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International Journal of Political Science	2	6500	6000	508	469
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ORIGINAL ARTICLE

A Study on Death Certification in Ras-Al-Khaima

B Meel

ABSTRACT

INTRODUCTION:

Background: Audited information on the causes of death is one of the basic components of a country's health information system. Data are usually derived from death certificates. A critical analysis of Ras-Al-Kheimah (RAK) hospitals' death certification was done establish the quality of care. Such an audit is simple, cheap, and useful for monitoring the quality of services.

Objective: To determine the accuracy of death certification by doctors in the RAK Hospital.

Method: Second year medical students were assigned to collect copies of death certificates as a part of their assignment from a prominent RAK hospital. They were divided into two groups. A lecture on death certification was delivered prior to the students going to the hospital. Students examined the certificates, and the results were displayed.

Results: Fifty-one death certificates were collected from the RAK hospital. A majority 36 (70.58%) of them were for males, and their mean age was 42 years. There were 14 females (29.41%) in this study. About half (49%) of them were foreigners from 14 different countries. Cardiac failure was the commonest (70.58%) cause of death, followed by respiratory failure (11.76%).

Conclusion: Cardio-respiratory failure as a cause of death was found in the majority (82.34%) of cases as per the death certificates from the RAK hospital.

KEYWORDS | Death certification; Mortality statistics; Quality of care

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INTRODUCTION

Audited information on the cause of death is one of the basic components of a country's health information system. Data are derived from death certificates and are useful in decision making in running a hospital.[1] (Meel, 2003). Wrong opinions and decisions in writing down a cause of death is undesirable and sometimes very dangerous. A culprit can be free, and an innocent person can be charged. Therefore, an expert opinion is always required before certifying a death.[2] (Meel, 2017).

The research found that there were many death certificates that were filled incorrectly, even though it is an important job. Many times, a natural death was made to be an unnatural one and vice versa. This led to a lot of medicolegal problems. It is particularly difficult and problematic to state an unnatural death as a natural death. This leads to trauma for the deceased's family at a time of emotional

stress, and insurance companies may deny payments on their life policies.[3]

A death notification form (BI 1663) is a legal form proposed by the World Health Organization (WHO).[4] It needs to be completed upon the death of a person by a medical practitioner in terms of Act No. 51 of 1992, of Births and Deaths Registrations.[5] A copy of the certificate of cause of death must be submitted to the Department of Home Affairs but this process varies from country to country. This is secret information and is supposed to be submitted in a sealed envelope, but this practice is also not followed in many countries. Generally, the doctor is expected to attend during the process of dying and should be able to diagnose death correctly but again a nurse practitioner is does this task in many countries. The medical practitioner should also know the fact that issuing a death certificate is an important issue. Despite this fact, very few medical schools offer formal teaching in the process of death certification.[6] The purpose of this article is to highlight the problem of death certification in RAK hospitals, United Arab Emirates.

METHOD

The RAK hospital is attached to RAK university medical school and is a teaching hospital. The author was a visiting professor to teach undergraduate students. This hospital serves the Res-Al Khaimah people who are residing in that area. Most of them are foreigners from different countries. A group of medical students were taken to the hospital to do an exercise to learn about death and death certification. They were given the job to record all the deaths from the death notification forms - the so-called death certificates-during a six-month period. They found 51 deaths and the cause of death was recorded in each case. The death notification forms were obtained from the hospital and the causes of death based on these forms were compiled and then analysed manually.

RESULTS

Fifty-one death certificates were collected from the RAK hospital (Table 1). The majority of 36 (70.58%) of them were males and the mean age was 42 years. Females constituted 14 (29.41%) in this study. About half (49%) of them were foreigners from 14 different countries. Cardiac failure was the commonest (70.58%) cause of death, followed by respiratory failure (11.76%). Car accidents were listed in 7.84% cases (Table 1). Cerebral vascular accidents were recorded in 5.88% cases, while esophageal hemorrhage and burns were accounted for only 1.96% respectively (Table 1). Falling and low blood pressure were stated in20% of the cases along with heart failure, and rest of them were listed as miscellaneous with labels such as stopped heart and high fever.

Table 1: The cause of death in the RAK hospital, UAE.

Cause of death	Number	Percentage
Car accidents	4	7.84%
Heart attack/heart stoppage/cardiac arrest	36	70.58%
Cerebral vascular accident/stroke	3	5.88%
Respiratory failure	6	11.76%
Burns	1	1.96%
Oesophageal haemorrhage	1	1.96%
Total	51	100%

DISCUSSION

This study was carried out in the Res-Al-Keimah hospital which is a component of United Arab Emirates (UAE). It is relatively less developed than other parts of UAE. It is an important to teach the students who are going to become medical officers to understand the value of death certification. This study identified that up to 82.34% of the death certificates were incorrect and thus had no value. The author tried to find out the reasons for these many inaccurate death certificates, and then one colleague mentioned that this is because of failure in diagnosis. The doctors could not establish a diagnosis and therefore they choose to way out as it leads to least legal problems, so they simply write it as fall of blood pressure, heart stop, or low function of the respiratory system. It is not only in UAE but also in some countries like South Africa have also been very poor diagnosis written in the certificate

of death as in Transkei region. Poor quality of death certification was thus reported by the author.[2, 7, 8]

The stigma attached to HIV-related disease has made medical officers reluctant to specify it as a cause of death.[9] This is partly because insurance companies are not prepared to pay in the case of a positive result. The perceived lack of confidentiality in the previous death certificate form has been thought to contribute to this reluctance.[11] This reluctance is persisting in medical officers. Moreover, the certifying physician purposefully includes wrong information on certificates of death to conceal diagnosis that might cause discomfort to family members.[10]

Cardiorespiratory failure is commonly used as a cause of death in many hospitals worldwide. It means that the heart and lungs stopped functioning. It is simple to explain that death doesn't occur without the heart and lungs stopping. Cardiorespiratory failure is not a cause of death. It is also not a mechanism of death. In 1993 Jordan and Bass[11] discovered that 31.9% of a sample of death certificates completed at a Canadian tertiary care teaching hospital contained major errors. The highest rate of inaccurate completion occurred within the Department of Medicine with 40.3% of certificates classified as unacceptable because of major errors.[12]

The mechanism of death is important as an underlying cause of death; without it death could have not occurred.[4,10] This is happening because most the physicians do not receive training in determining the cause death. The Department of Forensic Medicine has the responsibility to train their students so that they do not have difficulty in certification of death. Most of the time the information given on death certificates either has no meaning or is misleading. Health care managers utilise this inaccurate data and may draw inaccurate conclusions regarding the cause of death, which may have an impact on health care planning.[13]

The external causes of death such as a motor vehicle accident and burns were recorded in this study but again the mechanism of death was not described. There are no guidelines to help medical officers in dealing with such cases and death certification is often arbitrary and inconsistent.[14] Death certification is supposed to be written by the senior doctor; however, previous studies suggest that seniority alone does not guarantee of accuracy in certification of death.[15]

CONCLUSION

Cardio-respiratory failure as a cause of death was found on the majority (82.34%) of death certificates in the RAK hospital. This is very high inaccuracy in certification of death. There was knowledge deficiency among medical practitioners who are certifying death. Medical education in this regard is needed for medical students as well as medical practitioners, and frequent auditing of certificates of death is an important step in improving quality of care in hospitals.

Ethical issue: This is a record review of death notifying forms but commonly called as a death certificate. Res-Al-Kheimah University has given permission to visit hospital and to review record the cases.

The author has also received ethical permission for case report publication (approved project No. 4114/1999) from the Ethical Committee of the University of Transkei, South Africa.

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ORIGINAL ARTICLE

Retrospective Analysis of Organophosphorous Poisoning Cases Between 2016 and 2020 in Urban India

Gururaj Biradar[1], Pavanchand Shetty H[2], B Suresh Kumar Shetty[3], Prateek Rastogi[4], Jagadish Rao P P[5], Haneil Dsouza[6], V Yogiraj[7]

ABSTRACT

INTRODUCTION:

Background: Agriculture is one of the main source of income in rural India. Recent times have seen a lot of advancements in the chemicals used for pest control to improve the quality of crops. However, the ease of availability and the high toxicity of these chemicals has led to accidental as well as deliberate casualties due to poisoning.

Material and Methods: A retrospective study was conducted at VIMS Bellary between the years 2016 to 2020 by collecting data from the postmortem reports of deaths due to organophosphorus poisoning. The sample size of the present study constituted 725 poisoning cases.Information about the age and sex of the victims , the type of poison, chemical examiners report occupation, socio- economic and marital status were collected from the inquest reports furnished by the Investigating authorities.

