reporting of suicide to some extent everywhere. If the authority responsible for certifying deaths in a country is reluctant to report a death as suicide, the most likely categories for reporting the case are 'undetermined cause of

death' or 'accidental death [15].

Benett and Collins in their study had pointed out that eventhough there are approximately 30,000 suicides each year in the United States, and one suicide every twenty minutes, the suicide rate in the United States is at the mid point of the national rates reported to the United Nations by the industrialized countries [16].

A psychological autopsy study among suicides always provides vital information regarding the prevalent psychosocial and psychiatric risk factors associated with suicide with respect to the place and time. These interviews aim at revealing the prior mental disorder, personality disorder, physical disorder, family history, presumptive stressful life events and socio-demographic data. Interviews are usually conducted with key informants of suicides like a family member, a friend, a relative, a colleague or a neighbour [17].

Psychological autopsy studies are not free from lacunae. A systematic recall bias on the part of the informants of suicides is to some extent inevitable [17]. The informants may either underreport major personal events of suicides because they were not aware of them, or over report the events because of the informants' personal psychological reaction to the suicide [18].

Many cases of alleged suicide poses a challenge to the investigating authority and hence require a thorough examination of all aspects of the case. Statistical analysis of suicide rates since the early 1900's provide a general association between personal characteristics of the individuals who kill themselves. Berman notes that the autopsy surgeon's responsibility for certifying the manner of death has important medical, legal, social, economical and research implications for the determination of criminal liability, payment of insurance benefits and establishment of public health records[19] The study of Jobes et al hypothesizes that psychological information, in the form of brief psychological autopsies would significantly affect the certifications in equivocal cases [19]. It has been emphasized that psychological autopsies are similar to physical autopsies in that they investigate the antecedents of death and reveals the decedents' contribution to their own demise [19].

Hence for the Forensic investigator, to accurately assign the cause and manner of death in alleged suicides, s/he must be aware of the common methods of suicide, common histories, scenarios, risk factors, socio-demographic factors, cultural aspects and other established etiologies in relation to the practicing area. In practice, all suicide attempts should be evaluated as judicial facts so as to prevent possible suicide attempts in the future and general practitioners are expected to refer such cases to the judicial organs without delay. The instances of deliberate self-harm consists of suicide, parasuicide and suicidal gestures, the latter lacking the intention to kill though death may inadvertently ensue [20]. Differentiation between suicide, homicide, accident and other self inflicted injuries merits paramount importance from medico legal standpoint. The opinion and decision of the autopsy surgeon about the manner of death may be crucial in initiating or aborting a homicide investigation.

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TEACHING, TRAINING AND PRACTICE OF FORENSIC MEDICINE IN INDIA - AN OVERVIEW

Dr. B. R. Sharma, Reader,
Dr. D. Harish, Reader,
Dr. K. H. Chavali, Sr. Lecturer,
Dept. of Forensic Medicine and Toxicology, Govt. Medical College & Hospital, Chandigarh, India

ABSTRACT

Forensic medicine & Toxicology, an important and integral part of medical education, has been a silent spectator to its ups and downs in the recent past. Having had its glory at times, playing pivotal role at places in aiding criminal justice, it has unfortunately failed to sustain the impetus and its importance. Furthermore, Medical Council of India (MCI) - the national medical supreme body, has come down heavily on this specialty in general and on its curriculum in particular at the undergraduate level, pushing it down to the cross roads. The increasing legal awareness among the masses, frequent unsavory remarks on the doctors by the judiciary, bringing medical profession under the purview of the Consumer Protection Act in contrast to the decreasing of importance of the subject in the medical curriculum coupled with casual approach to the subject both by the teacher and the taught have all culminated into a situation where fate of the subject befits the words of Sir Winston Churchill, "This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."

INTRODUCTION

Medical education, in India, is guided by the regulations laid down by the Medical Council of India at both the undergraduate [1] and postgraduate2 levels. Uniformly, the undergraduate level of teaching essentially consists of a curriculum spanning four-and-a-half years followed by a twelve month period of compulsory practical 'on-hands' training (internship) and leading to the award of degree of MBBS. The post-graduate curriculum consists of three years of 'in-house' teaching, along with specialized practical knowledge in the field and training in various research methodologies.

The curriculum of medical education has undergone a considerable change during the last decade, the most notable innovation being the widespread introduction of problem-based/ case-based teaching methodology. The students are also encouraged to become good communicators, team players, develop effective organizational skills and build a sound base of clinical knowledge and skills [3]. Early introduction to clinical settings is the other, which is being followed even in the west [4]. The students, early in their field, get to have first hand exposure and knowledge of the various clinical skills as well as the subtleties of the doctor-patient relationship/ interactions.

Even though these innovations have been widely lauded and are being seriously implemented by several institutions, they have been largely confined to the paper and "window-dressing" by numerous other institutes-both governmental and private. The usual finished products of these so-called institutions of higher learning are the "Pseudo-experts", who are neither learned nor experienced.

Many medical practitioners, faculty, and the student-doctors themselves perceive that there has been an apparent decline in the doctor-professionalism i.e. the approach of a doctor towards his patient is not as humane and empathetic as it was in the past. The corporatisation of the health-care sector, the mushrooming of numerous nursing homes and private colleges, etc, have played a major role in this development.

UNDERGRADUATE TEACHING

At the undergraduate level, adequate emphasis is placed on cultivating logical and scientific habits of thought, clarity of expression and independence of judgement, ability to collect and analyse information and to correlate them. The general aim of undergraduate medical education

in India is to produce a physician of 'first contact' who would be capable of looking after the preventive, promotive, curative and rehabilitative aspects of medicine [1].

Every student of the MBBS course has to undergo a period of certified study extending over four-and-a-half academic years divided into nine semesters of six months duration each. Forensic Medicine, as a part of the undergraduate curriculum, is taught in the second phase (3rd to 5th semester), along with the other three Para-Clinical subjects. The 9th semester is followed by one year of compulsory rotating internship.

The broad goal of teaching of Forensic Medicine in our country is to produce a physician who is well informed about the medico-legal responsibilities in the practice of medicine [5]. The ideal student would be capable of making accurate observations and inferring conclusions by logical deductions so as to aid in the administration of justice in all medico-legal problems as well as acquire knowledge of law in relation to medical practice- including medical negligence, and respect for Codes of Medical Ethics. He would be able to diagnose and manage common acute and chronic poisonings, besides identifying and adequately dealing with the associated medico-legal problems.

Teaching methodology usually includes didactic lectures, demonstrations of post-mortem examinations and clinical cases, practical laboratory training; besides tutorials, case-based/ problem- based teaching etc., as have been introduced by the Govt. Medical College, Chandigarh; along with some other institutions. Fifteen days compulsory and 15 days optional training in Casualty and Forensic Medicine, respectively, is imparted during Internship where-in the student is expected to acquire the knowledge of various medico-legal responsibilities and learn to identify medico-legal problems, prepare medico-legal reports, conduct meticulous post-mortem examinations, diagnose and treat common poison conditions, etc., through supervised observation.

However most of the afore-mentioned teaching and training methodologies and the curricula are actually not practised in a majority of the medical institutions [6] and at the most, are given a token 'lip-service'. The majority of the students and the faculty themselves, do not actually perceive and understand the importance of the subject.

Any act done by a medical practitioner in diagnosing, investigating and treating a disease condition has medico-legal implications. The subjection of the medical profession to the purview of the Consumer Protection Act and the growing awareness of the public of their rights and the duties and responsibilities of the doctor has further compounded the problems. All this gives credence to the fact that Forensic Medicine as a subject in the undergraduate curriculum and a speciality in the postgraduate curriculum, has grown in importance.

However, the Medical Council of India, in its wisdom, has reduced the weightage, and thereby the importance, of this essential subject. From 150 marks in the undergraduate second Professional Exam, previously, the present weightage is only 100, the Theory Paper of two parts having a total of only 40 marks [1]. The rationale behind this is hard to understand. With the growing importance of this field, its importance as a subject in the undergraduate curriculum should have increased, but here, the opposite has happened. The speciality, as a whole, and its Official Body, the Indian Academy of Forensic Medicine, have been just relegated as mute spectators to the ups and downs of the status of this field. Having had its glory, at times playing a pivotal role in aiding justice, it has unfortunately failed to sustain its impetus, particularly in the recent past [7].

Taking the students perspective into consideration, the common feelings are that:

1). Forensic Medicine, as a subject, is not of much importance for medical practice [8]-hence does require much effort and time.

2). An overnight study is enough to clear the subject, as there is not much course - either theoretical or practical.

3). The teachers usually pass the students, anyway.

