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Study of Fatal Road Traffic Accidents in North Karnataka

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ABSTRACT

Aims & Objectives: The study had carried out to know the various epidemiological, medico legal aspects of vehicular accidents in Bidar district population, making an attempt to establish various causative factors, pattern and distribution of injuries and thereby to plan preventive measures against it. **Material & Method:** All the cases of road traffic accident brought to the department for medico legal postmortem examination during the period from 1st January 2008 to 31st December 2009 were the subjects of the study. Information regarding date, time and place of incident age and related information was gathered from detailed history taken from the relatives of deceased and from the Police inquest. **Results: Total** 860 postmortem had been conducted, out of which 120 cases of road traffic accidents. The maximum victims were male (Male : female ratio 9:1) and were in age group of 30-44years. Among the presence of injuries abrasion were present in maximum number of victims 102 (85%) followed by the Palpable fractures in 82 (68.33%) victims. Maximum had injuries over head region i.e. 81(67.50%). The maximum number of deaths occurred during in winter season and were pedestrians.

Key words: Road traffic injuries, head injury, vehicular accident and pedestrians.

INTRODUCTION

The term accident has been defined as an occurrence in the sequence of events which "Usually produces unintended injury or death or property damage" [1]. Accident is an event, occurring suddenly, unexpectedly and inadvertently under unforeseen circumstances. In developed countries, RTA is the most common cause of death below the age of 50 years. Amongst all traffic accidents, RTA claims largest toll of human life and tend to be the most serious problem world over. Worldwide, the number of people killed in RTA is almost 1.2 million each year, while the number of injured could be as high as 50 million [2]. In India, over 80,000 persons die in the traffic crashes annually and over 1.2 million get injured seriously and about 300,000 get disabled permanently. In India, for individuals more than 4 years of age, more life years are lost due to RTA than due to cardiovascular diseases or neoplasm[3,4]. The problem appears to be increasing rapidly in developing countries[5].

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Currently motor vehicle accidents rank 9th in order of disease burden and are projected to be ranked third in the year 2020. Injuries due to RTA depend upon a number of factors, whether the victim is a pedestrian, a motorcyclist, a pedal-cyclist or 3/4 wheelers. Vehicle and environmental factors play vital roles before, during and after a serious RTA. The important factors are human errors, driver fatigue, poor traffic sense, mechanical fault of vehicle, speeding and overtaking, violation of traffic rules, poor road conditions, traffic congestion, road encroachment etc out of which most of them are preventable. Studies done by WHO shows that road accidents accounts for 2.5% of total deaths in India and in age group of 5-44 years, it is as high as 10% and is among six leading causes of death[2].

The present study has been carried out regarding the various epidemiological, medico legal aspects of vehicular accidents in Bidar district population, making an attempt to establish various causative factors, pattern and distribution of injuries and thereby to plan preventive measures against it.

MATERIALS AND METHODS

The present prospective study was conducted in the department of Forensic Medicine, Bidar Institute of Medical Sciences and Teaching Hospital Bidar, during the period from 1st January 2008 to 31st December 2009. All the cases of road traffic accident brought to the department for medico legal postmortem examination were the subjects of the study. Information regarding date, time and place of incident age and related information was gathered from detailed history taken from the relatives of deceased and from the Police papers.

OBSERVATION

It was observed that out of 860 cases received for postmortem examination at our department, and 120 (13.95%) cases were road traffic accident.

Table 1: Sex wise distribution

Sex	Number of cases	Percentage
Male	108	90%
Female	12	10%
Total	**120**	**100%**

The findings of study revealed that 108 (90%) subjects under the study were male and 12 (10%) were female. The male and female ratio was approximately a ratio of 9:1(table-1).

Table 2: Age and sex wise distribution of the persons

Age group	Female	Male	Total	percentage
0-14 years	2	7	9	7.5%
15-29 years	3	34	37	30.83%
30-44 years	4	41	45	37.50%
45-59 years	2	20	22	18.33%
60-80 years	1	6	7	5.83%
Total	12	108	120	100%

Age wise distribution of the cases is divided into five groups as per WHO guidelines. It is observed that maximum number of cases is found in age group of 30-44years and minimum number of cases is found in the age group of 60-80 years, having more male victims in a age group (Table-2).

Table 3: Seasonal distribution of cases

Season	No. of Cases	Percentage
Winter	48	40.00
Monsoon	43	35.83
Summer	29	24.17
Total	**120**	**100**

It is observed that in winter season (from November to February months) there were 48 (40.00%) deaths, in Monsoon season (from July to October months) 43 (35.83%) deaths and in summer season (from March to June) 29 (24.17%) deaths occurred. That is the maximum number of deaths occurred are in winter season (Table-3).

Table 4: Distribution as per road users

Type of Road users	No. of persons	Percentage
Pedestrian	49	40.83
Cyclist	9	7.50
Motorcyclist	48	40.00
3 or 4 wheeler	14	11.66
Total	**120**	**100**

We have observed that the persons died due to RTA were of four types. Out of 120 persons maximum 49(40.83%) were pedestrian, followed by motorcyclist 48 (40.00%) and only 9(7.50%) were cyclist (Table-4).

Table 5: Distribution of cases according to type of victims and injuries

Type of victim	Type of injury					
	Abrasion	Contusion	Laceration	Incised wound	Stab wound	fracture
Pedestrian(49)	42	17	23	1	0	33
Cyclist(9)	6	5	6	0	0	6
Motorcyclist(48)	40	29	26	0	0	35
3or4wheeler(14)	14	8	7	1	0	8
Total (120)	**102 (85%)**	**59 (49.16%)**	**62 (51.66%)**	**2 (1.66%)**	**0**	**82 (68.33%)**

We have distributed the presence of external injuries according to type of victims. The external injuries were seen abrasions, contusions, lacerations, incised wound, palpable fractures in persons died due to RTA. Among the presence of injuries abrasion were present in maximum number of victims 102 (85%) and the Palpable fractures were present in 82 (68.33%) victims (Table-5).

Table 6: Type of victim and body region injured

Type of victim	Injuries present over body region						
	Head	Face	Neck	Chest	Abdomen	Upper limb	Lower limb
Pedestrian (49)	38	9	2	14	6	8	16
Cyclist (9)	6	4	1	3	2	4	3
Motorcyclist (48)	34	10	2	18	9	18	16
3 or 4 wheeler(14)	3	1	1	5	2	3	2
Total (120)	**81 (67.5%)**	**24 (20%)**	**6 (5%)**	**40 (33.33%)**	**19 (15.83%)**	**33 (27.50%)**	**37 (30.83%)**

We have distributed the injuries according to the involvement of various body regions in relation to type of victim. Many persons had injuries over single, double or many body regions. Maximum number of victims had injuries over head region i.e. 81(67.50%). Only small number of victims had injuries over neck region 6(5%). Among the total victims, the motorcyclist had maximum injuries over head region that is 34(70.83%) out of 48 persons (Table-6).

Table 7: Distribution according to visceral Injuries

Visceral injuries	No.	Percentage
Brain	90	52.94
Heart	5	2.94
Lungs	44	25.88
Liver	10	5.88
Spleen	11	6.47
Kidney	3	1.76
Mesentery	5	2.94
Intestine	2	1.19
Others	-	-
Total	**170**	**100**

It is observed that many had injuries involving more than one visceral organ. Comparing the visceral injuries maximum had injuries involving brain that is 52.94% out of total visceral injuries and in relation to number of victims it is 47.06% (Table-7).