Results: In the present study it was found that the mortality was more in males compared to females and majority of cases was found in people involved in agricultural profession in rural areas under low income group.

Conclusion: The study concludes that organophosphorus poisoning is more common in rural India with lower socioeconomic status.

KEYWORDS | Organophosphorus; Poisoning; Insecticide; Mortality

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INTRODUCTION

Agriculture being one of the biggest source of economy in India has seen a lot of technological advancement to increasethe production. There has been lot of scientific progress in relation to the various chemicals used for increasing the production of the crop and to stop the growth of crop destroying pests. The rampant use of chemicals in agriculture has led to accidental exposure of the farmers. The easy accessibility of chemicals has resulted in it being preferred for suicide.[1] Voluntary exposure to poisonous chemicals with intent of suicide can be fatal. The reasons for the high toxicity and lethality of organophosphorous is due to its ease of absorption through all the routes that is respiratory, gastrointestinal, ocular, dermal etc. The government has tried to create awareness by proper labelling, regulating and by deploying various educational projects. The general public still remains unaware of the basic concept that the chemical can penetrate

the skin and cause toxic effects.[2] In general, suicidal poisoning is common because of its easy availability resulting in large number of deaths.[3]

MATERIALS AND METHODS

In India autopsy is mandatory for every case of poisoning death. The autopsy is conducted for poisoning death as law of the land makes it mandatory with the primary objective of ruling out any suspicion associated with the poisoning death. The present study is a retrospective analysis of the data collected from the postmortem reports of the poisoning cases conducted at VIMS Bellary between years 2016 to 2020.

A total of 725 autopsy reports due to death from poisoning were included in this study. Data was analyzed retrospectively in respect to the socio-demographic profile of poisoning casesin each age group, sex, Marital status, domicile pattern, Occupational wise and socio economic status. The qualitative analysis of the poisoning cases were done in Regional forensic science laboratory.

RESULTS

Total of 725 postmortem reports were analyzed and various required parameters were recorded and analyzed.In the present study maximum number of victims 342 (47.17%) were in the age group of 51-60 years, followed by 240 (33.10%) who were in the age group of 31-40 years (Table 1)

Table 1: Age wise Distribution.

Age (Yrs)	No of cases
11- 20	06
21-30	29
31-40	240
41-50	76
51-60	342
61-70	28
>70	04
Total	725

Male preponderance was seen in gender wise distribution. The number of males were 625(86.2%) and females were 100 (13.79%) of the total cases as shown in Fig.1. Cases reported were more in married as compared to unmarried individuals as shown in Fig. 2.

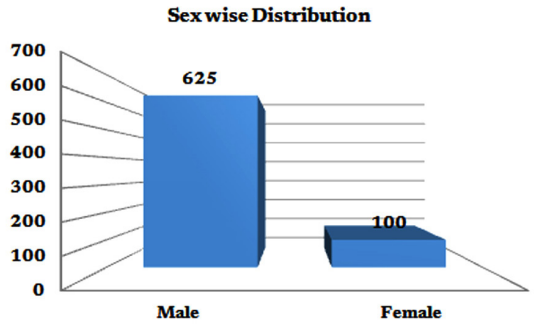

Fig. 1: Sex wise Distribution.

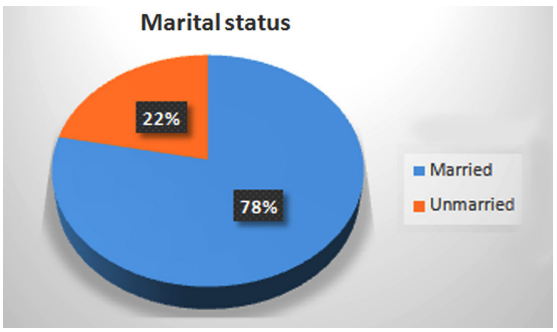

Fig. 2: Marital status wise Distribution

In the present study, the distribution of domicile pattern of the victims showed that 659 (90.89%) were from rural areas and 66 (9.10%) cases were from urban area (Table 2).

Table 2: Locality Distribution.

Locality	No of cases
Urban	66
Rural	659
Total	725

The exposure to poisoning and death was seen more in the rural population in comparison to the urban population.

The number of deaths when tabulated based on the profession it was found that the most common profession exposed to poisoning by organophosphorus was agriculture. The

number of death from the agricultural background was 510 (70.34%) and lowest was among the homemakers as shown in Table 3.

Table 3: Occupation wise Distribution

Occupation	No of Cases
Employed	78
Un employed	63
Student	35
Agriculturist	510
Housewife	39
Total	725

As per the socioeconomic status the most exposed population was from the lower income group that is 547 (75.44%) cases and lowest cases were among high income group as shown in Figure 3.

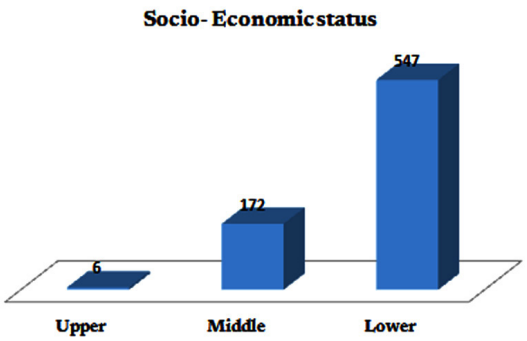

Fig. 3: Socioeconomic Status wise Distribution.

DISCUSSION

Organophosphorusinsecticides are highly toxic chemicals. In developing countries pesticides are commonly used for committing suicide.[4] Globally death due to poisoning is of major clinical concern.[5] In the present study an attempt was made to study the demographic profile of organophosphoruspoisoning. The present article examines the most vulnerable age group, socio economic status and the gender of the victims of poisoning.

In this study it was found that the most vulnerable age group was in the range of 51 to 60 years (Table 1, Fig. 1) which might probably be due to high level of stress in that particular age due to family and social responsibilities, similar observations were seen in other studies.[6,7] Added to this males were the majority in overall comprising (86.2%) of the case load (13.79%) cases were of female. The high incidence may be because males are more exposed to stress, strain and occupational hazards compared to females. The reason for this can be attributed to the fact that males form a majority of the population going out for work, and since the burden of earning for a livelihood are on them. Our findings are in accordance with the study conducted by Vinod Go vsavi et al[9], Kanchan T et al,[10] Gurudut K S et al,[11] Sanjeev Kumar etal,[12] Subash Vijaya kumar,[13] Shetty AK[14] and Andrew H et al.[15] Where as the study conducted in Moodabidri and Nepal by Sadananda Naik et al[16] and Amarnath Mishra et al[17] showed female predominance.

In the present study rural population (Table 2) was seen to be more involved in poisoning death which was similar to observations seen in studies conducted byJoshi et al and Dalal JS.[6,8] In the present study it was found that 75.44% were from lower income group and least in upper income group 0.827%. The suicides in the lower class may be due to various stress factors coming from financial, social, family problems, low level of education, immaturity, Easy availability of poisons, lack of knowledge about the deleterious effects of the pesticides make them easy victims also.

The present study also brings into focus that the most vulnerable profession is farming and in the lower income group, probable reason for this is the easy accessibility and availability of chemical in this profession which is undoubtedly the predominant profession in rural areas. (Table 3, Fig. 3). High prevalence in married individuals can be accounted for the increased stress due to family responsibilities and conflicts.

CONCLUSION

The study suggests that organophosphorus poisoning is prevalent in rural farming population belonging to lower socio-economic status with preponderance in married males of late middle age. The reasons for the rise in cases may be the increased use of chemicals to increase the production thus increasing availability and accessibility. The government

and regulatory bodies need to make changes to reduce and regulate the rampant use of such toxic chemicals which will directly reduce the incidence of poisoning cases.

Authorship contributor statement: The authors GB, PSH, VY conceptualised the design of the study. GB and PSH acquired, analysed and interpreted the data, GB drafted the article, All authors revised it critically for important intellectual content, All authors finally approved the version.

Conflict of Interest:

The author has made no acknowledgment in this article.

Ethical Clearance

Taken from VIMS, Bellary

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ORIGINAL ARTICLE

A Comparative Analysis of Chronological age with Dental age and Skeletal age in 6 years to 18 years age group individuals coming for age Estimation in the Department of Forensic and State Medicine, Medical College, Kolkata

Archita Mukherjee[1], Chandan Bandyopadhyay[2], Poulomi Mukherjee[3]

ABSTRACT

Introduction:

Age estimation is an essential assignment in clinical forensic medicine. In forensic medicine department of Medical College, Kolkata, dental age is assessed by noting eruption/emergence of respective tooth and skeletal age is estimated by observing appearance and fusion of secondary ossification centres on the skiagram, in reference to Galstaun's chart. Both are age-old and have significant observer variations. This study is done to ascertain applicability of these methods to contemporary population.