An appreciable percentage of the Faculty, unfortunately, has the same view and frame of mind. A very harsh reality of the field is that quite a number of the members of the faculty have taken to this speciality, as they had no other choice. Given a chance, most of them would opt out. Hence they are not sincere to this field and as a result do not

have the requisite knowledge nor take enough pains and interest, necessary to impart proper training to the students. Naturally, In turn, they cannot expect much from the students.

POST GRADUATE TEACHING

The general goal of postgraduate medical education is to produce competent specialists and/ or medical teachers [2]. The major components of this curriculum are - theoretical knowledge, practical skills, thesis skills, attitudes including communication skills and training in research methodology. Every institution undertaking postgraduate training program is required to set up an Academic Cell or a Curriculum Committee which works out the details of the training program in a particular specialty and coordinates and monitors the implementation of these training programs which are usually updated as and when required. Postgraduate training in Forensic Medicine includes proper training in basic medical sciences related to forensic medicine and as such the postgraduate student is posted in various departments like Anatomy, Pathology, Microbiology, Casualty, Radiology, Psychiatry, Forensic Science Laboratories, etc. in order to gain experience in these allied fields. The aim is to provide the postgraduate student with all the requisite knowledge in the related fields so that he would be in a position to evaluate and analyze any medic-legal problem in its entirety so that an effective and just solution is reached. The candidates are required to participate in the teaching and training programs of undergraduate students and interns. **This plays a very important role in the postgraduate training program**

1. The knowledge that has been assimilated by the PG student is reinforced by recollection and analysis required for teaching the students and effectively answering their queries.

2. The PG student learns about the nuances of the teaching methodologies, which would in turn put him in a great stead in his later life when he would become a consultant in the field.

Ideal training methodology includes lectures, seminars, journal clubs, group discussions, case discussions including medicolegal injury reports/ postmortem reports prepared by him/her; participation in laboratory and experimental work and involvement in research studies. A PG student is also required to carry out research work on an assigned project under the guidance of a Postgraduate Teacher. The aim of thesis writing is to contribute to the development of a spirit of enquiry besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical sciences and the manner of identifying and consulting available literature.

After completion of the course, he is required to gain teaching experience for three years as a lecturer/ senior resident/ tutor/ demonstrator, before he is eligible for the faculty posts in the subject. This post-PG exposure, as it is locally called, plays an important role by helping the candidate brush up his knowledge and learn new things in addition to the experience of teaching and research. The period of post-PG experience is also to be utilized in pursuing research activities, which hitherto were restricted mainly to the thesis work during the post graduation.

The interaction between a postgraduate trainee and his supervisor is complex and may be fraught with difficulties. Good supervision provides an environment that allows responsiveness to an individual's needs. The learning environment should be conducive to 'facilitation', 'openness' and 'availability' to meet the trainee's changing needs9. The trainee, in turn stimulates his supervisor by his thought process and questioning, thereby fuelling his thirst for knowledge. This is why, now a days, this process is universally recognized as a "teaching-learning" process.

However, there is a complete lack of a well-defined curriculum for PG teaching in most universities and the institutions impart the training in an arbitrary manner. The assessment is itself done in a subjective manner [10]. It is neither case / problem based nor does it provide an accurate and comprehensive analysis of the capabilities of the candidate. In a number of institutions, the candidate is awarded the degree just because he was a member of the department for the prescribed duration [6].

The thesis itself is mostly confined to "Statistical studies-Profile of cases of poisoning/ accidents/ homicides/ hanging and such deaths, etc"-which require no research on part of the PG, only counting of the "dead bodies". In only a handful of institutes, Government Medical College Hospital,

Chandigarh, being one of them; is actual original research work done by a post-graduate.

SUGGESTIONS

1. Direct entry in to a medical college after 10 + 2, which is the norm now, should ideally be amended to include a aptitude test before the student takes 'Medical Stream' in + 1. After clearing the + 2 and the medical entrance exam the student should further be subjected to another aptitude test and only those who clear it with clear indications of pursuing the medical course of their own free will and with sincerity, should be admitted to the course. This will vet out those students who pursue the course because their parents had the money and pushed them in to the field despite their inclination towards other fields. Those students who join the course would naturally realize the significance of all subjects, Forensic Medicine, included. Alternatively, we may expose the students at high school level to the working of the hospitals as a part of extra-curricular or vacation activity, to help the understand the diverse working conditions in health-care system and self-assess their aptitude towards the profession.

2. The mushrooming of medical colleges, both private and governmental, at every available space needs to be stopped. This only increases the percentage of disinterested but forcibly 'inclined' students who have been admitted against their wishes and who will get the degree by any means-legal or otherwise.

3. Good, working, stimulating and interactive teaching methodologies should be adopted while teaching Forensic Medicine. Actual cases performed by the department should be included while making the students understand various topics. Inclusion of personal examples serves to increase the curiosity of the students, there by making the subject more interesting.

4. At least a working Forensic Museum and Laboratory with adequate number of specimens, models, weapons and poisons, etc., as prescribed by the MCI, along with facilities for simple experiments like blood-stain, seminal-stain and hair examinations, etc, continue to be wanted in many recognized medical institutions. This will go a long way in stimulating the curiosity and the subsequent interest of the students in the subject.

5. More practical demonstrations of actual medico-legal cases, post mortems, age examinations, etc, would further the interest of the students.

6. The Medical Council should be approached to restore the weightage of the subject in the second professional exam. This would make the students believe in the subject's importance and not just dismiss it as something that "has to be passed".

7. Clinical Toxicology and Clinical Forensic Medicine should be practiced and not just taught in theory. Forensic specialists should be made in charge of all the medico-legal cases reporting to the Casualty and the admission and discharge of such cases should be with their prior approval, as is practiced in Rajasthan. All poisoning cases should be managed under his guidance and supervision.

8. Postgraduate courses should be started in only those institutions whose Forensic Medicine Departments are actively involved in medico-legal work, i.e. conducting medico-legal and postmortem examinations as well as management of poisoning cases.

9. The faculty in the field of Forensic Medicine needs to develop sincerity and interest towards their chosen field. After all, they have to spend a great part of their life in it. Only if they develop this and do not feel inferior to their clinical brethren, would they be able to do justice to Forensic Medicine and instill interest and curiosity among both the under graduates and the postgraduates.

10. Extra incentives need to be given to the faculty, may be in form of remuneration per medico-legal case/ autopsy conducted, as is the case in some South Indian states. This might help in attracting good, academically inclined graduates to pursue post graduation in Forensic Medicine and hence; the future faculty in the subject.

11. Almost uniformly throughout the country (with a few exceptions) the mortuary is located in a remote and undeveloped area of the hospital. It has a shabby unkempt look with broken and dirty furniture and equipment; is highly unhygienic, unventilated and ill-illuminated. Majority of the attendants working there would be in an inebriated condition at any given time. Just the thought of the impact that it would have on the students would

send jitters down the spine of any self-respecting forensic expert. A complete overhaul of the mortuary and its surroundings is a must even before we can contemplate making the subject respectworthy to the common man in general and the medical students in particular.

12. In almost all the cases, medicolegal examinations on the living involve clinical evaluation of varying degrees, as most the trauma / poisoning outcomes have major clinical requirements besides the medicolegal implications. Students, who are taught forensic medicine during the 3rd to 5th semester of their undergraduate curriculum, fail to realize the importance of the subject. Hence the specialty needs to be included as a clinical and not paraclinical subject and should be taught during the 6th to 9th semester in order to achieve the status it truly deserves.

CONCLUSION

According to the MCI 'Regulations on Graduate Medical Education, 1997, the medical student at the end of undergraduate program should be able to become an exemplary citizen by observation of medical ethics and fulfilling social and professional obligations, so as to respond to the national aspirations. However, the important fact that the undergraduate training should be directed to the type of problems, which every doctor may face in practice when he/she qualifies, has been overlooked. In view of the burning legal issues the doctors are faced with and the MCI motto of training a need based doctor, should future doctors not be imparted with sufficient knowledge in the subject of Forensic medicine & Toxicology too? Therefore, everything that we teach must be subjected to the scrutiny of its relevance to the needs of a self-reliant and complete doctor on one hand and the needs of our community and the nation on the other. Our medical education system must assure that the graduate and postgraduate education meets the standards appropriate to the future needs of medical professionals.