DISCUSSION

Road traffic accidents (RTAs) are increasing with rapid pace and presently these are one of the leading causes of death in developing countries. Vander sluis et. al [7] has reported that traffic is the most important cause of severe injuries and that three quarters of the severely injured cases, who died during hospitalization are victims of traffic accidents. The incidence of accidental death in India has shown a mixed trend during the decade 1996-2006 with an increase of 43 per cent in the year 2006 as compared to 1996. A total of 3,14,704 accidental death were reported in the country during 2006 (20,529 more than such deaths reported in 2005) showing an increase of 7.0 per cent as compared to previous year.

In the present study, a total of 120 cases of fatal road traffic accidents (RTAs) had been studied in respect to distribution, nature and type of injuries. A majority of victims of fatal RTAs had sustained multiple injuries. E. Ke N et. al.[8] had also reported the occurrence of multiple injuries in 93.5% of the victims. Singh & Dhattarwal [9] had also recorded involvement of multiple body parts in all cases. Abrasion, laceration, fractures, dislocation, head and visceral injuries were more commonly observed in fatal RTAs. In the present study, males is to female ratio was 9:1. This is near to ratio of 9:1 as has been observed by Singh and Dhatarwal [9] and by B.R.Sharma et al. in northern India who has observed majority of male victims (90%). Highest incidence of fatalities had occurred in the age group of 30-44 year (38.3%) followed by the age group 15-29 year(30%). Kochar et. al.[10] had reported that maximal fatal accidents had occurred in the age group of 31-40 years and a preponderance of males (85%) were seen. Whereas Singh and Dhattarwal [9] had observed that the commonest age group involved was 21-30 years (27.3%) followed by 31-40 years (20.6%). Pedestrians were mostly involved followed by

motorized 2 wheelers. Pedestrians being the common victims can be explained by the fact that there were a lack of proper footpath and presence of vendors and other commercial installations by the side of the roads. Moreover majority of road users were pedestrians, thus they were comparatively more exposed to the risk of accidents, and were of lower middle socioeconomic status, illiterate and lack traffic sense. Our findings are in general agreement with these observers [7, 8 & 9]. Multiple visceral injuries (internal injuries) were quite common following fatal RTA. Table-7 has depicted various visceral organs involved in the RTA. In majority of cases, brain had been chiefly injured followed by lungs, liver and spleen respectively. A higher incidence of brain injury had also been reported by other workers[7, 8, & 9]. Singh & Dhattarwal [9] who had reported the incidence of head injuries as 50.4%. Severe brain injury was the most important cause of death, was held by Vander sluis [7].

CONCLUSION

We have done total 860 postmortems, out of them 120 were due to road traffic accident (13.95%). It was observed that deaths due to RTAs were more in males than in females (9:1 ratio), & was more in younger age groups in Bidar district. From the data it was observed that maximum victims were pedestrians, and maximum had injuries on head region. Maximum no. of motorcyclist had injuries over head. Maximum deaths occurred in winter season.

In most of the cases, fatal RTAs were due to human errors and therefore it was preventable. Strict licensing policy especially for four wheelers, a greater awareness about traffic rules, cultivation of road traffic sense, curbing drug abuse, and a proper road network confirming to the volume of traffic will go a long way in curbing the incidence of fatal RTAs. Providing safe crossings and sidewalks or separate paths and lanes for pedestrians and cyclists, providing convenient and affordable and frequent public transportation, operating in safe conditions will reduce the occurrence of road traffic accidents. Helmets on all riders of bicycles, motorcycles and mopeds are to be made compulsory to prevent head injuries which are the one of the most likely to result in death or disability of riders[11]. Seat belts are to be made compulsory for all drivers and passengers of cars and other four wheelers. Providing appropriate and immediate first aid at the scene of accidents, appropriate medical care in emergency rooms and appropriate post emergency medical care and rehabilitation shall also reduce the death and disabilities.

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Eruption of 2nd molar in age 12-14 years: A Clinical Assessment in Rural Maharashtra

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ABSTRACT

Background: Dentition occurs in a well defined manner starting from age 6 months to 2 years with appearance of temporary teeth followed by appearance of permanent set of teeth from 5 to 25 years. Hence the assessment of chronology of appearance of various teeth is useful in age estimation. Age 12-14 years is of immense significance from forensic point of view. **Materials & methods:** The present study was under taken in the department of Periodontics, Rural Dental College, Loni, from 10th Jun 2009 to 3rd May 2010. The dentition was examined using Mouth Mirror, Probe and Torch. The individual data was filled in a predesigned proforma. Charting was done as per the ***Federation Dentaile Internationale*** system (F.D.I). Socioeconomic and dietary factors were also analyzed and their influence if any resulting in variation in the eruption of second molar was studied. **Results:** A total of 250 students studying in class 8th to 10th, of schools located in Loni and neighboring area of Pravara Nagar were assessed in the study, of which 142 were male and 108 were female. A correlation was found between the clinical eruption of 2nd molar and age.

Key words : Clinical eruption, Second Molar, Age estimation.

INTRODUCTION

Dentistry and Medico-legal work share a common interface where a dentist is approached at times for resolving numerous issues related to identification, age estimation etc. One of the important and frequent requirements posed to the medico-legal fraternity by the investigating authorities is to estimate age of a child, which holds great importance from the point of view of Criminal responsibility, kidnapping, consent, child labor etc [1-4].

The age estimation in these cases is usually carried out with the help of radiological assessment of various ossification centers, dental examination and physical examination.

Numerous studies have been carried out to assess the age of a young individual by assessment of eruption of teeth[5-10]. Regional variations due to nutritional, environmental, racial, genetic and numerous other factors exist. Emphasis by survey committee for generation of regional data

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corroborates it [11]. No data exists in this region of Maharashtra, hence the study was conducted to address the issue.

MATERIAL AND METHOD

The study was conducted during the period 10th Jun 2009 to 3rd May 2010 at the Department of Periodontics, Rural Dental College, Loni. The simple random sample of size 250, with 142 male and 108 female students was taken. The subjects were chosen amongst the students of class 8th to 10th of schools in Loni and the neighboring region of Pravara Nagar irrespective of their socioeconomic background. The purpose and method of study was explained to all and those consenting and meeting the inclusion criteria of being native of this region with valid proof of birth (Birth certificate/School documents), good oral hygiene, no developmental malformations and absence of any acute/chronic diseases were included in the study.

Table No 1. Age & Sex wise distribution of study subjects

Age group	Male		Female	
	Number	%	Number	%
12 - <13 years	76	30.4%	60	24%
13-14 years	66	26.4%	48	19.2%
Total	142	56.4%	108	43.2%

The subjects were divided into two groups as per the age. **Table No 1.**

Group I : Age 12 years to 12 years 364 days. (76 male/ 60 female)

Group II : Age 13 years to 13 years 364 days (66 male/48 female)

The dentition was examined using Mouth Mirror, Probe and Torch. The individual data was filled in a predesigned proforma. Charting was done as per the Federation Dentaile Internationale system (F.D.I). Socioeconomic and dietary factors were also analyzed and their influence if any resulting in variation in the eruption of second molar was studied.