Objectives: To determine correlation between dental, skeletal and chronological age of the study population.

Materials and methods: A cross-sectional and observational study was performed on 52 Bengali subjects of 6-18 years age (36 male and 16 female) excluding subjects with obvious skeletal or developmental abnormalities and without valid documentation of age. Pearson's coefficient was applied to measure the correlation, as mentioned.

Results: Chronological age was found to be positively correlated with dental and skeletal age and found to be statistically significant ($p<0.01$). The correlation between dental and skeletal age was also found to be statistically significant ($p<0.01$).

Conclusion: The routine methods used for age estimation is simple, cost effective, easy to perform with minimum training and is still applicable to the contemporary population.

.KEYWORDS | Age estimation; Chronological age; Correlation; Dental age; Skeletal age

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INTRODUCTION

Age estimation is an important assignment in forensic medicine and is carried out for different purposes, civil and criminal. Dental maturity is considered as one of the most reliable methods for estimation of age There are various methods available for estimation of age from teeth e.g., visual, chemical, radiological and histological.[1]

The skeletal maturity of the individual is known as bone age. Bone age is an indicator of physiological development and is distinct from the chronological age. The appearance and union of the different secondary centres of ossification follows a fairly definite pattern and time schedule from birth to maturity.[2] A Radiological study of these skeletal maturational processes provides a valuable criterion of the level of osseous maturation up to a certain age. The relation between dental, skeletal and chronological age are of great interest in indicating an advancement or delay compared to standard growth. Hereditary, environmental, nutritional, sexual, metabolic, social, emotional and cultural factors affect growth and development greatly.[3,4] Throughout the scientific literature, available all over the world, there are several studies which focused in relationship between the dental age, skeletal maturity and chronological age among different populations and different age groups sometimes stratified with other variables. To our knowledge no such study is available in local population. Therefore, in this present study we want to determine and compare dental age and skeletal age with chronological age of the study sample and to determine correlation between dental age, skeletal age and chronological age in the same context. We think the results will be of great help in the field of clinical forensic medicine.

OBJECTIVES

General Objective: To determine the reproducibility of routine methods of age estimation used in the Department of FSM of Medical College, Kolkata.

Specific objectives:

- To determine chronological age from valid documents of birth.
- To estimate dental age from observation of eruption/emergence of respective tooth.
- To estimate skeletal age from observation of appearance and fusion of ossification centres around pre-specified joints in digital skiagram with respect to Galstaun's chart
- To calculate, statistically, the correlation between chronological age, dental age and skeletal age.

MATERIAL & METHODS

Study Design: A cross-sectional and observational study.

Study Population: Individuals from Kolkata metropolis and its suburban towns, belonging to 6-18 years of age group and coming for estimation of age in the Department of Forensic and State Medicine of Medical College, Kolkata.

Place of Study: Department of FSM, Medical College, Kolkata.

Period of study: 1.09.2021 to 31.01.2022

Sample size: 52 (n =52) individuals of both genders. Male= 36, Female=16.

Sampling Technique: Census method (Complete Enumeration Survey Method)

Sampling Criteria

1. Inclusion criteria: All Male and Female subjects 6-18 years of age who attended department of FSM of Medical College, Kolkata for estimation of age, during the period of study.
2. Exclusion Criteria

- Individuals not having valid documentation (Discharge certificate following delivery/birth from government or private health institutions & Certificate of Registration of birth showing evidence of institutional delivery) of Chronological age,
- Individuals with obvious skeletal deformity.
- Individuals suffering from obvious disorders of growth and development.
- Individuals suffering from documented malnutrition.

Study Tools

- Metallic Probe
- Standard charts of dentition.[5]
- Digital Skiagrams showing antero-

posterior view of wrist joint, antero-posterior and lateral view of elbow joint of non-dominant side and antero-posterior view of pelvis

- View box
- Galstaun's chart.
- Technical feature of X-ray machine-generator of 80KW (kilowatt) power, collimator with focal spot size of 0.6mm, anode heat capacity of 300 KHY (Kilo Heat Unit where 1 Joule= 1.4 HU), ceiling suspended tube with movement in all direction, x-ray table having a weight bearing capacity of 200 kg, digital detector with a spatial resolution of 2.5 lines pair/millimetre, high speed processor of 32 bit and an image storage disc of 70 gigabyte.

Study Technique

- ***Consent:*** Before commencement of examination, the procedure is explained thoroughly in their own vernacular to the subjects including their legal guardian/ parent (as most of the subjects were less than 18 years). Thereafter written and witnessed informed consent was obtained from their legal guardian/ parent along with the ascent of the subjects. The documentations regarding consent were preserved properly.
- Chronological age, as on the day of examination, was calculated from the certified date of birth i.e., from the valid certificate of registration of birth/discharge certificate of following delivery.[6]
- For dental examination, the subject was made to sit on a stool under proper illumination and exposure. Then, eruption/emergence of respective tooth (Temporary and Permanent) is observed with a probe as per conventional method.[1,7]
- Digital Skiagrams of specific parts [Wrist of non-dominant side (AP view), Elbow joint of non-dominant side (AP and Lateral view) and Pelvis (AP view)] was taken as per standard specifications and skeletal age was estimated by observing the status of appearances and fusions of secondary ossification centres with reference to the Galstaun's chart.[8]
- To minimize observer bias, dental and radiological observation of each case was recorded separately and independently by investigators according to predetermined standardized criteria.
- Observations were tabulated with the help of Microsoft Excel and statistical analysis were performed with the help of SPSS software.
- The central tendency of the data was measured in the form of mean, median, mode and range. The dispersion was calculated by standard deviation. To determine the correlation between the chronological, dental and skeletal age, Pearson's correlation coefficient was calculated.

RESULTS

Of the samples collected, 69.2% were male and 30.8% were female (Table No 1).

Table 1: Gender wise distribution of samples.

Gender	n	Percentage (%)
Male	36	69.2
Female	16	30.8

The sample had most subjects (16/30.72%) in the age group of 10 to 12 years, followed by (12/23.10%) in the age group of 8 to 10 years (Table no 2).

Table 2: Age wise distribution of sample

Age group	n	Percentage (%)
6 to 8	1	1.92
>8 to 10	12	23.10
>10 to 12	16	30.72
>12 to 14	11	21.16
>14 to 16	6	11.55
>16 to 18	6	11.55

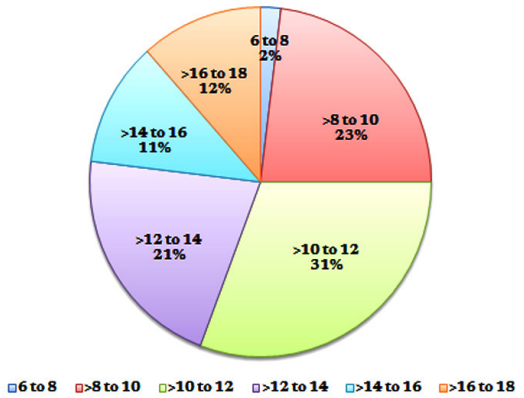

Fig.1: Age wise distribution of sample.

The mean chronological, dental and skeletal age of female subjects were 11.31, 11.66, 11.47 years respectively, whereas that for male subjects were 12.47, 12.97, 13.09 years respectively (Table No.3).

Table 3: Gender wise mean age Mean age of study parameters.

Gender	Chronological age	Dental Age	Skeletal Age
Male	12.47	12.97	13.09
Female	11.31	11.66	11.47

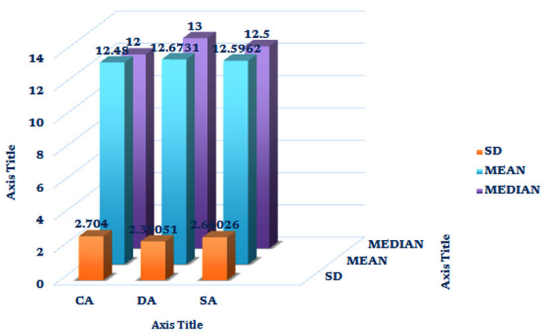

Fig. 2: Chart showing central tendency of the study sample.

Overall mean chronological, dental and skeletal ages were 12.48, 12.6731 and 12.5962 years respectively. (Table No.4)

Table 4: Measures of Central Tendency of various study parameters.