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RECENT SCENARIO OF CRIMINAL NEGLIGENCE IN INDIA DOCTOR, COMMUNITY & APEX COURT

Dr. Mukesh Yadav, Associate Professor
Dr. Harnam Singh, Assistant Professor
Dr. Gaurav Sharma, Assistant Professor
Dr. A.D. Aggarwal, Assistant Professor
Deptt. Of Forensic Medicine, M.M. Institute of Medical Sciences & Research, Mullana, Ambala-133203

ABSTRACT

The subject of "criminal negligence by doctors" is always a complex matter for medical fraternity and a great challenge before judiciary. In recent years, sudden spurt of cases of "negligence" (about 20000 a year as estimated by the IMA) and decision of two Judges Bench of SC in Dr. Suresh Gupta vs. Govt. of NCT of Delhi, on 4th August 2004, and another decision by three Judges Bench of Apex Court, exactly after one year i.e. on August 5, 2005 in an appeal filed by Dr. Jacob Mathew of CMC, Ludhiana, Punjab, raises a fresh debate and gives an opportunity to medical fraternity for introspection about implementation of medical ethics, update of knowledge and enhancement of skill, but not an immunity against filing of 'criminal negligence suits' against them.

This paper deals with recent scenario of "Criminal Negligence" in India, its impact on medical fraternity, law-enforcing agencies and in large on community and applicability of SC's Guidelines of 2005 for registration of cases u/s 304-A IPC against doctors in case of death of patient during treatment.

Key Words: Community, Criminal, Doctor, Gross, Judiciary, Negligence.

INTRODUCTION

With the increasing awareness in the society and the people in general, gathering consciousness about their rights, actions for damages in tort are on the increase. Not only civil suits are filed, the availability of a Consumer forum for grievance redressal [1] having jurisdiction to hear complaints against professionals for 'deficiency in service', has given rise to a large number of complaints against doctors, being filed by the persons feeling aggrieved [2].

Criminal complaints are being filed against doctors alleging commission of offences punishable under Section 304A or Sections 336 / 337 / 338 of the IPC alleging rashness or negligence on the part of the doctors resulting in loss of life or injury (of varying degree) to the patient [3].

No sensible professional would intentionally commit an act or omission which would result in loss or injury to the patient as the professional reputation of the person is at stake. A surgeon with shaky hands under fear of legal action cannot perform a successful operation and a quivering physician cannot administer the end-dose of medicine to his patient. To draw a distinction between the blameworthy and the blameless, the notion of mens rea has to be elaborately understood [4].

Brief Review of Apex Court Decision

When a two Judges Bench observed that the words "gross negligence" or "reckless" act did not fall within the definition of Section 304-A IPC. The much-debated judgment of the Apex Court5 was referred to a larger bench for reconsideration on September 9, 2004, further confirms complexity of legal words used in cases of negligence against doctors.

The order of reference has enabled Apex Court to examine the concept of 'negligence', in particular 'professional negligence', and as to when and how it does give rise to an action under the criminal law. Apex Court proposes to deal with the issues in the interests of settling the law.

In addition to Medical Council of India, 'People for Better Treatment', Kolkata (a registered society);

Delhi Medical Council, Delhi Medical Association and Indian Medical Association sought for intervention at the hearing as the issue arising for decision is of vital significance for the medical profession. Apex Court's decision centered around two issues:

(1) Is there a difference in civil and criminal law on the concept of negligence?

(2) Whether a different standard is applicable for recording a finding of negligence when a professional, in particular, a doctor is to be held guilty of negligence?

Negligence as a tort

The jurisprudential concept of negligence defies any precise definition. Eminent jurists and leading judgments have assigned various meanings to negligence [6, 7, 8]. The concept as has been acceptable to Indian jurisprudential thought is well-stated in the Law of Torts as:

"Negligence is the breach of a duty caused by the omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs would do, or doing something which a prudent and reasonable man would not do. Actionable negligence consists in the neglect of the use of ordinary care or skill towards a person to whom the defendant owes the duty of observing ordinary care and skill, by which neglect the plaintiff has suffered injury to his person or property [9].

The definition involves three constituents of negligence:

1. A legal duty to exercise due care on the part of the party complained of towards the party complaining the former's conduct within the scope of the duty;
2. Breach of the said duty; and
3. Consequential damage.

Cause of action for negligence arises only when damage occurs; because damage is a necessary ingredient of this tort.

According to another school of thought, in current forensic speech, negligence has three meanings [10].

1. A state of mind, in which it is opposed to intention;
2. Careless conduct; and
3. The breach of duty to take care that is imposed by either common or statute law.

All three meanings are applicable in different circumstances but anyone of them does not necessarily exclude the other meanings [3] .

Essential Ingredients of Criminal Negligence

The word 'gross' has not been used in Section 304-A, IPC, yet it is settled that in criminal law: negligence or recklessness, to be so held, must be of such a high degree as to be 'gross'. The expression 'rash' or 'negligent act' as occurring in Section 304-A, IPC has to be read as qualified by the word 'grossly [3].

For negligence to amount to an offence, the element of mens rea must be shown to exist [11,12]. Negligence which is neither gross nor of a higher degree may provide a ground for action in civil law but cannot form the basis for criminal prosecution [13] .

It is the amount of damages incurred which is determinative of the extent of liability in tort; but in criminal law it is not the amount of damages but the; amount and degree of negligence that is determinative of liability [3]. The element of criminality is introduced by the accursed by having run the risk of doing such an act with recklessness and indifference to the consequences [14] .

To prosecute a medical professional for negligence under criminal law, it must be shown that the accused did something or failed to do something which in the given facts and circumstances no medical professional in his ordinary senses and prudence would have done or failed to do. In order to hold the existence of criminal rashness or criminal negligence it shall have to be found out that the rashness was of such a degree as to amount to taking a hazard knowing that the hazard was of such a degree that injury was most likely imminent.

Liability of doctors under criminal law

A medical professional may be held liable for negligence on one of the two findings:

1. Either he was not possessed of the requisite skill which he professed to have possessed, or,
2. He did not exercise, with reasonable competence in the given case, the skill which he

did possess.

Applicability of doctrine of 'Res ipsa loquitur':

Res ipsa loquitur is only a rule of evidence and operates in the domain of civil law especially in cases of torts and helps in determining the onus of proof in actions relating to negligence. It cannot be pressed in service for determining per se the liability for negligence within the domain of criminal law. Res ipsa loquitur has, if at all, a limited application in trial on a charge of criminal negligence [3].

Doctors are protected by the Law

Section 88 IPC provides exemption for acts not intended to cause death, done by consent in good faith for persons' benefit. Section 92 IPC provides for exemption for acts done in good faith for the benefit of a person without his consent though the acts cause harm to a person and that person has not consented to suffer such harm. Section 93 IPC saves from criminality certain communications made in good faith [3].

Degree of Proof in Criminal Negligence

In civil proceedings a mere preponderance of probability is sufficient and the defendant is not necessarily entitled to the benefit of every reasonable doubt; but in criminal proceedings, the persuasion of guilt must amount to such a moral certainty as convinces the mind of the Court, as a reasonable man, beyond all reasonable doubt [15].

Where negligence is an essential ingredient of the offence, the negligence to be established by the prosecution must be culpable or gross and not the negligence merely based upon an error of judgment [16, 17].

Nobility puts the Medical Professionals on different footing

Apex Court's holding that "negligence in the context of medical profession necessarily called for a treatment with a difference, the negligence attributed to the doctor must be gross in nature to make him liable for criminal prosecution [3].

Noticing a sudden increase in the cases of doctors being subjected to criminal prosecution, the Apex Court laid down elaborate guidelines so as to shield the doctors from frivolous criminal prosecution. Court said many complainants prefer recourse to criminal process as a tool for pressurizing the medical professional for extracting uncalled for or unjust compensation. Such malicious proceedings have to be guarded against.

Role of Expert's opinion

No case of criminal negligence should be registered without a medical opinion from Expert Committee of doctors. IMA Punjab has claimed that "they had secured a directive from DGP Punjab that no case of criminal negligence can be registered against a doctor without a report from an Expert Committee [18]. Similar is the case in the State of Delhi.

Apex Court in a recent case5 also endorsed the same view and said "criminal prosecution of doctors without adequate medical opinion would be great disservice to the community - as it would shake the very fabric of doctor- patient relationship with respect to mutual confidence and faith. The doctor would be more worried about their own safety instead of giving best treatment to their patients".

Reactions of Medical Fraternity

The IMA welcomed the Apex Court's decision limiting the doctor's liability under the criminal law. "The court had drawn a clear line between simple error of judgment and gross negligence. Medical science had many inherent risks but without giving consideration to this, charges were framed against doctors under Sections 304 and 304A of the IPC. Apex Court's guidelines regarding the registration of case and arrest of the doctors had come as a relief to the medical fraternity as now no case would be made out against any doctor without the opinion of an expert of the field [19].