The evaluation of tooth eruption was done as mentioned in the table below:-

S. No.	Stage	Characteristics
1.	'0'	Non-Eruption of temporary tooth/fall out of temporary tooth and non eruption of corresponding permanent tooth
2.	'1'	Tip of crown of tooth penetrated the gum margin
3.	'2'	Crown has grown into the oral cavity beyond gum margin but has not yet reached the occlusal plane
4.	'3'	Occlusal surface comes in contact with its counterpart and the bite is complete

The subjects were also classified after assessing their socio-economic status as per the Modified B.G. Prasad classification for the year 2008 [12]. The data generated was analyzed statistically and compared with other studies.

RESULT AND DISCUSSION

Evaluation of the data collected during the study revealed that a significant difference exists in the eruption of 2nd molar in both sexes, with

relatively early eruption in females. The reason for the same needs to be evaluated. Table No 2.

The findings are similar to those of studies conducted by Shourie[5], Kaul [6], Mishra [7], Agarwal [8],Carr [9] , Knot [10]. The mean age of eruption was relatively on the higher side in the present study, as compared to other studies as depicted in Table No 3.

Effect of nutrition and socio-economic status does exist. The socioeconomic demography of this rural area reveals that majority of the population belongs to Class II/ Class III as per the Modified B.G. Prasad classification and Consumer Price Index (2008). Those belonging to Class II had eruption of 2nd molar prior to those in Class III.

Table No 2. Second Molar Eruption Stages

Stage	Group I (12 - <13 years)				Group II (13-14 years)			
	Male (76)		Female (60)		Male (66)		Female (48)	
	Number	%	Number	%	Number	%	Number	%
	Rt Upper Jaw (17)							
'0'	40	52.63%	7	11.66%	8	12.12%	11	22.91%
'1'	8	10.52%	7	11.66%	0	00%	12	25%
'2'	10	13.15%	32	24.32%	54	81.81%	11	22.91%
'3'	18	23.68%	14	10.64%	4	06.06%	14	29.16%
	Lt Upper Jaw (27)							
'0'	44	57.89%	0	00%	9	13.63%	17	35.41%
'1'	0	00%	9	15%	0	00%	0	00%
'2'	16	21.05%	46	76.7%	48	72.72%	24	50%
'3'	16	21.05%	5	08.3%	9	13.63%	7	14.58%
	Lt Lower Jaw (37)							
'0'	30	39.47%	0	00%	0	00%	0	00%
'1'	14	18.42%	14	23.33%	1	01.51%	13	27.08%
'2'	16	21.05%	14	23.33%	23	34.84%	17	35.41%
'3'	16	21.05%	32	53.33%	42	63.63%	18	37.5%
	Rt Lower Jaw (47)							
'0'	25	32.89%	14	23.33%	0	00%	6	12.5%
'1'	12	15.79%	0	00	2	03.03%	7	14.58%
'2'	18	23.68%	22	36.66%	15	22.72%	5	10.41%
'3'	21	27.63%	24	40%	49	74.24%	30	62.5%

Table No 3. Comparison with other studies

Study	Maxillary				Mandibular			
	Male		Female		Male		Female	
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt
Shourie[5]	12.37	12.37	11.86	11.93	12.26	11.9	11.95	11.48
Kaul[6]	11.48		11.35		11		10.89	
Mishra[7]	12.66	12.1	11.68	11.78	11.83	11.37	11.47	11.48
Agarwal[8]	11.64	11.59	-	-	11.34	11.34	-	-
Carr[9]	12.1		11.7		12		11.4	
Knott[10]	11.9	11.9	11.9	11.9	11.6	11.5	11.2	11.2
Present study	13.4	13.2	12.10	12.11	13.2	13.2	12.10	12.10

CONCLUSION

The study leads us to the following significant conclusions. The eruption of 2nd Molar starts at age 12.10 years in females, and 13.2 years in males, i.e. earlier in females than in males. Very insignificant difference existed between the chronologies of appearance in both sides in either sex. However further studies are desirable to evaluate it further.

Appearance of 2nd molar by 14 years in most of the subjects helps in associating it with chronological assessment of age.

Variations which exist in respect to the other studies can be attributed to the restriction of sampling to age group 12-14 years.

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Determination of Personal Height from the Length of Head in Maharashtra Region

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ABSTRACT

Aims & Objective: In this study an attempt is made to find out correlation and to derive a regression formula between head length (glabella to inion) and total body height in Maharashtra region. **Material & Method:** The study is conducted on 406 medical and paramedical students from Maharashtra region. The age was in range of 17 to 22 years. The length of head is measured between the two fixed points i. e. between Glabella and Inion. To measure this length the spreading Vernier caliper was used. These measurements were done between fixed times to avoid the diurnal variation. The results obtained were analyzed and attempt was made to derive the formula between head length and total height of an individual. **Result:** The result from this study showed definite correlation between head length and height of an individual, in spite of racial and ethnical variation. **Conclusion:** The data from present work will be definitely useful not only for anatomist but also for anthropologist and also in forensic medicine and sciences.

Key Words: Regression formula, head length, total height, anthropologist.

INTRODUCTION

In point of the Anthropologist, the "height "parameter remains always in the center for various studies. To assess the height of an individual remains always interesting for various authors. It is calculated by measuring different parts of body. In many studies the relations (formula) have been find out between height and different long bones of human body. It will help us to find out the height of an unknown individual when only the few long bones are available. This point is very important not only for the Anatomist but also for the Dept. of Forensic medicine, where the analysis of medico legal cases has been carried out routinely to help police department.

In most of the Govt. medical colleges, always a help is taken by the police department from the department of anatomy and if required from department of Forensic medicine, in case where they get the suspected material of body parts i.e. muddemal (bones and masses of human body) in there areas. They use to send such muddemal to anatomy department of nearest Govt. medical college to find out any foul play behind it i. e. medicoleagal cases (M.L.C.). They always want to know whether these bones belong to human

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being or nor, the time since death, any possibility of poisoning, possible cause of death, possible sex of unknown individual, and the possible height of that individual. So this height parameter is important here to enable us to calculate it from any bone available. Because every time long bones will not be available

There are so many authors like Singh and Sohal[9] (1951), Singh and Shamen Singh[5](1956) charnalia[2] (1961) , Athawale [1](1963) , Patel et al (1964), Qamara et al[10](1979), Shroff and Vare [8](1979) have tried to find out formula for calculating the stature from long bones, but universally applicable formula has been not derived, as the relationship between long bones and height differs according to race, age, sex and side of body (Hardilka,1947)[4]. It is proved that each race required its own formula.

Estimation of height from length of head is also attracted by many authors like Saxena SK et al[7](1981) , but significant formula has been not derived. Also an attempt is made by Jadhav H R and Shah G.V.[11](2004) in Gujarati population to derive formula for their region.

Therefore an attempt is made to find out such formula to calculate height of an individual from the length of head in Maharashtrian population.