Statistical Parameter(N=52)	Chronological Age (CA)	Dental Age (DA)	Skeletal Age (SA)
Mean	12.48	12.6731	12.5962
Median	12	13	12.50
Mode	11	15.50	10.50
Std. Deviation	2.704	2.39051	2.64026
Range	10	7	10
Minimum	8	8.50	7.50
Maximum	18	15.50	17.50

Standard deviation for chronological, dental and skeletal age were 2.704, 2.39051 and 2.64026 respectively. (Table No.4)

A correlation was found between chronological age and dental ages. (Table No.5)

$$r=0.897, p<0.01$$

A correlation was observed between Chronological and skeletal ages. (Table No.5)

$$r= 0.949, p<0.01$$

A correlation was also found between dental and skeletal ages (Table No.5)

$$r=0.884, \quad p<0.01$$

Table5: Overall relationship between Chronological, Dental and Skeletal age.

		Chronologica age	Skeletal age	Dental age
Chronological age	Pearson Correlation	1	.949**	.897**
	Sig. (2-tailed)		.000	.000
	N	52	52	52
Skeletal age	Pearson Correlation	.949**	1	.884**
	Sig. (2-tailed)	.000		.000
	N	52	52	52
Dental age	Pearson Correlation	.897**	.884**	1
	Sig. (2-tailed)	.000	.000	
	N	52	52	52

Correlation is significant at the level of 0.01 (2- tailed)

DISCUSSION

In available literature, there are limited number of studies in India on estimation of age, both by application of comparison based radiological method and by observation of dental eruption; even fewer in West Bengal. As age estimation is a common routine assignment, as an aid to medicolegal cases, there is need to check applicability of the age old methods used in

present study setting.

Our study sample mostly comprise of the individuals, who sought age estimation for competitive age category sports. The sample showed preponderance of male subjects than that of female subjects (Table No. 1). This phenomenon can be attributed to the fact that females of local population are not usually encouraged to outdoor sports e.g., swimming, tennis etc. Thus, creating a gender-based discrepancy in the sample size.

It was observed that the mean chronological, dental and skeletal age for females were lower than that of male individuals (Table No. 3).

There was no significant difference between the overall mean, median and mode of chronological, dental and skeletal age (Table No. 4).

We observed highly significant positive correlation between chronological vs dental, chronological vs skeletal and dental vs skeletal ages (Table No. 5) But the highest correlation coefficient was between chronological and skeletal age i.e.; 0.949.

In the study of Palanisamy V et al[9] on 104 children of 9-14 years of age in Karnataka, they used hand-wrist radiographs and Fishman's skeletal maturation index for skeletal age and Demirjian's method for dental age estimation. They found that chronological age was positively correlated to dental age and skeletal age while being statistically significant ($P < 0.01$). The correlation between dental age and skeletal age was also statistically significant with $P < 0.001$ and correlation coefficient of 0.683 and 0.704 for males and females respectively. This outcome is consistent with the results of our study.

The study of Hasan BM et al[10] on 112 Sudanese patients of 7-16 years age using Cervical Vertebral Maturation stages for skeletal and Demirjian's method for dental age estimation, showed an overall highly significant correlation between chronological, dental and skeletal age ($P<0.05$). Our results are also similar to this.

The outcome of our study is also similar to studies done by Gupta M et al[11] and Chaudhury K et al.[12]

CONCLUSION

This cross-sectional observational study was conducted on 52 individuals from Kolkata metropolis and its suburban towns, belonging to 6-18 years of age group and coming for estimation of age in the Department of Forensic and State Medicine of Medical College, Kolkata. The objective was to determine the correlation between chronological, dental and skeletal age by using visual inspection method of dental eruption/emergence for dental age estimation and comparison-based method of observing appearance and fusion of pre-determined ossification centres as per Galstaun's chart for skeletal age estimation. The outcome was that there was highly significant positive correlation between chronological vs dental, chronological vs skeletal and dental vs skeletal ages.

Thus, it can be concluded that method used for estimation of age in this study is still valid and reliable, though being simple and an age-old method.

Limitation of the Study and Recommendation

Limitation

- Small sample size which increases the chances of random error.
- For the purpose of statistical analysis, mainly for calculation of Pearson's correlation coefficient, we took the median of the estimated age range for both skeletal and chronological age.

Recommendation: Another similar study with larger sample size for the same population will yield more reliable outcome.

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ORIGINAL ARTICLE

Stature Prediction from Anthropometric Measurements of Palm and Finger in South Indian Population

Amjad Dastageer Mirzanaik[1], Samreen Panjakash[2], Karikalan T[3]

ABSTRACT

Introduction

Aim: To establish correlation between stature and palm lengths and individual finger length of both the hands in both males and females separately in South Indian population.

Settings and design: The present study was set up in the department of anatomy of Al Ameen Medical College, Bijapur. Among the volunteers, 300 healthy adults of age group 18-30 years were selected for the study.

Materials and Methods: Stature was measured using Standard Stadiometer and palm and finger length were measured using Vernier caliper.

Statistical analysis Used: Pearson's correlation coefficient and Regression equation formulas for stature estimation were calculated for all the parameters using trial version of SPSS software. Result:all the parameters displayed positive and significant correlation with stature in given population. Regression equations were calculated to estimate stature from given palm length or finger lengths.

Conclusion: There exists a definite correlation between stature with palm and finger length in both males and females included in the study.

.KEYWORDS | Stature; Correlation; Regression equation

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INTRODUCTION

As the world is developing, modern technology is at its pinnacle, with it came wars, mass disasters, natural disasters, terrorist attacks, etc creating a need to handle such situations with great efficacy. The onus lies on the law agencies and medico legal experts to solve the problems of identification which arises under these scenarios where multiple victims are involved.

Determining the stature of an individual from the dismembered body parts is one of the vital duties of a medico legal expert to aid in identification of an individual.

In forensic investigations, stature can be calculated by using either anatomical method or mathematical method. The anatomical method involves measuring and adding together the lengths or heights of a series of contiguous

skeletal elements from the skull through the foot to reconstruct of stature. This method has proved to be more precise to estimate the stature of victims of mass disasters, where the corpses are occasionally unidentifiable.[1]

Estimating statures through human remains is based on the principle that there is a linear relationship between statures and various parts of the human body and bones.[2] Based on the correlation, attempts have been made to establish the stature from the dimensions of almost all the body parts/ bones.[3]

The present study is undertaken to study the correlation between stature with individual finger length and palm lengths at the level of second to fifth finger separately in both males and females of South Indian population.

MATERIALS AND METHODS

The present study was set up in the department of anatomy of Al Ameen Medical College, Bijapur. 300 healthy adult 150 females and 150 males, of age varying from 18 to 30 years were selected after taking informed consent from all the participants.

Those individuals who are left handed subjects or subjects with skeletal abnormalities and connective tissue disorders, which may be congenital or acquired were exclude from the study.

METHOD OF COLLECTION OF DATA

Stature: Stature was measured as the distance from the utmost point of the crown of the head in the mid sagittal plane to the feet on flat surface using a standard Stadiometre. Subject was made to stand on the resting base of stadiometer, with palm turned inwards, fingers pointing vertically downward and the head positioned in Frankfurt Plane. The movable rod of the Stadiometer was brought in contact with vertex in the mid saggital plane.[4]

Palm Length and Finger Lengths were Measured as using Vernier Callipers

Palm length: It is the distance from the distal wrist crease to the proximal phalangeal ridge of the corresponding fingers.[5] (PL2 – palm length at index finger, PL3–palm length at middle finger, PL4–palm length at ring finger, PL5–palm length at little finger)

Finger Length: The subject is asked to place the hand on a flat table and the distance between the proximal phalangeal ridge to the most forward projecting point on the tip of fingers was noted.[6] (TL–thumb length, IFL–index finger length, MFL- middle finger length, RFL–ring finger length, LFL–little finger length)

Statistical Method Adopted: Initially for summarising the data, the Mean, Standard deviation (SD), Correlation coefficient (p) and value of Significance (r) are estimated and presented. Regression equations were derived to estimate stature from palm lengths and finger lengths using trial version of SPSS software 16.0.

RESULTS

The mean age of males was 20.11 years and that of females was 18.47years. The average height of males was 1680+/-63.2mm and that of females was 1564.1+/-59.2mm. (as in table 1)

Table 1: Table showing distribution of age (years) and height (mm) among study population.