"The judgment of the SC saying doctors cannot be prosecuted for simple lack of care or error of judgment which would result in better patient care without any fear of harassment by the law enforcement agencies in the event of unwanted outcome during the treatment of complicated and even ordinary cases [20].

Community and Criminal Negligence

It could, however, be argued that it is a noble profession; one expects high standards of service and commitment. Those who compromise on it should be severely penalized. If a driver makes an error of judgment and runs over a pedestrian he is put behind bars. Why should not the same rule apply to doctors? The court has left that for a panel of doctors to decide. Very few doctors will be willing

to put a fellow doctor in the dock and certify a case as criminal negligence. Involving a medical teacher instead of a practicing doctor along with consumer activists would have been better [21, 22] .

What are Apex Court's Guidelines: 2005?

1. Mandatory prima facie evidence:

A private complaint would not be allowed unless complainant produces prima facie evidence before a court in form of an 'opinion by another doctor supporting his charge of 'recklessness' or 'gross negligence'.

2. Directions for Police

Before proceeding against doctor on the allegation of criminal negligence, the IO should obtain independent and competent medical opinion on the facts (like P.M. Report & Opinion of board of doctors working in the same specialty including forensic medicine expert preferably form medical teacher's community, involving NGOs or Social worker).

3. Directions in Matter of Arrest

Doctor may not be arrested as a matter of routine. But arrest of doctor should be delayed unless required for furthering probe or collecting evidence or if there is a chance of his not being available for probe or when try to obstruct probe or not cooperating law enforcing agencies.

A doctor may be arrested, if his arrest is necessary for furthering the investigation or for collecting evidence or the doctor would not make himself available to face prosecution unless arrested [Paras 54 & 55].

Proposed Guidelines for Arrest

There must be allegation of criminal negligence on the part of doctor, supported with an opinion from another doctor to register a case u/s 304A IPC.

I.O. must confirm the death and ask for autopsy by a board of doctor (at least 3 comprising one from same specialty under which deceased was getting treatment, one forensic medicine expert).

SDM / Executive Magistrate should hold inquiry as in case of custodial death.

Independent inquiry by IMA by board of doctors who are competent and respectable in the locality.

Arrest executed only, if alleged accused doctor is non-cooperative and obstructing the inquiry or cause disappearance of evidences.

Consideration should be given to doctor's reputation, his experience, and previous allegations, number of prospective and admitted patients under his care. Adverse publicity should not be allowed.

Involving NGOs, Social Workers, or some respectable citizens.

Provision of bail as per the Criminal Amendments Act-2005.

Highlights of Decision [23].

Doctors cannot be held criminally liable under Section 304A, IPC unless they are 'grossly' or 'rash' or 'negligent' in performing their duties.

The onus of proving that a doctor was 'grossly' or 'rash' 'negligent' would lie on the complainant i.e. prima facie case.

The Court noted that unless the threat of being subjected to 'frivolous' criminal complaints was removed, no doctor would take the risk of saving a patient at 'terminal stage'.

The subject of negligence in the context of the medical profession necessarily calls for treatment with difference. Thus, acknowledging the complex nature of doctor's job.

A simple lack of care, an error of judgment or an accident, is not proof of negligence on the part of a medical profession.

This judgment upheld an earlier judgment delivered by a two Judges Bench of SC.5

Doctors could not be prosecuted; as it was not the complainant's case to decide that they were not 'qualified'.

Hospital may or may not be liable on the civil side depending on the facts and circumstances of each case i.e. no restrain on filing a case under law of 'Tort' for damages.

Union Government to frame detailed guideline in consultation with MCI, but till that time Apex Court's Guidelines will remain effective.

How to deal with Criminal Negligence Allegations:

Doctor should be prepared to face allegation of criminal negligence when death occurs during treatment. Take the patient's relative or friend or

social workers in confidence. Inform the police, complete the patient's record meticulously. Put on record notes regarding CPR, use of ventilator and other emergency treatment, opinion of senior colleagues. If, there is any possibility of allegation of criminal negligence, never handover the body of deceased without autopsy, always call the police. If possibility of arrest is there, arrange for anticipatory bail. Be prepared to face the trial. Don't disturb the scene of incident, or remove evidence from the scene. Cooperate with investigating agencies. Take help of local IMA, and competent advocate and forensic medicine expert dealing with these types of cases. Keep ready surety / Documents for bail. Know your rights while in custody to avoid unnecessary harassment by the police. If illegal detention, inform higher police authority, or do registered letter/ fax to NHRC, SHRC etc. never try to give threat, or bribe to deceased relatives or friends.

SUMMARY AND CONCLUSIONS

Criminal responsibility carries substantial moral overtones. Some of life's misfortunes are accidents for which no body is morally responsible, others are wrong for which responsibility is diffuse, yet others are instances of culpable conduct & constitutes grounds for compensation & at times for punishment. To distinguish between these categories requires careful, morally sensitive & scientifically informed analysis [3].

It is claimed that the judgment will go a long way in improving doctor-patient relationship, patient care, confidence of medical professionals and the role of the State Medical Councils in dealing with cases of medical negligence. The Central and State Government while making necessary guidelines for framing charges of criminal negligence against a doctor should include at least three doctors in the board, with two doctors of same specialty against whom the complaint has been lodged, and one forensic medicine expert, keeping in view the legal implications of the complaint [25].

It is hoped that it would stop the misuse of law against the doctors since; it had become a sad trend that doctors were unduly made targets without knowing the real cause. However, Apex Court does not ruled out possibility of doctor's liability for civil negligence in such cases of trivial nature of medical negligence.

Consumer activist seem to have their doubts regarding requirement of prima facie evidence, that "no doctor will come forward and support charges against another. Also, this may make the process long-drawn. Even people with genuine complains may be discouraged from coming forward". Their doubts are supported by the fact that after framing of ethical guidelines [26] by the MCI (Chapter I, Point 1.7), very few or almost negligible number of doctors coming forward for complaining unethical acts of their colleagues, which is their one of the duty.

There is intense need to create awareness about this decision of the Apex Court3 as well as educate public about accepting bad consequences of treatment, accidental and unexpected results of the treatment as many cases of criminal negligence are still reported by the media[27, 28, 29]. Now the onus is on every member of medical fraternity, various medical associations including IMA and the State Medical Councils, and the MCI to come forward and play their much needed role in implementation of ethical guidelines in later and sprit, to remove the reasonable doubts from the minds of consumer activists and common people. Response of Central Government, State Governments and MCI is still awaited, till that time these guidelines of Apex Court will serve the purpose of law

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PARTIAL POSTMORTEM NEGLIGENCE OR ?

Dr. Mohammed Iliyas Sheikh, Professor and Head,
Dr. S. Kumar, Associate Professor,
Dr. S. S. Agarwal, Assistant Professor,
Dr. Lavlesh Kumar, Assistant Professor,
Department of Forensic Medicine & Toxicology, SMIMER, Surat.

ABSTRACT

Dead body of a 16-year-old female was brought for postmortem at the mortuary of New Civil Hospital, Surat from a nearby district. The body had been subjected to a medicolegal postmortem a day before at a local hospital. But the relatives suspecting foul play in the postmortem asked for a re-postmortem by Forensic Experts at New Civil Hospital. The second postmortem revealed no foul play yet raised many a questions to be answered. The details are discussed in the paper that needs sincere thought.

Key Words: Partial postmortem, Negligence, Hanging, Complete postmortem

INTRODUCTION

Medicolegal postmortems are being conducted to protect the interests of the society at large. The aim is to rule out any foul play in any unnatural or suspicious natural deaths. This is the reason why a thorough and complete postmortem has been made compulsory even if the cause of death is obvious or found out by examining only a part of the body. But what is to be done if Registered Medical Practitioner performs incomplete or partial postmortem is still unclear. Here is a case presented where on second postmortem, it was revealed that a postmortem hadn't been performed at all earlier in a true sense.

Case report

On 02-02-2000, dead body of a 16-year-old female was brought for postmortem at the mortuary of New Civil Hospital, Surat.

On eliciting the history, it was a case of suicidal hanging as perceived by the police. The girl was found in state of hanging in her room. There were no signs of struggle in the room. The scene was also in accordance with the suicidal theory. A medicolegal postmortem was conducted by Superintendent of Government hospital and cause of death was given to be asphyxia due to hanging. But the relatives of the girl suspected foul play and alleged that the girl had been gang raped by her employer with his friends and either they have killed her and suspended or the girl had committed suicide out of shame in the society. They alleged that there was tampering with the postmortem, the report was a foul one as the accused had good contacts in the area and demanded a second or re-postmortem by Forensic Experts at Medical College and New Civil Hospital, Surat.