MATERIALS & METHODS

In the present study the parameters like "length of head" and "height" are considered. They were measured on 406 subjects (198 males and 208 females). The subjects were medical and paramedical students belonging to various regions of Maharashtra with having almost similar socio economic status. The age group of students ranges from 17 to 22 years. The measurements were taken at fixed time between 2 to 5 p.m. to eliminate the discrepancies due to diurnal variation. The head length was measured by spreading vernier caliper from glabella to inion (Hardlika[4]) and the height of individual is measured by height measuring instrument.

RESULTS

Four hundreds and six subjects comprised 198 males and 208 females were included for the study. They were age group ranges from 17 to 22 years. The value of measurement of "length of head" and "height" is depicted in the table-1. These Mean ,S.D. and S.E. are required to calculate the Correlation-Coefficient factors(r). All this is required statistically to derive regressive equation finally.

Table 1: Values of recorded observation

Parameters	Age(Years)	Head Length(cm)	Height(cm)
Range	17-22	15.3-20.4	140.5-190
Mean	18.70	17.92	163.29
S.D.	1.18	0.83	9.36
S.E.	0.05	0.04	0.46

The mean of height and length of head calculated as per Age of the cases. It is observed that maximum height in males belong to 18 years (171.98 cm) and female (159.35 cm) of aged 17 years while maximum length of head in males aged 22 years and in females aged 17 years (Table-II).

Table II: Age V/S height and head length

Age	Height mean (cm)		Head length mean(cm)	
	Male	Female	Male	Female
17	170.81	159.35	18.28	17.59
18	171.98	156.24	18.40	17.53
19	171.59	154.3	18.42	17.39
20	168.42	156.13	18.61	17.28
21	167.25	158.75	18.5	17.45
22	166	153.06	18.75	16.88

The table-III depicts the correlation-coefficient (r) values of various parameters. As data is available in this study we have made efforts to make correlation between possible parameters like age and height, age and head length, male and height, etc. Among the above correlations Height and Head length is most effective and significant statistically as value is more close to +1 (table-III).

Table III: Correlation–Coefficients (r)

Parameters	Coefficient value (r)
Mean Age and Height	-0.077
Mean Age and Head length	-0.015
Male and Height	-0.184
Female and height	-0.17
Sex and height	-0.175
Male and Head length	0.15
Female and Head length	-0.15
Sex and head length	0
Height and head length	+0.629

DISCUSSION

In the past many workers have done the work to assess the height from the length of different long bones. They have got successful correlation between the height and the length of head. But we came across very few references showing relations between height and length of skull. A study conducted by Saxena et al[7] (1981) in Agra population. There correlation coefficient between height and length of skull was +0.2048. But we did not get such references from Maharashtra region recently. So that, we have decided to carry out such work to derive formula for Maharashtrian population. The medical and paramedical students were selected as subjects for their easy availability.

Table no. I show that the age ranges from 17 to 22 years, head length from 15.3 cm to 20.4 cm and total height from 140.5 cm to 190 cm with a significant correlation between them.

The Table –II shows the correlation coefficients between various parameters. Between age and height, age and head length and between height and head length is positive suggesting that it is significant.

Various workers have shown significant correlation between height and different parts of body. Singh and Sohal[9] (1951), Jit and Singh[5] (1956) have shown a significant correlation between height and length of clavicle.

Charnalia[2] (1961) showed the significant correlation between height and foot length, where correlation was 0.46. Athwale[1] (1963), derived a regression equation between total height and forearm bones. In the findings of Patel et al (1964)[6] they have derived regression equation between tibia and total height in Gujarati population. Qamara et al[10](1979) conducted a study of height and foot length and derived a correlation coefficient for foot breadth (male 0.42 , female 0.47) and foot length (male 0.69 , 0.70), Shroff and Vare[8](1979) have also derived the height from the length of superior extremity and its segment.

But there are very few studies have conducted on relations between head length and height. We can come across two studies similar with this. One by Saxena et al[7] (1981) carried out in Agra population where they had derived correlation coefficient between height and head length was +0.2048. According to Glaister[3] (1957) nasion – inion length (head length) is 1/8 of the total height of an individual. The other study was carried out in Gujrat by Jadhav H.R. and Shah G.V.[11](2004), where correlation coefficient between height and head length was +0.53. From the present study data the formula is derived as under—

Regression Equation

For Male $Y = (58.15) + (6.11) X$

For Female $Y = (71.21) + (4.87) X$

For both Male and Female (Combined)

$$Y = (38.03) + 6.99 X$$

Where , Y = Total height

X = Head Length

So with the present study data the correlation - coefficient between the height and head length is + 0.62 , which is most significant.

SUMMARY & CONCLUSION

There are so many studies have conducted by workers to find out relation between height and different parts of body. Some of them have developed relation between height and foot length and derived formula to calculate height and some have worked to derive formula to assess the height from length of superior extremity. The relations between height and length of clavicle had also

developed. We have very few references indicating relations between length of skull and height hence we have carried out this work in Maharashtra region. In Medico-legal cases most of the times we will not get long bones to calculate the height of an unknown individual. To make the complete list of parameters we have made present study to derive formula to calculate height from length of head and a significant correlation coefficient between height and head length (glabella to inion) established. With this findings it is clear that by the measurement of either any (head length or total height) the other can be calculated and this fact may be of practically use in Medico legal cases (M.L.C.) investigations.

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We are very much thankful to our Deputy Director and Principal sir for giving permission to carry out this study in our college.(PDVVPF'S Medical College, Ahmednagar). Also we are thankful to our Statistian Mr. Lokhande for helping to calculate statistic analysis.

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Bilateral Variation in Various Indices of Femur

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ABSTRACT

Background: Physical Anthropology provides scientific method and technique for taking various measurements in different geographic regions and races. The femur itself is a complex anatomic unit so anthropometric study was devised on the same. **Aims & Objectives:** The study was aimed at determining measurements for obtaining Platymeric index, Robusticity index and Foraminal index for both right and left femur. **Material & Methods**: In the present study 106 (58 right and 48 left) intact adult femora were obtained from the bone bank of Anatomy Department of MGIMS, Sevagram. For this purpose a sliding caliper and osteometric board were used. **Results**: The Physiological Length of left femur came out to be 42.95 ± 1.67 cms and 42.69 ± 1.94 for right femur. Similarly Robusticity index was 14.44 ± 1.23 and 13.11 ± 0.93 for left and right femur respectively. The platymeric index for left and right femur came out to be 87.63 ± 7.34 and 86.49 ± 6.77 respectively. Whereas Foraminal index was between 33- 62% for left femur and between 31-61% for right femur when calculated from proximal end. Similarly number of nutrient foramina ranges from increasing frequency of single, double and triple foramina for left femur and in the increasing frequency of single, double and triple foramina per bone in right femur. **Conclusion:** Comparison of various indices in right and left femora has shown statistically insignificant but left one has shown higher values as compare to their right counterparts. The findings observed are of immense utility for medico legal experts. The details of data obtained with relevant review of literature will be discussed.

Keywords: Physical anthropology, Femur, Platymeric index, Robusticity index, Foraminal index, bilateral variation.