		Mean	Standard deviation	Minimum	Maximum
Age	Males	20.11	1.34	18	22
	Females	18.47	5.92	18	22
Height	Males	1683	63.2	1570	1870
	Females	1564	59.2	1440	1700

Palm lengths at second and fifth digit showed negligent correlation coefficient value with stature, whereas there was significant correlation between palm length at third and fourth digit with stature in both males and females. Right hand palm length at third digit showed higher correlation coefficient with stature both in males(r=0.32, p=0.001) and in females(r=0.57, p=0.001). (as in table 2)

Table 2: Mean, Standard Deviation (SD), Regression Coefficient (r) and Significance value (p) for Palm length (in mm) among males and females included in study population.

		PL2	PL3	PL4	PL5
Males: Right Hand	Mean	93.87	101.1	95.85	84.97
	SD	4.63	4.35	4.25	9.23
	r	0.09	0.32	0.24	0.07
	p	0.1	0.001	0.001	0.02
Males : Left Hand	mean	92.22	98.44	93.63	84.6
	SD	5.48	4	4.29	4.67
	r	0.02	0.2	0.21	0.03
	p	0.1	0.002	0.001	0.1
Females:	mean	89.3	92.3	88.26	78.36
Right Hand	SD	5.33	5.57	6.04	7.65
	r	0.03	0.51	0.53	0.05
	p	0.1	0.001	0.001	0.1
Females :	mean	87.98	90.73	87.53	77.52
Left Hand	SD	5.66	5.56	5.87	5.67
	r	0.02	0.21	0.17	0.06
	p	0.2	0.001	0.002	0.12

(PL2 – palm length at index finger, PL3 – palm length at middle finger, PL4 – palm length at ring finger, PL5 – palm length at little finger)

Among males, right third digit length (r=0.47, p=0.001) and left second digit length (r=0.47, p=0.001) were better correlated with stature than other digit lengths. Among females, right third digit length (r=0.58, p=0.001) showed highest correlation with stature than other digit lengths. (as in table 3)

Table 3. Mean, Standard Deviation, Regression Coefficient and Significance value for finger length (in mm) among males study population.

		TL	IFL	MFL	RFL	LFL
Males: Right hand	Mean	56.98	74.78	83.65	79.47	60.53
	SD	6.22	7.54	8.32	8.48	4.95
	R	0.08	0.39	0.47	0.42	0.32
	P	0.1	0.003	0.001	0.001	0.002
Males: Left hand	mean	57.18	73.26	82.83	78.54	60.51
	SD	5.03	6.94	7.25	7.98	5.06
	r	0.07	0.47	0.44	0.41	0.3
	P	0.1	0.001	0.001	0.001	0.003
Female: Right hand	Mean	58.22	65.26	72.72	67.7	54.52
	SD	5.07	5.33	5.44	5.38	5.91
	R	0.1	0.5	0.58	0.53	0.5
	P	0.1	0.001	0.001	0.001	0.001
Females: Left hand	mean	57.14	65.03	72.27	66.7	53.74
	SD	5.25	6.37	5.44	5.41	5.46
	r	0.16	0.24	0.29	0.23	0.23
	P	0.04	0.001	0.001	0.004	0.003

(TL – thumb length, IFL – index finger length, MFL- middle finger length, RFL – ring finger length, LFL – little finger length).

Table 4: Regression Equations for calculating Stature from Palm lengths of Males and Females included in the study.

		Right hand	Left hand
Males	Height=	1564+0.12 (PL2)	1709+0.02 (PL2)
	Height=	1210.8+0.46 (PL3)	1365+0.32 (PL3)
	Height=	1340.5+0.35 (PL4)	1528+0.16 (PL4)
	Height=	1726+0.05 (PL5)	1518+0.19(PL5)
Females	Height=	1564+0.12 (PL2)	1709+0.02 (PL2)
	Height=	1210.8+0.46(PL3)	1365+0.32 (PL3)
	Height=	1340.5+0.35(PL4)	1528+0.16 (PL4)
	Height=	1726+0.05(PL5)	1518+0.19 (PL5)

Table 5: Regression Equations for calculating Stature from finger lengths of Males and Females included in the study.

		Right hand	Left hand
Males	Height =	1734+0.08 (TL)	1737+0.09 (TL)
	Height =	1436+0.33 (IFL)	1365+0.43 (IFL)
	Height =	1379+0.36 (MFL)	1360+0.38 (MFL)
	Height =	1433.8+0.31 (RFL)	1422+0.33 (RFL)
	Height =	1429+0.41 (LFL)	1453+0.37 (LFL)
Females	Height=	940.5+1.07 (TL)	1456+0.18 (TL)
	Height=	910.02+1 (IFL)	1418+0.22 (IFL)
	Height=	817++1.02 (MFL)	1408+0.21 (MFL)
	Height=	904+0.97 (RFL)	1389+0.26 (RFL)
	Height=	1067+0.9 (LFL)	142.9+0.24 (LFL)

DISCUSSION

Anthropometric studies on correlation of stature with different parts of the body have attracted many researchers across the globe.

In the past, scientists have used each and every bone of the human skeleton right from femur to metacarpals in estimation of stature. They all have reached a common conclusion that stature can be estimated with great accuracy even from the smallest bone.[3]

In the past, many researchers have correlated stature and various body fragments, but there are handful of studies on correlation and estimation of stature from palm length.

Salama (2013) conducted a similar study on stature estimation by using both actual hand measurements and hand print measurement in Egyption population. Using student t. test, it was concluded that there was significant sex difference for all hand parameters. There is no statistically significant difference between left and right hand measurements in both sexes. All hand measurements (including palm length) in both males and females are significantly correlated to stature (P=0.5). [7]

Pal et al. (2016) conducted a study on 1662 adult Bengalese women aged from 20 to 40 years. Palm length at the level of 3rd digit was measured. He concluded that, palm length was significantly correlated with the stature and there was no significant bilateral variation in palm length measurements. [8]

Ekezie et al. (2014) conducted a similar study in ethnic group of Nigeria. He concluded that palm length provides the highest reliability and accuracy in estimating stature. [9]

In the present study all the parameters of palm length showed significant correlation with the stature. Palm length at 3rd and 4th digit showed higher correlation with the stature in both male and female study population.

In a study, conducted by Kumar et al. (2014) on 200 medical students and staff of Mysore district of Karnataka, it was found that there exists Statistically significant correlation was observed between stature and middle finger length of both hands.[10]

Suseelamma et al. (2014) conducted a similar study correlating stature and finger length. It was concluded that a significant correlation was present between all the finger lengths and stature in both males and female study subjects. Pearson correlation between finger length and stature was higher among males than females height and length of the fingers of the hand were significantly more in males compared to females. [11]

In the present study, all the finger lengths have shown positive correlation with stature in both male and female study subjects ($p< 0.1$). The mean finger length in males was higher than in females included in the study (Males mean finger length: 56.98mm-83.65mm in right hand and 57.18mm-82.83mm in left hand) (females, mean finger length : 54.52mm-

72.72mm in right hand and 53.74mm-72.27mm in left hand).

CONCLUSION

The anthropometric measurements fluctuate in different sex and ethnic groups which can be determined by genetic and environmental elements suggesting the need for different normograms for different populations.

These varieties of researches are of anthropological importance because it facilitates to understand the distinction among populace. If the study is repeated on the identical population group after numerous years, it will assist to perceive the micro evolutionary changes. In addition it facilitates forensic evaluation in organizing identification of individual in question, where in stature is one of the primary traits of identification.

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ORIGINAL ARTICLE

Correlation between Lip Print and Skeletal Malocclusion

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ABSTRACT

Introduction:

Lip prints, like fingerprints, are unique to each person and are simple to record. Cheiloscopic analysis has been demonstrated to be effective in both judging deformity and identifying individuals. Many studies have been conducted on lip prints and its relationship with individual's skeletal pattern.

Aim: The goal of this study was to see if there was a link between lip print and skeletal malocclusion, as well as how reliable it was as a forensic tool for identifying people.

Material & Method: Lip prints were collected from 180 people, 60 of whom were from Kerala, 60 from Karnataka, and 60 from Kodagu, regardless of their dental class I, class II, or class III malocclusion. Lip prints were captured using the lipstick cellophane method and categorised using Tsuchihashi's categorization system: Type I, Type I', Type II, Type III, Type IV, Type V.

Results: We have noticed that the most common lip pattern among Karnataka and Coorg Population was type II and in Kerala population was type I.

Conclusion: We conclude our research by stating that lip prints are a useful and important diagnostic tool for identifying individuals of various ethnic backgrounds, and that there is a strong correlation between skeletal growth patterns of various ethnicities and their lip patterns.