Along with the body and usual papers required for the postmortem, a copy of the first postmortem report was also brought. On going through the report, it was a surprise to read that only neck had been dissected while rest of the body was not dissected at all. There was absence of state of postmortem lividity in the report; no signs of struggle were positively noted. Neck examination had revealed a circular, near horizontal ligature mark consistent with the ligature material, protruding tongue, dribbling of saliva from angles of mouth (side not specified), congestion of trachea and epiglottis with rupture of intima and media of carotid artery (side not specified). The rest of the body was not opened at all. Cause of death given was asphyxia due to hanging.

On examining the body at second postmortem, the body was in early state of decomposition with greenish discoloration all over the body and marbling at places. Fingernails and

lips were discolored blue. Oblique ligature mark with pattern of ligature material was present. Routine midline postmortem incision from chin to symphysis pubis was also present, that too stitched. On opening the previous postmortem incision, it was a surprise to find that only neck was dissected whereas over the chest and abdomen, the incision was only subcutaneous deep. Neck structures did not reveal any injury or fracture. Rest findings were insignificant except for the fact that cranial cavity, chest cavity and abdominal cavity were not opened at all the previous postmortem.

Viscera were preserved for chemical analysis and histopathological examination. After receiving the reports, Cause of death was given as Asphyxia due to hanging- same as that given in earlier postmortem.

DISCUSSION

A Registered Medical Practitioner has to perform complete postmortem. If he fails to follow the rule, he is considered to be negligent in his duties. Here is a case where a doctor performed partial postmortem. Though the second postmortem maintained the findings of earlier postmortem, partial postmortem is still against the rules. It is type of medical negligence, Cognizable or Non Cognizable still a matter of debate. Legally, if findings of both the postmortems come out to be the same and the matter comes before the court, then either the doctor may be just given warning or the Medical Council may be informed about the same to take necessary action against the doctor.

CONCLUSION

Previously we had also observed similar case of incomplete post mortem performed by M.B.B.S. doctors. No action has been taken despite of meticulous examination, photography and reporting to the higher authorities. Similar case was recently performed by one of the professor of Tamilnadu who had confessed in front of the Media that he had conducted incomplete postmortem because there was too much pressure from the public and he wants early dispose off.

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SUICIDAL CUT THROAT - A CASE REPORT

Dr. Fremingston K. Marak, Junior Resident,

Dr. Th. Bijoy Singh, Asst. Professor,

Regional Institute of Medical Sciences,Imphal, Manipur, 795004.

ABSTRACT

Cut throat is not a very common method preferred for committing suicide. Homicidal cut throat is more commonly seen in our country. The common methods used for committing suicide in our country are hanging, consumption of poison, burns, jumping from height, drowning, firearms, stabbing etc. Suicidal incised wounds are found most commonly in the neck and is usually associated with hesitational cut wounds. This paper is presented due to its rarity.

Key Words : Suicide, cut throat, depression.

INTRODUCTION

Suicide is defined as death due to an intentional act or acts of the deceased who anticipates his or her resultant death[1]. Suicide is the "taking of one's own life"[2]. It is taken from the Latin word where "Sui" means "of himself" and "caedere" means "to kill". Mental illness constituted a major cause of suicide, followed by domestic conflicts. Cultural and religious factor continued to play an important role in suicidal behaviour in India. Ethnically, rate among Hindus was higher than among Christians[3]. Association between suicide and hopelessness was stronger and more stable than the association with depression and substance use disorder[4].

CASE REPORT

On 30-07-2004 at about 8:30 am, it was informed to the Police that a dead body was found lying dead on a bed with pool of blood at North AOC, Kekru village. As it was a UD case, the Police conducted the Inquest and brought the dead body to RIMS Mortuary for Post Mortem Examination.

On examination, the deceased was of normal physique, good nutritional status, normal posture, wearing a stripped blue and white T-shirt, semi-clotted blood was present on the right side of the chest and also on the backside with mud, One satin track pant with blood stain on the right side, One blood stained suspender, One black thread on the right upper arm with a metallic talisman. Generalised pallor of the body was present, the eyes and mouth were closed, right hand was clenched, dried blood stain was present on the right upper limb at different places from the deltoid to the palm, rigor mortis was present all over the body, postmortem staining was feebly present on the face, front of the chest and abdomen and fixed, postmortem insect bites were present on the left eyelids and around the eyebrows.

External injuries were as follows

(1) One incised wound on the left side of the neck obliquely placed, extending from the level of the mastoid up to the lateral border of the thyroid cartilage on the right side, elliptical in shaped, measuring 14 x 3.5 cms in size, with red clean cut margins involving right neck muscles, vessels and thyroid cartilage.

(2) Two parallel obliquely placed subcutaneous deep incised wound (hesitation marks) was present on the right side neck, situated 3 cms below the angle of the mandible, measuring 8 cm in length and 0.2 mm in width with clean cut margins. Tailing of the wound present anteriorly.

On internal examination the injuries were as follows:

The sternomastoid muscle, jugular vein were cut on the left side, the thyroid cartilage was partially cut on both sides.

Weight of the brain was 1100 gms, Right lung was 280 gms, Left lung was 260 gms, Heart was 260 gms, Liver was 1000 gms, Spleen was 80 gms, Right Kidney was 140 gms, Left Kidney was 140 gms, around 300 cc of semi-digested food materials were present on the stomach and faecal matters

were present in the intestines.

Death was opined as due to haemorrhagic shock resulting from incised wound on the neck produced by sharp weapon. Suicidal in nature. Time since death was given as 12-18 hours (approximately) at the time of autopsy. Injuries were antemortem in nature and fresh at the time of death.

DISCUSSION

Under Section 306 IPC, if any person commits suicide, whoever abets the commission of such suicide, shall be punished with imprisonment of either description for a term, which may extend to ten years, and shall be liable to fine. Under Section 309 IPC, whoever attempts to commit suicide and does any act towards the commission of such offence, shall be punished with simple imprisonment for a term, which may extend to one year or with fine or with both[5]. Suicide is a problem with many facets from the psychiatric and psychological point of view on one hand and to the mechanic of the mode of death on the other. For every suicide there is a far larger number of attempted suicides and suicidal gesture, so that the successful suicides are merely the tip of the proverbial iceberg. According to WHO estimate, approximately 8,14,000 people died by suicide in the year 2000. In the past 45 years suicide rates have increased by 60% in some countries and suicide is now one of the three leading causes of death among those aged 15 - 34 years worldwide. This data clearly indicate that suicide is a serious public health problem[6]. In the present case study the victim was a 28-year-old male with a history of depression for the last few years. Suicidal deaths are attracting increasingly more attention from the medical professional and public health agencies. The common methods used for committing suicide in our country are hanging, consumption of poison, burns, jumping from height, drowning, firearms, stabbing etc. The choice of method used to commit suicide depends upon the availability of means, knowledge about lethal effectiveness and the victims' motivation and intent[7]. Regardless to any real or suspected trend, suicide is a public health problem by virtue of the present incidence[8]. Agnihotri AK[9] stated that incised wounds are usually suicidal while chopped wounds (i.e. type of incised wound) and stab wounds are usually homicidal. They found the stab wound to be more common compared to cut throat in males as well as females. Suicidal incised wounds were found most commonly in the neck and wrist. The hesitation marks, which were superficial, were associated with the main wound in the neck region. The suicidal victims were found dead in their home. Injuries on the back and genitalia were uncommon in suicidals. According to Karisson T[10] stab wounds on the chest (horizontal) were commonest cause of suicide followed by cut in the wrist. According to his study, irrespective of sex, majority of both suicide and homicides took pace in the victim's home. In this present case the suicidal victim was found dead in his home with an incised wound in the neck and associated with hesitational wounds.

CONCLUSION

Cut throat is not the commonly preferred method for committing suicide. Homicidal cut throat injuries are more commonly found in others studies. The gravity of the situation that makes a person to commit suicide need to be dealt with and medical help should be provided once the person shows any symptoms and signs of suicidal tendency. Attempts should be made to reach out to this individuals and proper counseling should be done so as to enable them to cope with the situation. The public should also be made aware of Section 306 and 309 IPC; because abetment of suicide is punishable under Sec. 306 IPC for a term, which may extend to 10 years and attempt to commit suicide is punishable under Sec. 309 IPC5 for a term, which may extend to 1 year, with fine or with both. The purpose of psychological autopsy are to identify factors that contributed to suicides, helps professional who work with suicidal client, prevent suicide in future and supplement findings on physical autopsy.