INTRODUCTION

Forensic medicine is an interdisciplinary science which in everyday practice applies all the knowledge that medical sciences and basic sciences, have accepted as reliable and scientifically solid facts or processes, and qualitative and quantitative definitions with the help of which accurate and reliable statements can be made. Anthropometry is a series of systematized measuring techniques that express quantitatively the dimensions of the human body and skeleton. It is often viewed as a traditional and perhaps the basic tool of biological anthropology, but it has a long tradition of use in forensic sciences and forensic medicine. The significance and importance of somatometry,

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cephalometry, craniometry and osteometry in the identification of human remains have been described and a new term of 'forensic anthropometry' is coined. The ultimate aim of using anthropometry and knowledge of human anatomy in forensic medicine/science is to help the law enforcement agencies in achieving 'personal identity' in case of unknown human remains.

By considering the importance of personal identity we have selected the human bone femur to study the bilateral variation in various indices of femur. The morphology and statistical analysis of femoral anthropometry among different populations reveals a great degree of variation. Femoral anthropometric measurements from different countries are likely to be affected by racial variations in diet, heredity, climate and other geographical factors related to life style**.** Similarly bilateral variation is also expected to occur owing to profession, habits etc. We took this study to know the bilateral differences between the right and the left bones among the population of this part of Maharashtra.

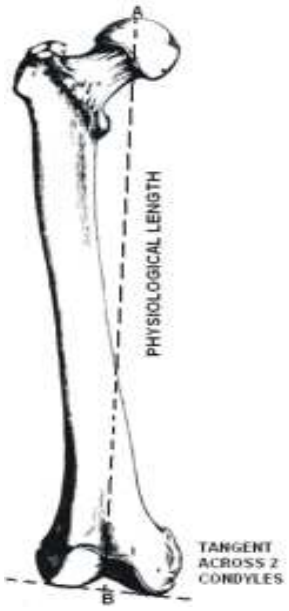
MATERIALS AND METHODS

A total 106 (58 right and 48 left) intact human adult femora were obtained from the department of Anatomy, MGIMS, Sevagram which were collected for teaching purpose. The study is based on a total of 07 parametric variables related to the femur and which were obtained from the head and shaft of the femur according to standard anthropometrical method.[1, 2] The number of nutrient foramina and their location in respect to the proximal end of femur on both sides were studied.

Instruments Used: Sliding Caliper, Osteometric Board

Formulae Utilized:

Fig. I. Figure showing measurement of Physiological Length



Sagittal Diameter of Middle of Shaft: It measures the distance between the anterior and posterior surfaces of the bone, approximately at the middle of the Shaft i.e., the most prominent part of the linea aspera or two points farthest apart in sagittal plane at mid-shaft

Transverse Diameter of Middle of Shaft: It measures the distance between the margins of the bone at right angle to sagittal diameter of the middle of the shaft or two points farthest apart in coronal plane at mid-shaft.

Physiological Length / Oblique Length (PL): It measures the projective distance between the highest point of the head and the tangent to the lower surface of the two condyles. (Figure I.)

Platymeric Index: This index measures the degree of antero-posterior flattening of the femoral shaft. It is calculated as shown in the following formula-

$$\text{Robusticity Index} = \frac{\text{Sagittal Diameter of Middle of Shaft + Transverse Diameter of Middle of Shaft}}{\text{Physiological Length}} \times 100$$

Platymeric Index (PI) =

Upper Sagittal Diameter of Shaft / Upper Transverse Diameter of Shaft X 100

Upper Transverse diameter of shaft / Subtrochanteric Sagittal Diameter: It measures the transverse diameter of the upper end of the shaft, where it shows maximum lateral projection. When the projection is not clear, this measurement is taken 2.5cm below of the base of lesser trochanter. Transverse plane is to be understood with regard to upper epiphysis.

Upper Sagittal Diameter of Shaft: It measures the antero-posterior diameter of the upper shaft taken at right angle to the upper transverse diameter of shaft.

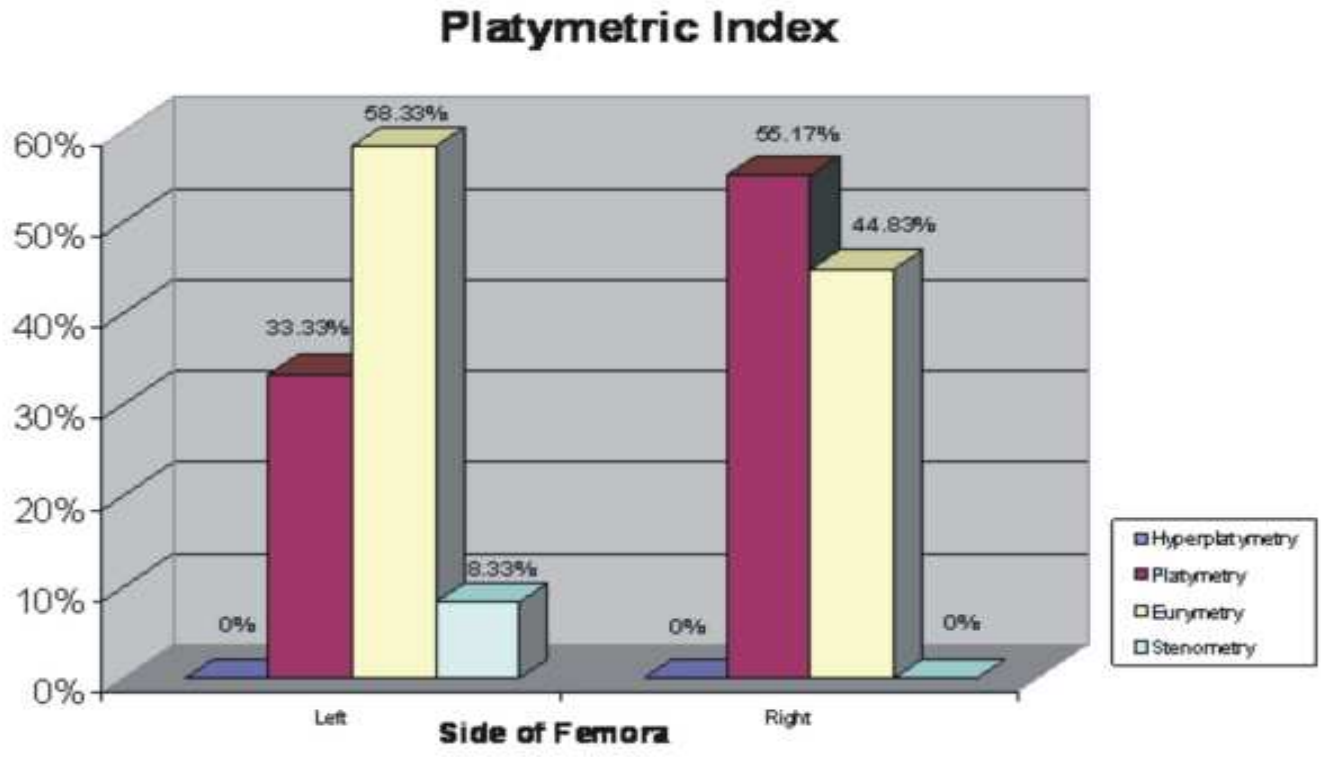
The level of "platymetry" (flattening of the superior femoral diaphysis) was divided into 4 groups in relation to the PI: hyperplatymetry, platymetry eurymetry and stenometry[3]as shown in Table I.