.KEYWORDS | Cheiloscopy; Lip prints; Skeletal malocclusion; Forensic tool

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INTRODUCTION

Cheiloscopy comes from the Greek words "cheilos" (lips) and "skopein"(study). Individuals' fingerprints and palatal rugae are both unique, so is their lip print.[1] Individual lip print uniqueness also reveals a strong familial trend.

Skeletal malocclusion (Class I, Class II, and Class III) and soft tissue face morphology have been the subject of extensive investigation.[2] Lip prints can be compared to oral clefts, individual periodontal conditions, malocclusion, and premalignant lesions.[3]

The purpose of this study was to examine if there was a link between different cheiloscopic patterns and the skeletal growth pattern in different ethnic backgrounds.

MATERIALS AND METHODS

The current study included 180 people aged 18 to 40 years old, divided into three groups: 60 people from Kodagu, 60 people from Karnataka, and 60 people from Kerala they are selected based on the clinical examination for skeletal growth pattern with 2 finger method (Fig 1).

Fig. 1: Clinical Examination for skeletal growth pattern

The lips of the participants were washed thoroughly and clinically examined for any malformations, scars, or anomalies. The examination focused on lips that were free of all these abnormalities. The many methods for recording lip prints include the lipstick paper cardboard method, photography, lipstick paper method, lipstick cellophane method, and employing dental impression materials to generate three dimensional casts of the lips. This study used the lipstick cellophane method, which produced good clarity and precision of the lip print.

Inclusion criteria

- Patients with skeletal patterns of class I, class II, and class III.
- Sixty individuals from Karnataka population, Sixty individuals from Kerala population and Sixty individuals from Kodagu population.

Exclusion criteria

- Patients with cleft lip
- Deformities of lip
- Scar on lips

MATERIALS USED IN THE STUDY

A. Bard-Parker knife (No. 15)
B. Lipstick (ELLE 18 -Red spin)
C. Ear buds
D. Bond paper
E. Magnifying lens
F. Cello tape.
G. Dappendish
H. Makeup remover (calorescence)

METHODS TO RECORD LIP PRINT

The participants were invited to sit in a relaxed position on a dentist chair, and their lips were cleansed with damp cotton. Then, using a bard parker knife, a quantity of red lipstick was cut and placed in the dappen dish, from which it was applied to the lips using ear buds. The participants were told to touch their lips together to spread the lipstick. The glued portion of the cellophane tape strip was placed over the lipstick, and a lip impression was made by dabbing it first in the centre and then uniformly pressing it towards the lips' corners. After the cellophane strip was glued to the white bond paper for permanent documentation, the lip impressions were examined with a magnifying lens. Every precaution was taken to avoid cross contamination. (Fig 2)

Fig. 2: A-Typel,B-Type II,C-Type III and D-Type IV.

Analysis of lip print

In the Department of Oral Pathology, the lip impressions were next seen using a magnifying lens. As proposed by Sivapathasundharam et al., the centre region of the lower lip, 10 mm wide, was used as the study area for classification.[2]

Many authors have classified the lip patterns, we have followed the most widely accepted and

used lip print pattern given by Tsuchihashi[4] where he has divided into 6 types according to the grooves:

- Type I – Complete vertical groove
- Type I – Partial vertical groove
- Type II – Branched groove
- Type III – Intersecting groove
- Type IV – Reticular groove
- Type V – Undetermined groove

STATISTICAL ANALYSIS

1. The data was collected, coded, and fed in SPSS (IBM version 23) for statistical analysis.
2. Descriptive statistics included frequency.
3. Inferential statistics included Chi square test to find out the association between the variables.
4. The level of significance was set < 0.05 at 95% confidence interval.

RESULTS

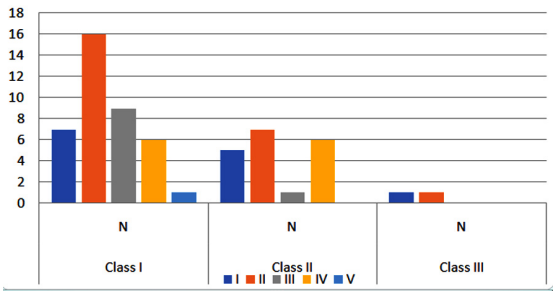
Table 1: Cheiloscopic pattern vs skeletal growth pattern of individual in Karnataka population

Cheiloscopic Pattern	Class I		Class II		Class III		P-Value
	N	%	N	%	N	%	
I	7	17.9	5	26.3	1	50.0	
II	16	41.0	7	36.8	1	50.0	
III	9	23.1	1	5.3	0	0	.570
IV	6	15.4	6	31.6	0	0	
V	1	2.6	0	0	0	0	

INTERPRETATION

Table 1 and Graph 1 shows the lip pattern correlation with skeletal relation in a Karnataka population.

1. In a Class I Skeletal growers type II lip pattern was predominant in 41.0% of total population, followed by type III in 23.1% and I lip patterns in 17.9% of population.
2. In a class II Skeletal growers, type II was predominant accounting for 36.8% followed by type IV in 31.6% and type I in 26.3% of population.
3. In a class III skeletal growers' type I and type II were seen equally.



Graph 1: Cheiloscopic pattern vs skeletal growth pattern of individual in Karnataka population.

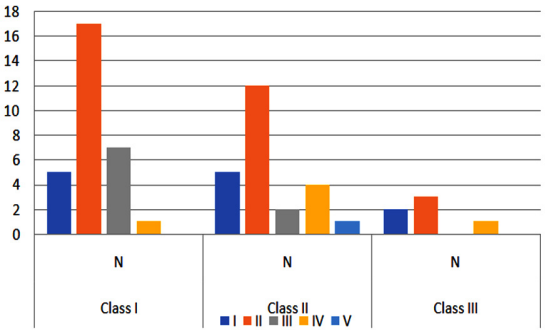
Table 2: Cheiloscopic pattern vs skeletal growth pattern of individual in Coorg population.

Cheiloscopic Pattern	Class I		Class II		Class III		P-Value
	N	%	N	%	N	%	
I	5	16.7	5	20.8	2	33.3	
II	17	56.7	12	50.0	3	50.0	
III	7	23.3	2	8.3	0	0	.433
IV	1	3.3	4	16.7	1	16.7	
V	0	0	1	4.2	0	0	

INTERPRETATION

Table 2 and Graph 2 shows the relationship between lip pattern and Skeletal growth pattern of individual in a Coorg population.

1. In a Class I skeletal growers type II lip pattern was predominant in 56.7% of the population, followed by type III lip pattern in 23.6% of population.
2. In a class II skeletal growers, the most common lip pattern was type II, which accounted for nearly 50.0% of population, followed by type I which accounted for 20.8% of population.
3. In a class III skeletal growers, type II lip pattern in 50.0% of the total population followed by type I in 33.3% of the population.



Graph 2: Cheiloscopic pattern vs skeletal growth pattern of individual in Coorg population.

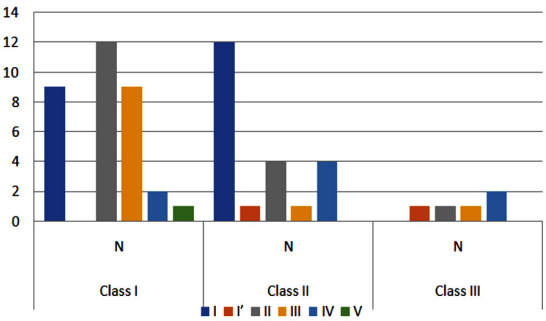
Table 3: Cheiloscopic pattern vs skeletal growth pattern of individual in Kerala population.

Cheiloscopic Pattern	Class I		Class II		Class III		P-Value
	N	%	N	%	N	%	
I	9	27.3	12	54.5	0	0	
I	0	0	1	4.5	1	20.0	
II	12	36.4	4	18.2	1	20.0	.024
III	9	27.3	1	4.5	1	20.0	
IV	2	6.1	4	18.2	2	40.0	
V	1	3.0	0	0	0	0	

INTERPRETATION

Table 3 and Graph 3 shows the relationship between lip pattern and Skeletal growth pattern of individual in a Kerala population.

1. In a Class I skeletal growers type II lip pattern was predominant in 36.4% of the population, followed by type I and type III lip pattern in 27.3% of population.
2. In a class II skeletal growers, the most common lip pattern was type I, which accounted for nearly 54.5% of population, followed by type II and type IV in 18.2% of population respectively.
3. In a class III skeletal growers, type IV lip pattern was seen in 40.0% of population.