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DELAYED DEATH IN A CASE OF ATTEMPTED STRANGULATION MECHANISM OF CEREBRAL THROMBOSIS AND INFARCTION -A CASE REPORT

Dr. D.S. Badkur, Joint Director, Medico legal institute,

Dr. Arneet Arorae, Associate Professor,

Dr. C.S. Jain, Junior Forensic Specialist

Department of Forensic Medicine Gandhi Medical College, Bhopal Madhya Pradesh PIN -46200 I.

ABSTRACT

Throttling is usually a homicidal act and generally the assailant continues the compression until the victim is dead. Pressure applied on the neck for about 3 -4 minutes consistently or more, is considered to be sufficient to cause death; the survival time depending upon the degree and duration of compression of the neck. The death may either be instantaneous or may be delayed for a few hours to a few days but in rare circumstances, the victim may survive, if rescue measures and treatment are promptly instituted. One such case of a male aged about 60 years, who was hospitalized after attempted manual strangulation for about 19 days and died thereafter, is being discussed. Medico legal autopsy findings of such a case are being evaluated in the light of existing literature.

Key Words : Strangulation, Cerebral Thrombosis.

CASE REPORT

A 60 years old man residing in a village was assaulted late in the night, at his home when sleeping, by some unknown assailants. The assailants attempted to strangulate him manually, when his wife who was sleeping in the courtyard rushed in on hearing the commotion. The assailants then ran out and she found her husband lyin unconscious on the floor. She immediately arranged for him to be taken to the hospital nearby, from where he was referred to Hamidia Hospital, Bhopal. He was unconscious, had raised blood pressure (170/100) and increased secretions, although no dyspnoea, stridor or cyanosis was seen. He was admitted in the surgical ward and investigated. Fracture of the spine of seventh cervical vertebra was reported on x-ray examination of the neck. The CT scan of the head demonstrated large, bilateral, hyper-densities occupying both right and left parieto-occipital lobes. The right parieto-occipital lesion had caused midline shift with compression of the right lateral ventricle. Right Sylvian fissure was effaced and the final impression was that of large infarcts. On receiving a reference call from the surgical ward, the patient was examined by one of the authors about a week after the incidence, when about ten abrasions were still seen clearly on the lower part of the face and on the anterior aspect of the neck. Some of the abrasions were linear and a few somewhat rectangular, varying in size from 0.5 cm to 3x2.5cm. Most of the abrasions were tapering laterally, consistent with abrasions produced by nails. Some of the abrasions were scabbed, with the scab retracted to varying degrees and at places the scab had fallen off partly leaving a hypo-pigmented area. No contusion could be appreciated externally due to the dark complexion. Later on, a cervical collar was placed around the neck and tracheostomy was instituted. The patient died 19 days after the assault and a medico-legal autopsy was conducted by one of the authors. The autopsy examination confirmed the fracture of the spine of the seventh cervical vertebra. Lateral tapering of the abrasions on the neck was still evident and on dissection of the neck, red tinged yellowish effused blood was observed in the subcutaneous tissue in resorption phase. Brain was observed to be soft and edematous with edema being more marked on the left side; the cut surface revealed softening and liquefaction in the parieto-occipital lobes. Marked atheromatous changes of grade II to IV in the vessels of Circle of Willis including the middle

cerebral artery and at places in branches of anterior and posterior cerebellar arteries was observed. There was thrombosis over the atheromatous lesions at places causing almost complete occlusion of vessels. Internal and external carotid arteries also showed marked atherosclerotic changes. Grade II atherosclerotic lesions were present in aorta and coronaries showed about 30-40% occlusion at places. Right kidney had a cyst of 1 cm diameter. Other organs were normal and healthy. The cause of death was stated to be brain damage (cerebral infarction) resulting from occlusion of cerebral vessels, as a sequel to attempted throttling.

DISCUSSION

In the present case, the victim of manual strangulation was an elderly male, aged about 60 years where the age related pathological changes had contributed partly to the unusual sequence of events. The fracture of the spine of seventh cervical vertebra and the presence of ecchymosis and abrasions on the anterior aspect of the neck, indicate compression of the neck from the antero-lateral aspect by the assailants against a firm surface posteriorly. Injury to the cervical spine can be caused by multiple forces of flexion, extension, lateral rotation, axial loading or a combination of these [1,2]. In the present case, osteoporotic changes could have served as an additional factor in causation of fracture of cervical spine. In addition to these factors, the reaction and defensive movements of the victim could have further caused antero-posterior and/or side to side compression of neck and in association with violent jerking movements in multiple directions, may further facilitate the fracture of spine. The mechanism of death operating in a case of throttling is believed to be either one or more of the following [3].

1. Occlusion of the windpipe.
2. Obstruction of the venous return -stagnation of the blood causing anoxia in the brain.
3. The blood supply to the brain is cut-off by pressure on the carotid vessels -this seems to be unlikely as it is mechanically difficult to achieve the necessary compression through the tissues and also, an alternative blood supply to the brain is available through the vertebral arteries.
4. Vagal inhibition of the heart -the carotid plexus in the neck is particularly sensitive and pressure at this point may well be the predominant cause of sudden death.

In accordance with the above mentioned mechanism(s) of death, a case of strangulation associated with delayed death is rare but not improbable and a few case reports of the same are seen in the literature. The mechanism of death has not been well established in such cases. Anscombe and Knight (1996) have analyzed the various theories. In a case of attempted strangulation seen by them with survival time of 7 days, the authors were convinced that that the cause of death was hypoxic brain damage, although they have not mentioned any gross pathological lesion or any specific histopathological finding. Deprivation of oxygenated blood supply to the brain for 4 minutes leads to irreversible brain damage - that it could be caused by carotid artery compression and / or airway occlusion also seemed to be extremely unlikely. Further, it is not established that complete bilateral carotid artery occlusion can lead to irreversible brain damage and whether in such a circumstance sufficient blood supply can be provided through the vertebro-basilar system; besides, the fact that vertebral artery can be occluded by strangulation, seems to be unusual in routine circumstances, as it traverses mainly within a bony tunnel [4].

Anscombe and Knight (1996) have thus postulated that transient manual pressure upon the baro-receptors in the carotid sinuses and carotid sheaths can cause a reflex cardiac arrest. This triggered the afferent stimuli via the glossopharyngeal nerves to the brain stem and the reflex cardio-inhibitory impulses via the tenth cranial nerve nucleus and vagus nerves to the heart.

Case reports of death being delayed for 7 and 14 days respectively after attempt at hanging have also been cited by Harish D.et al (1992). The cause of death in these cases was certified as either hypoxic brain damage or a combined effect of cerebral damage due to cerebral ischemia and bilateral consolidation of the lungs respectively [5].

In the present case, the deceased was an elderly individual where age related changes in the bones and blood vessels were obvious. Osteoporosis in the cervical vertebrae and other

bones and atherosclerotic changes in the blood vessels of neck and the arteries in the Circle of Willis were apparent. In addition to the pathological changes, the injuries on the neck were sufficient to suggest attempt of manual strangulation. Thus, at the outset, the case poses a dilemma regarding the manner of death, whether natural or homicidal. The deceased also survived for a period of about 19 days after the attempt of throttling due to hypoxic brain damage. The pathophysiology of cerebral infarction in this case and the interaction and contribution of natural pathological process and the force associated with strangulation has been postulated (Fig. No.1). It is proposed that violent compression of the neck in the presence of the age related pathology, i.e. atherosclerotic lesion in the vessels, predisposes them for thrombus

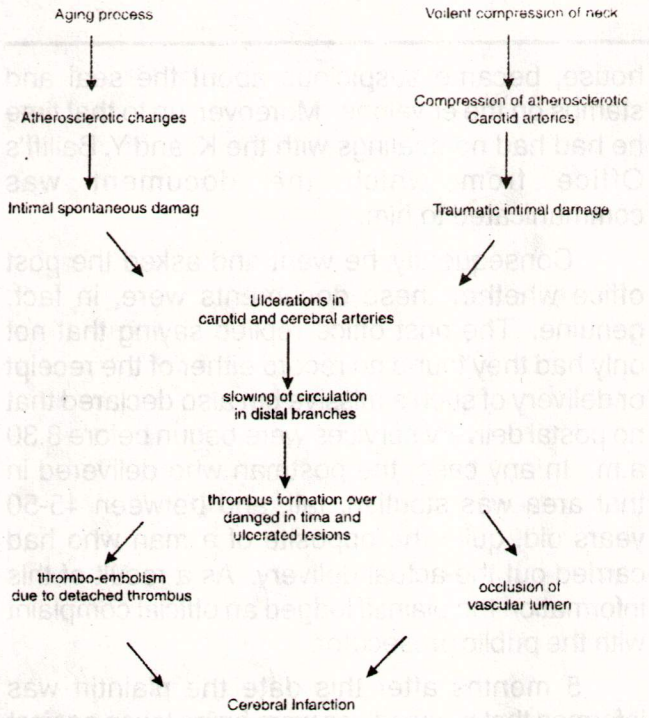

Fig. No. 1 . Pathophysiology of cerebral infration on strangulation in an elderly person

formation. This leads to almost complete occlusion of vessels particularly middle cerebral arteries and its branches causing formation of infarcts. The localizedinfarction in the brain indicates that the hypoxic brain damage was a consequence to impaired blood supply to the part and the extended survival time can be attributed mainly to sparing of the vital centers in the brain, as generalized hypoxia could not be maintained for a long duration to affect these centers. Legally, in accordance with the Indian Law, there were no controversies regarding the manner of death, which was regarded as homicidal in spite of the existing pathology and the extended survival time, under section 300 of Indian Penal Code. The burden of proving a certain intent or knowledge in a case of homicide rests on the prosecution, which in this case was apparent by the injuries on the neck.