OBSERVATIONS

With the aid of caliper and osteometric board various measurements were done. Physiological length, Robusticity index, Platymeric index and foraminal indices are shown in Table II. Numbers of foramina seen are shown in Table III of both the sides of femur. The difference between right and left femur is not statistically significant but left one has shown higher values as compare to their right counterparts. The Physiological Length of left femur came out to be 42.95 ± 1.67 cms and 42.69 ± 1.94 for right femur. Similarly Robusticity index was 14.44 ± 1.23 and 13.11 ± 0.93 for left and right femur respectively. The platymeric index for left and right femur came out to be 87.63 ± 7.34 and 86.49 ± 6.77 respectively. Whereas Foraminal index was between 33 to 62% for left femur when calculated from proximal end and between 31 to 61% for right femur.

Figure II. Figure showing platymeric index observed in femur of both sides

Platymetric Index



Similarly number of nutrient foramina ranges from increasing frequency of double, single and triple foramina for left femur and in the increasing frequency of single, double and triple foramina per bone in right femur.

Levels of Platymery are also shown graphically in Figure II.

DISCUSSION

The left femora were generally showed larger values than the right, but the difference was statistically insignificant and in accordance with those of previous study.[4]

Femoral anthropometry from the two different sides revealed slight variations that are likely to be the result of compounding factors such as nature of work, mode of life, metabolic status, continuous modifications that may affect the characteristics of man and the effects of civilization on the composition of the human body in both positive and negative ways.

None of the femora in the present study has shown more than three foramina which correspond to earlier work[5] and also not in accordance with [6] who have shown even 4 foramina also.

The means of the PL measurement of the femora indicated that Central Indian individuals have retained medium femora when compared with those from other data available.[6] It seems obvious that anthropometric measurements could show differences between various populations from different ages, and these may considered to be constantly updated.

In the present study, the absence of any records that could help us in the determination of the sex of bones was the main obstacle to include. However, it should be kept in mind that the present study and the previous studies have a small number of femora it is worthwhile to perform a similar further study with a large number of bones from different regions.

CONCLUSION

The femur has been studied successfully by physical anthropologists for many years. Such traits as femoral head diameter and bicondylar width have been examined extensively and are of great value to forensic anthropologists. The findings are of immense utility for medicolegal experts. The observations made can be utilized in cases of exhumation and unidentified remains of bones. This study is also relevant to fracture treatment. The findings can also be useful in

Table I. Showing levels of platymetry

S No.	Flattening of superior Femoral diaphysis	PI range (min-max)
1.	Hyperplatymetry	Less than 75.0
2.	Platymetry	75.0–84.9
3.	Eurymetry	85.0–99.9
4.	Stenometry (transverse platymetry)	100.0 and more

Table II. Showing various measurements observed.

S.N	Indices	Left Femur (cms)	Right Femur (cms)	P value
1.	Physiological Length	42.95 ± 1.67	42.69 ± 1.94	P>0.05
2.	Robusticity Index	14.44 ± 1.23	13.11 ± 0.93	P>0.05
3.	Platymetric Index	87.63 ± 7.34	86.49 ± 6.77	P>0.05
4.	Foraminal Index*	Between 33 to 62%	Between 31 to 61%	

*Position of Nutrient Foramina in relation to proximal end.

Table III. Showing number of nutrient foramina seen in femur of both sides

S.No.	Number of Foramina	Left Femur (n=48)	Right Femur (n=58)
1.	Single	19 (39.6%)	29 (50%)
2.	Double	26 (54.2%)	24 (41.4%)
3.	Triple	03 (6.3%)	05 (8.6%)

intramedullary reaming and nailing of long bone in case of correction of fractures particularly in the weight bearing femur.

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Radiographic evaluation of 3rd molar Development in relation to Chronological Age among Rural population

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ABSTRACT

Background: Age assessment is one of the important parameters for establishing the identity of a person. Among the numerous methods developed over the years for estimation of age are, changes in the sternal end of ribs, analysis of cranial suture closure (ecto & endocranial closure), changes in the symphysis pubis, secondary changes in the vertebrae, appearance/fusion of various ossification centers and evaluation of various stages of development/eruption of permanent teeth. Evaluation of various stages of eruption of permanent teeth can be done radiologically and morphologicaly, and both give valuable data for assessment of age of an individual. **Material & Method:** The present study was conducted in the age group of 15-24 years in 252 subjects, in the Department of Periodontics, Rural Dental College, Loni from 4th May 2009 to 10th May 2010. Orthopantomograms of all the subjects were taken and the various stages of eruption of teeth which were evaluated by using Demirijian classification. The data generated was analyzed using SPSS software. **Results:** Total 252 cases selected for study out of which 147 were males and 105 were females. Orthopantomograms of all the subjects were taken and the various stages of eruption of teeth which were evaluated by using Demirijian classification

The data generated was analyzed using SPSS software and had a significant correlation with assessment of age.

Key words: Third molar, Eruption., Age.

INTRODUCTION

Establishing of Identity of an individual is an important aspect of a medico-legalists work. Age assessment is one of the important parameters for establishing the identity of an individual [1-4].

Age of an individual is essential data in cases of criminal responsibility, kidnapping, rape, juvenile offenders etc. Determination of age of an individual can be done using various methods which evaluate the morthological changes occurring in the various body tissues, e.g. bones (appearance/fusion of ossification centers, structural changes in the bones/articular surfaces), teeth, hair, skin, cornea etc [1-4].

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Development of teeth with reference to calcification of crown and rot, eruption, attrition and exfoliation provides an important yardstick for the assessment of chronological age with fair accuracy.

The relatively less variability of tooth formation with age, makes the evaluation of tooth formation an important indicator for age assessment [5-8]. Further age estimation becomes difficult after about 14 years of age, as all permanent teeth, except 3rd molar have completed their development rendering them to be the only available tool among the few, for age estimation between mid teens and early twenties. Genetic, environmental, dietary are some of the numerous factors will influence the third molar development and eruption, which leads to variability in the different populations.

As no concrete data existed, a need was felt to generate the data in respect to the local population [9]. The present study the chronological course of third molar eruption is evaluated based on the orthopantomograms obtained.

MATERIAL & METHODS

The study was carried out in the Department of Periodontics, Rural dental College, Loni. The study evaluated 252 subjects, of which 147 were males and 105 were females. All those in the age group of 15-24 years, consenting with good oral hygiene, having a valid age proof were included in the study. Orthopantmograms were taken for all the individuals and evaluated for eight different stages of development of third molar as per Demirijian classification [5] as tabulated below:

Those having third molar mesially, distally and vestibule-orally angulated were classified as impacted and excluded from the study. Also those having congenital anomalies or any disease affecting the skeletal growth and development were excluded.