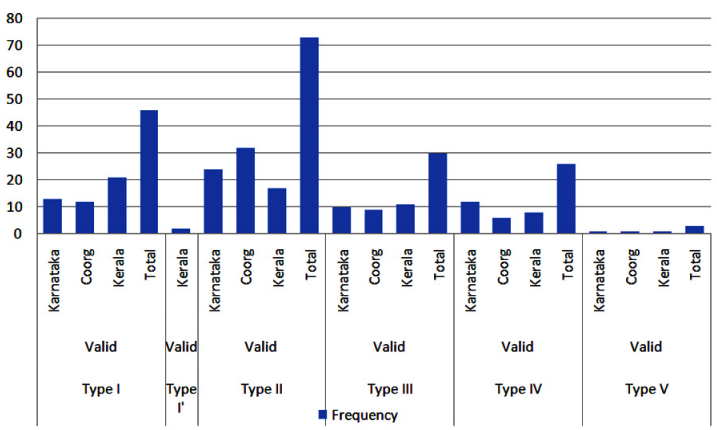
Graph 3:Cheiloscopic pattern vs skeletal growth pattern of individual in Kerala population

Table 4: Frequency of Lip pattern in all 3 populations irrespective of skeletal growing pattern of the individuals.

		Place				
Lip_Pattern_Recoded			Frequency	Percent	Valid Percent	Cumulative Percent
Type I	Valid	Karnataka	13	28.3	28.3	28.3
		Coorg	12	26.1	26.1	54.3
		Kerala	21	45.7	45.7	100.0
		Total	46	100.0	100.0	
Type I'	Valid	Kerala	2	100.0	100.0	100.0
Type II	Valid	Karnataka	24	32.9	32.9	32.9
		Coorg	32	43.8	43.8	76.7
		Kerala	17	23.3	23.3	100.0
		Total	73	100.0	100.0	
Type III	Valid	Karnataka	10	33.3	33.3	33.3
		Coorg	9	30.0	30.0	63.3
		Kerala	11	36.7	36.7	100.0
		Total	30	100.0	100.0	
Type IV	Valid	Karnataka	12	46.2	46.2	46.2
		Coorg	6	23.1	23.1	69.2
		Kerala	8	30.8	30.8	100.0
		Total	26	100.0	100.0	
Type V	Valid	Karnataka	1	33.3	33.3	33.3
		Coorg	1	33.3	33.3	66.7
		Kerala	1	33.3	33.3	100.0
		Total	3	100.0	100.0	

INTERPRETATION

Table 4 and Graph 4 shows the frequency of lip pattern in all 3 populations irrespective of skeletal growing pattern of the individuals - We have noticed that the most common lip pattern among Karnataka and Coorg Population was type II and in Kerala population was type I.



Graph 4: Frequency of Lip pattern in all 3 populations irrespective of skeletal growing pattern of the individuals

DISCUSSION

Occlusion develops because of the interaction and synergistic impact of genetic and environmental factors. The impact of a given environmental influence on phenotypic varies based on genetic background, which in turn impacts facial and tooth appearance.[5] The lip, alveolus, and palate all develop fully during the first 6–12 weeks of pregnancy[6] or the 24th week of intrauterine life, and they all come from the same embryonic source.[5] It is well understood that any factor present now of genetic expression will have an impact on all structures forming at the time.

Any factor that has an impact on the development of one structure will eventually have an impact on the development of all the other structures that develop alongside it. As a result, there's a potential that alveolus-related developmental changes will show up in cheiloscopic patterns. The skeletal malocclusion was studied using several cheiloscopic patterns. Lip prints are one-of-a-kind, and the originality of patterns is determined by how the lip muscles relax to create a certain pattern.[2] As a result, they play a critical role in forensic identification.

Type III lip prints are more common in Japanese and Indo-Dravidian people but branching and type IV lip patterns are more prominent in North Indian and Malayalam populations.[2,4] This revealed that race or regional distribution could influence the pattern of lip prints.

Our findings contrast those of Vahanwalla and Parekh, who found a high prevalence of the type 1 lip pattern in the Mumbai community.[7]

Our findings contradict those of Verghese et al., who found that type IV lip pattern was the most common in the Kerala population.[8]

Our findings are consistent with those of Sivapathasundharam et al, who found that most Indo-Dravidians have a type II lip pattern.[2]

Our findings corroborate those of Kaushal et al., who found that the type II lip pattern was the most common (30%), while the type V lip pattern was the least common (10%).[9]

In his study, Raghav et al found that in different skeletal malocclusions, type II was most prevalent in class I skeletal malocclusion subjects, which is similar to our findings in all three ethnic origins (Karnataka, Coorg, and Kerala), while class II subjects showed type II as the most prevalent type of lip print patterns,[10] which is similar to our findings in Karnataka and Coorg populations, but the most prevalent lip pattern noticed in Kerala population was type I.

The patients in our study were chosen based on clinical evaluation without considering the aetiology, such as hereditary or environmental factors. More research is needed to confirm the link between lip patterns and skeletal malocclusions in a larger sample of persons of various ethnicities, considering hereditary and environmental determinants of malocclusions. Each patient's lip print pattern or fingerprint pattern profiling can also be recorded and maintained in his personal database for identification purposes. Because our lip print pattern develops early in infancy, the type of malocclusion can be predicted in advance to ensure that preventive and interceptive orthodontic procedures are completed successfully.[11]

CONCLUSION

A recent clinical investigation discovered a substantial link between an individual's skeletal pattern and their lip patterns.

The following are the study's principal findings:

1. Karnataka Population: In a Class I Skeletal growers and class II Skeletal growers type II lip pattern waspredominant and, in a class III, skeletal growers' type I and type II were seen equally.
2. Coorg Population: Irrespective of theskeletal growth pattern all the individuals showed a type II lip pattern predominantly.
3. Kerala Population: In a Class I skeletal growers type II lip pattern was predominant, in a class II skeletal growers, the most common lip pattern was type I and, in a class III, skeletal growers, type IV lip pattern was seen predominantly.

Considering the above findings, we conclude our research by stating that lip prints are a useful and important diagnostic tool for identifying individuals of various ethnic backgrounds, and that there is a strong correlation between skeletal growth patterns of various ethnicities and their lip patterns.

Conflict of Interest:
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ORIGINAL ARTICLE

Trends of Poisoning at Belgaum Institute of Medical Sciences, Belagavi: A Prospective Study

Rashmi KS[1], Jagadish Rao Padubidri[2], Ashok Kumar Shetty[3]

ABSTRACT

Introduction:

Poisoning is an important public health problem causing significant morbidity and mortality throughout the world especially in the developing countries. The cause for unintentional deaths due to poisoning may be due to easy availability and unsafe storage of poisonous substances like pesticides, insecticides etc. Modern day stressful life style may be the cause for such intentional poisoning. Pattern of poisoning in a region depends upon various factors, ranging from availability and access of poison to the socio-economic status of the individual. The present prospective study is undertaken to determine the burden of morbidity and mortality of poisoning cases at tertiary hospital of this region and to demonstrate the socio-demographic profile.

Material and Methods: A cross-sectionalstudy was conducted on all cases of poisoning admitted and/or autopsied at Belgaum Institute of Medical Sciences (BIMS) Hospital, Belgaum, during a period spread over 18 months. Information about the victims, the type of poison, manner of poisoning are obtained from hospital records, police records and by direct interrogation with the relatives and others accompanying the victim & chemical examiner's report (Regional Forensic Science Laboratory).

Results: Out of 9068 admitted patients, 804 cases were of poisoning, 706 patients were admitted to medical ward and 98 victims were declared brought dead to casualty. Out of 706, 568 patients were recovered and discharged and 138 victims expired. In our study mortality rate is 19.5% and morbidity is 7.78%. Peak occurrence was in the age group of 20-29 years (39.30%). Male predominance was seen (64.1%). Most of the victims are rural habitant (65.54%) and involves upper lower class group (40%). Hindu population was most affected (92.78%). More cases were reported during winter season (50.12 %). Present study shows 93.15% cases are suicidal in nature, accidental poisoning constituted 5.59 % and 1% of homicidal cases of total number of cases. Insecticides accounts for 57.96% in that organo phosphorous compounds constitutes (68.24%).

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CONCLUSION: The commonest poisoning agent was Organ phosphorus. The occurrence was high among married males and in the age group of 20–29 years. Maximum number of cases was reported during winter season. The incidence of poisoning and its morbidity and mortality can be reduced by developing and implementation of effective prevention strategies.