Section 300 IPC -Murder-

Firstly: Culpable homicide is murder, if the act by which the death is caused is done with the intention of causing death, or

Secondly: if it is done with the intention of causing such bodily injury as the offender knows to be likely to cause the death of the person, to whom the harm is caused. or

Thirdly: if it is done with the intention of causing bodily injury to any person and the bodily injury intended to be inflicted is sufficient in the ordinary course of nature to cause death, or

Fourthly: if the person committing the act knows that it is so imminently dangerous that it must in all probability cause death or such bodily injury as is likely to cause death and commits such act without any excuse for incurring the risk of causing death or such injury as aforesaid.

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PROMISSORY NOTE FRAUD:A CASE REPORT

Asicioglu Faruk, Associate Professor,
Chairman, 5th Committee, The Council of Forensic Medicine of Turkey, Ministry of Justice, Istanbul
E.mail:fasicioglu@hotmail.com

ABSTRACT

This article has been written about an extremely successful case which is interesting and instructive both from the point of view of the methods used and also from the way in which it was detected.

In the case, a man dressed in official postman's uniform with a bunch of letters in his hand came to the house of the plaintiff and made him sign some documents as saying these are official directives from the Bailiff's Office.

5 months after this date the plaintiff was informed that proceedings were being taken against him on the part of the Bailiff's Court on account of two promissory notes.

Key Words: Fraudulence, signature, promissory note.

INTRODUCTION

With the constant increase in fraud, the questioned document examiners are in ever-growing demand for their experience and expertise in combating the more sophisticated ways of fraud. One of these ways is to give the appearance of a printed promissory note to a blank or previously completed from which had been given a signature for another purpose [1-3].

The province of Ege (the Aegean), an area in our country in which trade and industry has been developed, is a place where this method is used in a considerable number of cases. This article has been written about an extremely successful case which is interesting and instructive both from the point of view of the methods used and also from the way in which it was detected.

CASE REPORT

On 18.12.1996, at 8.15 a.m. a man aged between 25 and 30, slight in build and about 165-170 cms in height, dressed in official postman's uniform with a bunch of letters in his hand came to the house of the plaintiff. The plaintiff was awoken by the sound of the doorbell and the postman explained that he had brought an official directive from the Bailiff's Office and gave him three documents one after the other which required his signature. The plaintiff took the envelope surrendered to him but, on going back into the house, became suspicious about the seal and stamps on the envelope. Moreover, up to that time he had had no dealings with the K. and Y. Bailiff's Office from which the document was communicated to him.

Consequently, he went and asked the post office whether these documents were, in fact, genuine. The post office replied saying that not only had they found no record either of the receipt or delivery of such a missive but also declared that no postal delivery services were begun before 8.30 a.m. In any case, the postman who delivered in that area was stoutish, tall, and between 45-50 years old, quite the opposite of a man who had carried out the actual delivery. As a result of this information the plaintiff lodged an official complaint with the public prosecutor.

5 months after this date the plaintiff was informed that proceedings were being taken against him on the part of the H. bailiff's court on account of two promissory notes from the clearing bank which bore his signature, one for 1.500.000.000 TL and the other for 125.000.000 TL. A case had previously been opened for the eviction against the holder of this promissory note, A.B who was the tenant of the plaintiff, C.D.

In the light of this the plaintiff opened a case claiming that the two events were related and that official documents had been forged and false documents used. In the course of the proceedings

it was understood that the apparent debtor was a fictitious person, Mehmet Çöpten. Moreover, two witnesses came forward to testify that they had heard A.B. say, "I will ruin C.D and I have the documents to do so". Also, A.B was unable to give a satisfactory answer to the question as to what business dealings with C.D. In consequence of this, the court sent the file to our laboratory for examination in order to find out the answers to the following questions:

1.Was the name "C.D." written on the back of the promissory notes and the endorsement signature in C.D's own handwriting?

2.Could the pieces of paper used as promissory notes have been used in any way previously as printed forms in order to obtain the signature of the plaintiff?

3.Had the promissory notes been tampered with in any way, physical or chemical?

4.In whose handwriting were the signatures and the text?

5.If false, was this promissory note of such a quality as to succeed in deceiving the recipient?

RESULTS

It was concluded that the name "C.D" written on the back of both the promissory notes as well as the endorsement signature were all in C.D's own handwriting but that on the front of the note was not written by the suspect A.B. However, the aforementioned promissory notes revealad the following:

1.Each displayed irregular perforation along the edges -had not been cut in a printshop.

2.Although there was an interval of 6 months between the issue of the two notes it was observed that they had been written with the same kind of pen [1].

3.The writing and the figures on the front of the promissory note for the sum of 1.500.000.000 TL and the writing and the figures on the payment request received by the plaintiff 5 months previously, as well as those on the front of the envelope containing the directive, were by the same hand.

4.Although no chemical alteration in the promissory notes themselves was detected, the writing underneath the stamp on the back of the promissory note for 125.000.000 TL had been erased by mechanical means and traces of the former writing could be read, including the name and surname of the recipient as well as those of the person who delivered them [2, 4-6].

5.The endorsement signature of C.D. written on the back of each promissory note was not written in the usual place for such signatures .

6.On examination of the position of the writing and figures on the front of the promissory note and their pressure embossments intersecting with the name and signature of C.D. on the back of the note , it was concluded that as the writing on front of the note and their pressure embossments had displaced the writing on the back of the note and their pressure embossments in other words, as the name of C.D and the endorsement signature had been written before the writing on the front of note [7,8].

CONCLUSION

The evaluation of all the observations made above shows that the promissory note had been signed by C.D for another purpose and that the reverse of the document had been changed in order to make it look like a promissory note. It was concluded that it was in this way that C. D had been made to seem the endorser of the promissory note.

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COST OF MEDICAL TREATMENT TRIGGERING HOMICIDE ON ATTEMPTED SUICIDE

Dr. Shilekh Mittal, Junior Resident
Dr. Navpreet Kaur, Junior Resident
Dr. Gurmanjit Rai, Senior Lecturer.
Dr. Ashok Chanana, Associate Professor,
Dr. Hakumat Rai, Additional Professor,
Dr. J.S. Dalal, Professor & Head
Deptt. of Forensic Medicine, Govt. Medical College, Amritsar

ABSTRACT

Modern science has opened lot of venues to save the precious lives. The media is responsible for wide spread acquaintance of these developments even to the economically down trodden. These highly advanced methods of intensive care are definitely very costly are beyond the reach of even a middle class family but this notion do not immediately restrict anybody from obtaining such kind of aids.

Key Words: Cost of medical treatment, suicide

A unique case of such kind, where allegation of abetted suicide for demand of dowry was reported. The lady hanged herself but was immediately rescued from the ligature, suffered hypoxic encephalopathy and remained under treatment from 8/9/2004 to 19/12/2004 but suddenly she died after remarkable recovery and the allegation was reaffirmed by the parents to be suspected foul play in the death of the lady.

Autopsy was conducted on 25/12/2004 and following observations were made: -

Dead Body of female, 5'-2" long, poorly built and poorly nourished. The abdomen was scaphoid and limbs were wasted, eyes and mouth semi open. Eyes balls were sunken, nails showed cyanosis. An old healed scar was present on the front of the neck just below thyroid cartilage. Bed sore was present in the sacral region, rigor mortis present all over the body, postmortem staining present over the back sparing the area of contact flattening. Visible deformity and swelling present at the left elbow joint. On dissection myositis ossifican present in the flexor muscles.

On dissection of neck: - on reflection of skin & platysma white glistening fibrous tissue present on front of trachea, which was seen, with the help of hand lens. White glistening band was also present on the ribbon muscles and sternocleidomastoid both sides. Healed tracheostomy wound, with missing 3rd and 4th ring and brownish black discoloration of the mucosa of trachea and larynx was revealed.