S.No.	Stage	Distinctive feature	Appearance
1	A	Cusp tip are mineralized but have not yet coalesced	
2	B	Mineralized cusps are united so the mature coronal morphology is well defined	
3	C	The crown is about half formed; the pulp chamber is evident and dental deposition is occurring	
4	D	Crown formation is complete to the dentinoenamel junction. The pulp chamber has a trapezoidal form	
5	E	Formation of the inter-radicular bifurcation has begun. Root length is less than the crown length	
6	F	Root length is at least as great as crown length. Root have funnel shaped endings	
7	G	Root walls are parallel, but apices remain open	
8	H	Apical ends of the roots are completely closed	

RESULTS AND DISCUSSION

The total number of subjects included in the study were 252 of which 147 were male and 105 female (male:female ratio being 1.4:1). The sample size of males in the various age groups ranged between 10-19, with least (10) in age 24 years, and maximum (19) being in age 22 years. Amongst the females the sample size in various age groups ranged between 9-13, with least (9) in age group 19, 21 and 23 years. **Table No 1.**

Table No 1. Age and sex wise distribution of the sample

S.No.	Age	Male	Female
1	15	13	10
2	16	14	12
3	17	11	10
4	18	16	13
5	19	18	9
6	20	15	11
7	21	14	9
8	22	19	10
9	23	17	9
10	24	10	12
Total		147	105

Third molar developmental stages as per the Demirjian classification was done in the representative sample of both the sexes. The analysis of orthopantomogrms revealed that the Demirjian stages A, B, C, D were absent in the representative samples, as these stages would have already developed by age 15 years which is the minimum age for inclusion of the subjects in the study.

The mean age of development for Stage 'D' in males was 16.14 collectively for both maxilla and mandible relatively less than females, where it was 17.57. For stage 'E' mean age was 16.705 years, 17.235 years for 'F', 18.905 years for stage 'G' and 22.38 years for stage 'H'. The data in females was comparable with mean age of 18.15 years for stage 'E', 18.275 years for stage 'F', 19.465 years for stage 'G' and 20.915 years for stage 'H'. The mean age of all the stages in males is less than females by an average of 1.118 years except for Stage 'H' where the mean age in males is more than female by 1.465 years.(**Table 2-5).**

Table No 2. Distribution of various stages of development in Maxilla (Gender wise)

Sex	Excluded		Stages of Development									
			D		E		F		G		H	
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt
F	00	00	6	6	9	12	18	15	33	33	39	39
M	27	27	6	3	12	15	9	12	48	51	45	42
Total	27	27	12	9	21	27	27	27	81	84	84	81

Table No 3. Distribution of various stages of development in Mandible (Gender wise)

Sex	Excluded		Stages of Development									
			D		E		F		G		H	
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt
F	12	12	12	12	9	9	24	24	18	15	30	36
M	30	18	6	9	12	15	24	33	36	39	36	36
Total	42	30	18	21	21	24	48	57	54	54	66	72

Table No 4. Mean age of appearance of various Demirijian Stages of third molar development in Maxilla (Gender wise)

Stage of Development	Male		Female	
	Mean age	SD	Mean Age	SD
D	16.17	0.59	17.17	1.53
E	16.58	0.92	17.33	2.21
F	16.6	0.12	18.20	2.11
G	18.54	1.77	19.68	1.65
H	22.26	2.68	20.90	2.21

Table No 5. Mean age of appearance of various Demirijian Stages of third molar development in Mandible (Gender wise)

Stage of Development	Male		Female	
	Mean age	SD	Mean Age	SD
D	16.11	0.38	17.98	2.23
E	16.83	1.10	18.97	4.13
F	17.87	1.92	18.35	1.91
G	19.27	2.15	19.25	.98
H	22.5	2.48	20.93	2.51

Similar finding have been reported in earlier studies carried out by Kullman et al [10], Yildiray Sisman et al [11], Mincer [12], Yungming et al [13], with earlier development of various stages in males as compared to female.

The finding were in contradiction to the studies conducted earlier by Engstorm [14], Levesque[15], Bhat Vrinda et al [16] , were no significant difference was found among the various developmental stages.

The study corroborates the findings of Mincer [12] , who reported that the maxillary 3rd Molars develop earlier then their mandibular counterparts, but differs with him on one aspect that the mean age of appearance of various stages is slightly late in our study.

CONCLUSIONS

The present study helps in categorically identifying if the individual (Male/Female) is less than or more than 18 years of age. Individuals with Demirijian stage 'A'-'C' can be distinctly identified to be less than 18 years of age, and those with Demirijian stage 'H' can be identified as of age 18 years and above. However the author feels that further research need to be done to corroborate the present findings.

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Study of cases of Poisoning at a District Hospital in Western Maharashtra

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ABSTRACT

Organophosphorous compounds produce significant morbidity and mortality in India. The present study is an attempt to study the cases of poisoning admitted in a District hospital in Western Maharashtra to evaluate socio-demographic variables of these cases & to study the morbidity and mortality in different poisoning cases. Organophosphorous poisoning cases were predominant, amounting to 491 cases (32.97%). Maximum cases (59.16%) were in 18 - 35 years age group, male predominance can be seen as 60.98% cases were male & most of the patients (53.99%) were farmers. Time interval of presentation of most number of cases was more than 4 hrs because of the lack of emergency service and inefficient paramedical service needed for patient transport. In present study 50.94% of cases were hospitalized for 8 - 12 days, 78.04 % cases survived while 277 (18.60%) patients expired because of fatal complications. It is essential to establish strict policies against the sale and availability of insecticides and pesticides which are freely available in the market. Accidental poisoning can be prevented by use of personal protective equipment. There should be easy availability of loans, crop insurance schemes and appropriate market value for agricultural products to prevent suicidal tendency in farmers.

Key words: Poisoning, Socio-demographic variables, Rural area.

INTRODUCTION

Organophosphorous compounds produce significant morbidity and mortality in India.[1].Organophosphorus compounds are the most common suicidal poison in developing countries and mortality continues to be high. Most of these poisonings are usually ingested with a suicidal intent.[2] Organophosphorous compounds are commonly used because of their rapid action, ready availability and knowledge of lethal potency. Poisoning in India is a challenge to both clinical and medicolegal practice. Following classical organophosphorous poisoning, three well defined clinical phases are seen: initial acute cholinergic crisis, the intermediate syndrome and delayed polyneuropathy .[3]

Diagnosis of cases of poisoning is difficult when proper history is not available. When there is delay

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in transfer of the patient to the Hospital, the diagnosis is based only on signs and symptoms or laboratory investigation of body fluids. After death the positive proof of poison rests in detection of poison in the samples at the Forensic Science Laboratory. Negative report shall always be supplemented with clinical/ postmortem findings and circumstantial evidences. The nature of poison used varies in different parts of the world and may even vary in different parts of same country depending on socioeconomic factor and cultural environment. The present study is an attempt to study the cases of poisoning admitted in district hospital Ahmednagar to evaluate socio-demographic variables of these cases & to study the morbidity and mortality in different poisoning cases.

MATERIALS AND METHODS

The present study was carried out at District hospital Ahmednagar in Western Maharashtra which is equipped with emergency ward, ICU, Operation theatre, & MLC section. Records of all the cases of poisoning admitted to district hospital from July 2001 - Aug 2006 were analyzed. Following Patients attended the emergency department: patient brought by relatives directly, patient referred by general practioners & patient referred by Primary health center/Rural hospital. Only cases of chemical poisoning were included in the study and cases of snake & scorpion bite were excluded. All the information was recorded on specially prepared proforma which includes the information about age, sex, occupation, date of admission, date of discharge, history of types of poison, symptoms and signs on admission & mode of management. Analysis was done in the form of percentages & proportions.

RESULTS

The results revealed the findings of the present study of poisoning cases which carried out for a period of 5 years from July 2001 to June 2006; requisite data was collected from medicolegal department at district level hospital Ahmadnagar. (Table 1)

Table 1: Year wise distribution of poisoning cases

Year	Male (%)	Female (%)	Total
2001	161(10.8)	106(7.11)	267(17.93)
2002	181(12.15)	122(8.1)	303(20.34)
2003	177(11.8)	121(8.1)	298(20.01)
2004	221(14.82)	153(10.2)	374(25.11)
2005	168(11.2)	069(4.6)	247(16.58)
TOTAL	908(60.98)	581(39.01)	1489(100)

In present study the total poisoning cases were 1489 out of which Organophosphorous poisoning cases were predominant accounting for 32.97%. Next to Organophosphorous poisoning, unknown poisoning case were 30.96%. Organochlorine poisoning cases were about 6.98 % (Table-2). Salivation, lacrimation, urination, defecation, vomiting, bronchorrhea, bronchospasm, bradycardia were the common sign & symptoms noted among the patients of organophosphorous poisoning.

Table 2: Distribution of cases according to types of poison

Types of Poison	Number of cases (%)
Organophosphorous	491(32.97)
Unknown	461(30.96)
Zinc phosphate	163(10.94)
Organochloro-insecticides	104(6.98)
Drug overdose	119(7.99)
Other(Karosine,Petrollium products)	151(10.14)
Total	1489(100)

Age group was ranging from 0 - 50 years & above. Maximum cases (59.16%) were in age group 18 - 35 years followed by 36 - 50 years age group with 16.32%. Male predominance can be seen as 60.98% cases were male (Table 3). Male to female ratio was 1.5:1.

Majority of cases (63.80%) were from rural area followed by urban area (36.20%). Amongst the rural area majority were farmers (53.99%) (Table 4).

Table 3: Age & sex wise distribution of cases

Age in years	Male	Female	Total (%)
<18	080(5.37)	051(3.4)	131(8.8)
18-35	510(34.25)	371(24.9)	881(59.16)
36-50	151(10.14)	092(6.1)	243(16.31)
>50	167(11.21)	067(4.49)	234(15.71)
TOTAL	908(60.98)	581(39.01)	1489(100)

Table 4: Occupation wise distribution of poisoning victims

Occupation	Cases (%)
Farmers	804(53.99)
Landless laborers/Unskilled workers	313(21.02)
Service(Government/private)	163(10.94)
Students	104(6.98)
Others	105(7.05)
Total	1489(100)

It is observed that the maximum (62.99%) cases reached the hospital 2 - 12 hrs after the consumption of poison (Table 5). Maximum number of cases reached the hospital after 4 hrs of consumption of poison. This might be due to the lack of emergency services and inefficient paramedical services needed for patient transport.

It is also observed that more than half (51%) of total cases of poisoning were hospitalized for 8 - 12 days; and only 14.97% of cases were hospitalized for more than 12 days (Table 6). Most of the case required 8 - 12 days of hospitalization as majority of them were having complications which required minimum 8 -12 days of hospitalization for management. Patient without complication were discharged within 8 days.

The findings of present study showed very good prognosis of poisoning patients admitted at hospital, as out of 1489 cases, 1162 (78.04%) cases survived and only 50 (3.36%) patients were referred to tertiary centre because of non availability of facilities for advanced management procedures such as dialysis and monitoring methods. Atropine and oxime therapy along with ventilatory and other supportive measures, as required, prevent most of deaths in poisoning due to organophosphate compounds. Unfortunately 18.60% (277) patients expired because of fatal complications such as respiratory failure, cardiac arrest, and cerebral oedema (Table 7).

Table 5: Time interval of hospital admission since time of Ingestion of poison

Time interval	Cases (%)
<2 hrs	223(14.97)
2-12 hrs	938(62.99)
12-24 hrs	208(13.96)
>24 hrs	120(8.05)
TOTAL	1489(100)

Table 6: Duration of hospital stay

Duration	Cases (%)
<3 Days	129(11.10)
3-8 Days	267(22.97)
8-12 Days	592(50.94)
>12 Days	174(14.97)
TOTAL	1162(100)

Table 7: Prognosis of poisoning cases

Prognosis	Cases (%)
Expired	277(18.60)
Survived	1162(78.04)
Referred	50(3.35)
TOTAL	1489(100)

DISCUSSION

Poisoning is one of the common cause of admission of young adults in the medical wards. The findings of the present study reveals that organophosphorous poisoning is predominant accounting for (32.97%) with maximum cases (59.16%) were in 18 - 35 years age group. Males were predominantly affected (60.98%), similar to study by Krupesh et al [4] where 73 % were males. Contrary, in a study conducted by Malik et al [5] in Kashmir, it was observed that the females were predominant (69.51%). Bhattarai et al [6] reported that the maximum number of patients were between the age of 20-40 years. According to the findings of study conducted by Siwach [7] a majority (70 %) of poisoning was seen in age group between 15 – 30 years. Third and fourth decade of life were most affected age groups possibly because of being the working population and having lot of responsibility.

Out of 1489 patients 53.99% were farmers. Nigam et al [8] had also reported that the highest incidence of organophosphorous poisoning is in persons engaged with agriculture, constituting 39.60 %. Poisoning is more common in farmers and in rural areas it may be accidental or suicidal. Most cases required 8 - 12 days of hospitalization as majority of patients were having complications. In concordance to our findings, in a study by Krupesh et al [4] average days on ventilation were 6.17. The prognosis of poisoning patients in present study showed that it was very good with a survival of 78 % of cases and mortality of 22% as compared with others findings. The results of the study conducted by Unnikrishnan et al[9] reported 28% mortality; Singh et al[10] reported 27% at Wenlok Hospital, Mangalore. Overall the mortality rate in India range 15% to 30 %.[11] Bhattarai ET al (2006) reported that overall mortality was 6.4% during the period of two years.[6]

Present study highlights the problem of organophosphorous poisoning in this region. It is essential to establish strict policies against the sale and availability of insecticides and pesticides which are freely available in the market. Like drugs, sale of insecticides and pesticides should be monitored by special authority. Due to lack of knowledge regarding safety measures and easy availability of pesticides and insecticides accidental poisoning was more common. Unfavorable environmental conditions leading to

crop damage aggravating poverty and unpredictable prices for farm products were some of the other reasons for suicidal poisoning.

Accidental poisoning can be prevented by taking care during preparation of insecticidal solution, spraying the by using mask, gloves, goggles and taking bath after spraying and keeping the poison away from the reach of children. It is observed that farmers do not purchase protective devices though available at affordable cost due to sheer ignorance. Legislation in this regard of compulsory sale of protective equipment with spray pump would definitely help in reducing accidental poisoning. To prevent suicidal tendency in farmers the Government should provide some policies like easy availability of loans at low interest, crop insurance schemes and appropriate market value for agricultural products. There should be availability of primary care for patients at PHC level like gastric lavage, antidotes & ambulance. There should be availability of superspeciality services and equipments at district level. The responsibility lies in community also to give some psychological support to depressed people and there should be understanding in the family.

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