On dissection of skull:- on opening the cranial cavity membranes were shriveled covering the brain. Brain showed atrophy, the sulci were flattened and gyri were narrowed, fibrinous exudates present on the right & left parietal lobes on the pre central gyri. The weight of brain was 1103 gm. Brownish discoloration of cortical region with granular appearance and firm feeling while cutting indicating gliosis was reveled, cortical thickness was slightly reduced ventricular system was dilated, CSF increased in quantity.

On dissection of Thorax; lungs showed congestion.

On dissection of Abdominal cavity

Stomach contains 70 ml of brownish black fluid, mucosal and sub mucosal hemorrhages were present mesentery was transparent. All other organs showed atrophy and mild congestion, organ of generation was healthy.

Viscera were send to chemical examiner on the basis of finding in the GIT. The chemical examiner report revealed organophosphorous compound pesticide poisoning. The cause of death by board of doctors was declared, asphyxia as

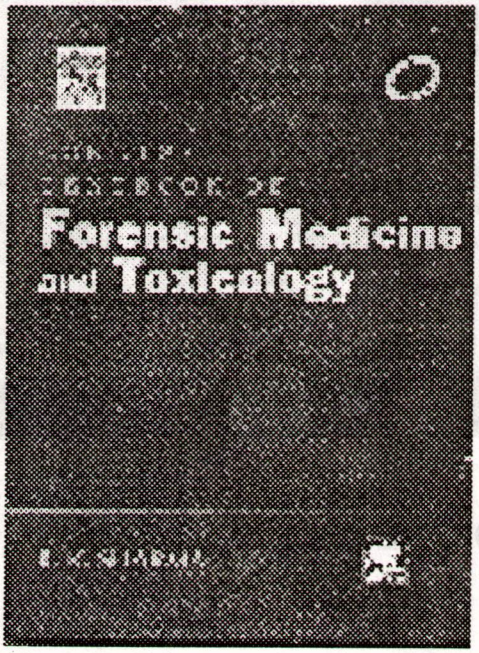
result of organophosphorous poisoning.

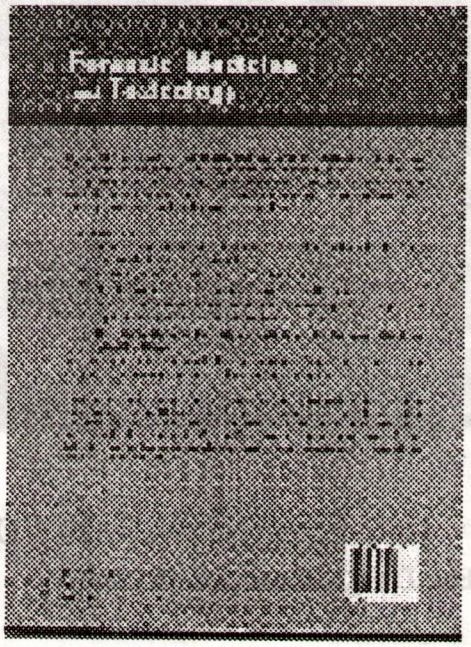
DISCUSSION

On autopsy old scars and damage due to hypoxic encephalopathy due to hanging was confirming the attempt to commit suicide under alleged dowry demand. The hospital record of different hospital under which she was under treatment is very good example of management of hypoxic encephalopathy with all the possible latest modalities though the patient did not recover fully but was alive for considerable period. This treatment amounted expenditure of many lacs, which ultimately triggered mischievous homicidal poisoning leading on to death in the house of the lady.

Another factor which could have precipitated attempted death could be irrecoverable state of the patient to normalcy and proper future life or the people nursing this patient might be thinking to eliminate as the matter has become chronic and winning the sympathy of the parents that they have properly treated this female and now no body can doubt about their motive which might be remarriage or resettlement of the husband. So it is a unique type of case in which the initial attempted suicide trigged and became the homicidal death. All the medical evidences they confirm the manner of death in this case and there is definitely background of malafied intention as alleged by the parents. Case yet not decided by the court.

BOOK REVIEW





Concise Textbook of Forensic Medicine and Toxicology

By: Dr. RK Sharma

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Prof. R.K.Gorea

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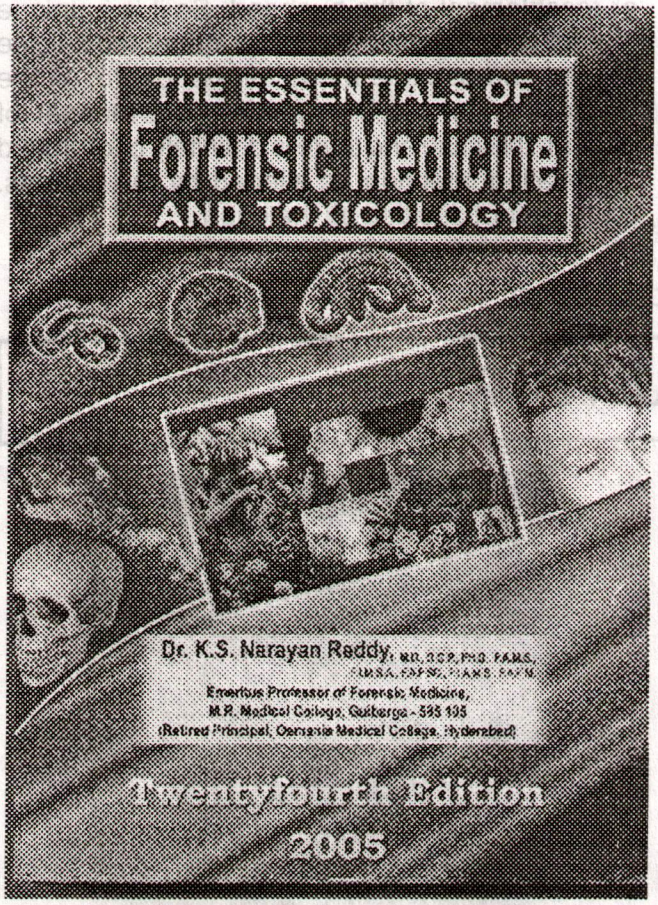
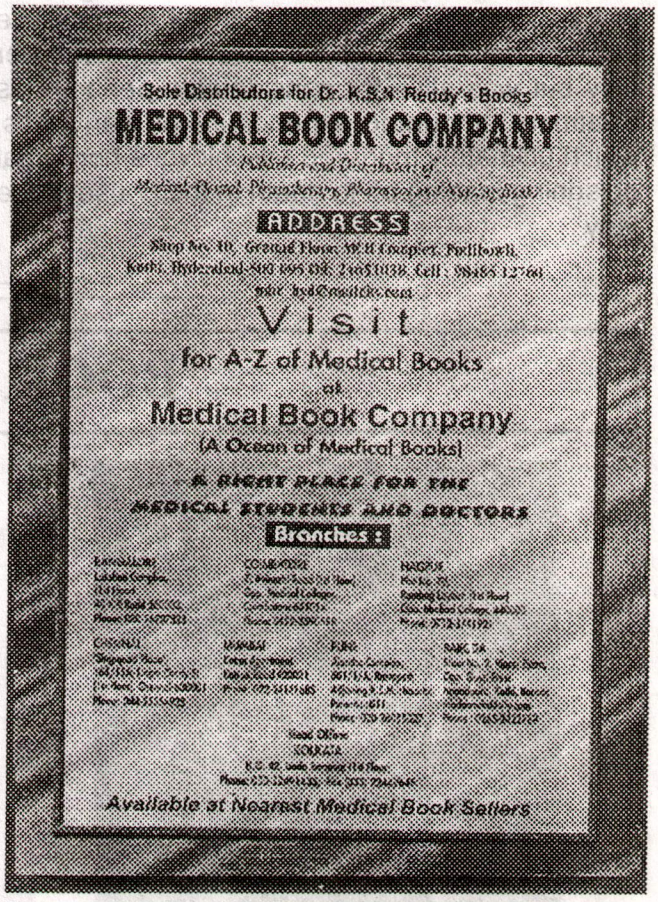
BOOK REVIEW





THE ESSENTIALS OF FORENSIC MEDICINE AND TOXICOLOGY

By: Dr. KS Narayan Reddy

This is a book, which has a lot of information on the subject of forensic medicine and toxicology. It has covered the subject in a very detailed and exhaustive manner. This book will be of immense help to the students and practitioners of forensic medicine. New topics like brain finger printing, ear prints enhance the value of the book. Practical approach in dealing with the topics makes it more valuable to all concerned.

Prof. R.K.Gorea

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