KEYWORDS | Poisoning; Insecticides; Mortality; Morbidity; Organ phosphorus

INTRODUCTION

Poisoning is a major epidemic of non-communicable disease in the present century. Among the unnatural deaths, deaths due to poisoning come next only to road traffic accident deaths. In earlier times, the poisoning deaths from pesticides were mainly accidental but easy availability, low cost and unrestricted sale have led to an increase in suicidal and homicidal cases as well. Pesticides which were invented to protect crops from rodents, insects and humans from starvation have themselves become an important contributor to unnatural deaths.[1] It can be intentional or unintentional. Globally self-poisoning with pesticides accounts for about a third of all suicides worldwide.[2] In many agricultural communities of low and middle income countries, pesticide self-poisoning accounts for a large proportion of these deaths.[3] According to World Health Organization (WHO), globally more than three million of acute poisoning cases with 2,20,000 deaths occur annually.[4] It has been estimated that, in India five to six persons per lakh of population die due to acute poisoning every year.[5]

In India, as agriculture is the main occupation, insecticides and other agrochemical fertilizers are used to a greater extent and the poisoning with such products are more common.[6] A comparative data revealed that in developed countries the mortality rate due to poisoning is only 1% to 2% but in developing countries like India it varies between 15% & 30% and is the fourth main cause of mortality in rural India.[7] According to NCRB, 19,445 persons committed suicide by consuming poison. Tamil Nadu topped the list with 3,459 cases, followed by Karnataka with 3,173 cases8. On an average of 84 deaths per day occur due to Poisoning was noticed.[9]

Pattern of poisoning in a region depends on various factors which include availability and access to the poison, socioeconomic status of an individual, cultural and religious influences, etc. Knowledge of general pattern of poisoning in a particular region will help in early diagnosis and treatment of cases, thus decreasing the rate of mortality and morbidity. Information available in our locality with regard to acute poisoning in adults is limited. Hence this present study was carried out with the aim to find out the pattern of acute poisoning in adults in our tertiary care hospital, to evaluate the mortality and morbidity burden of poisoning cases and to demonstrate the socio-demographic profile related to poison cases.

MATERIAL AND METHODS

This cross-sectional study was carried out on the victims/patients of poisoning cases brought to casualty and mortuary of Belgaum Institute of Medical Sciences (BIMS), Belagavi from November 2012 to April 2014. Data was analyzed prospectively. All the cases with history of poisons which were admitted and/or autopsied at BIMS Hospital, Belagavi were included in the study, whereas poisoning due to animal bites and idiosyncratic drug reactions were excluded. Data was analyzed prospectively in repect to the socio-demographic profile of poisoning cases in each age group, sex, socio economic status, type of the poison, mode, place of occurrence, history of first aid treatment, reference and final outcome of patient.

RESULTS AND OBSERVATIONS

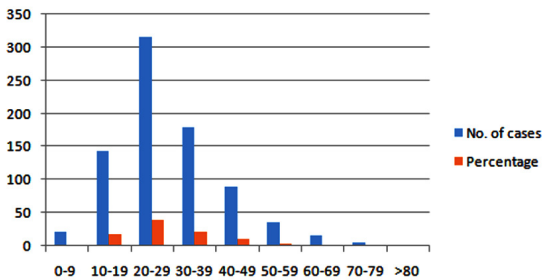
During the study period from November 2012 to April 2014, a total of 804 poisoning cases

were studied which came to the casualty of Belgaum Institute of Medical Sciences (BIMS) hospital. Among them 98 cases were declared brought dead and 706 were admitted. During the same period about 9068 patients were admitted in the medical ward which included the 706 patients of poisoning cases making the morbidity burden of poisoning to 7.78%.

In our study out of the total, maximum number of cases 516 (64.1%) were male and 288 (35.82%) cases were female. The ratio of male: female is 2:1.

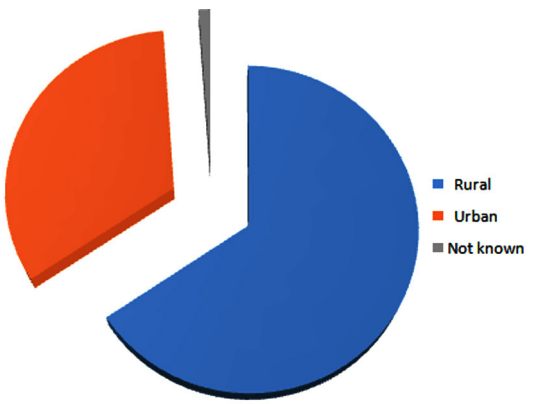
In the present study maximum number of victims 316 (39.30%) were in the age group of 20-29 years, followed by 179 (22.26%) who were in the age group of 30-39 years (Graph.1)

Graph 1: Distribution of poisoning cases according to age:



In the present study, the distribution of domicile pattern of the victims showed that 527 (65.54%) were fromrural areas and 267 (33.20%) cases were from urbanarea (Graph no. 2)

Graph 2: Distribution of poisoning cases according to domicile pattern.



Maximum number of patients 746 (92.78%) belonged to Hindu religion, with other religion constituting to a minimal of 7.21% . Maximum number of patients 77% were literates and 23% were illiterates. Manner of death in poisoning cases are depicted in Table 1.

Table 1: Distribution of poisoning cases according to manner of death.

Manner	Number of cases	Percentage
Suicidal	749	93.15%
Accidental	45	5.59%
Homicidal	10	1.24%
Total	804	100%

The distribution of the poisoning cases as per the socioeconomic status and seasonal variation is depicted in the Table 2 & 3.

Table 2: Distribution of poisoning cases according to Socio economic status.

Socio Economic status	Number of cases	Percentage
Upper Class – I	33	4.10%
Upper Middle Class- II	85	10.57%
Lower Middle Class-III	178	22.1%
Upper Lower Class - IV	323	40.1%
Lower Lower – V	185	23.0%
Total	804	100%

Table 3: Distribution of poisoning cases according to seasonal variation.

Season	Number of cases	Percentage
March- June	200	24.87%
July- Oct	45	25.00%
Nov- Feb	403	50.12%
Total	804	100%

Mortality Rate: Among the 804 cases in our study, 706 (87.81%) cases were admitted to the hospital and 98 (12.1%) cases were brought dead to casualty. Among the 706 admitted patients of poisoning, 568 (80.45%) patients recovered and were discharged, while 138 (19.54%) casessuccumbed to the poisoningaccounting to a mortality rate of 19.54% overall as shown in Table 4.

A total of 1167 autopsies were conducted during 18 months of study period at BIMS mortuary, among which 236 were of poisoning cases accounting for 20.22% of total autopsied cases. Duration of survival period in admitted and autopsied cases are depicted in Table 5.

Table 4: Distribution of cases according to outcome as per mortality

Total no. of poisoning cases	Brought dead to casualty		Admitted			
			Recovered and discharged:		Expired	
804	98	12.1%	568	80.45%	138	19.54%

Table 5: Distribution of Survival Period in admitted and autopsied cases.

Survival period	Number of cases	Percentage
Less than 6 hrs	48	20.33%
6 hrs – 24hrs	07	2.96%
1 day- 3days	68	28.81%
3 – 5 days	04	1.69%
5- 7 days	07	2.69%
More than 7 days	04	1.69%
Total	138	100

Most common group of poison encountered in our study was Insecticide 57.96% Then death rate was higher (6.09%) in those who co-ingested alcohol with Organo phosphorous compound(OP). Among the insecticide group of poisoning 68.24% of cases were due to Organo phosphorous compound, followed by Lice powder (Diazinon) 9.65% and least was Imidaclopramide 2.14 % as shown in Table 6 & 7.

Table 6: Distribution of poisoning cases according to Poison Consumed.

Poison	No. of Cases	Percentage
Insecticide	466	57.96 %
Alcohol + OP	49	6.09 %
Rodenticides	34	4.22%
Corrosives	31	3.85%
Tablets (Phenobarbitone, analgesic,	–	–
Antihypertensive, sedative)	32	3.98%
Fuel & its product (kerosene, petrol, diesel)	26	3.23%
Undiagnosed	25	3.10%
Alcohol intoxication	28	3.48%
Herbicide	19	2.36%
Other tab	12	1.49%
Plant irritant	–	–
(Ricinuscommunis)	09	1.11%
Negative	56	6.96%
Awaited	23	2.86%
Total	804	100

Table 7: Patterns of Insecticides Poisoning.

Season	Number of cases	Percentage
Organo Phosphorous	318	68.24%
Lice powder (Diazinon)	45	9.65%
Chlorinated Hydrocarbon	32	6.86%
Cypermethrine	22	4.72%
Carbamates	05	1.07%
Chloropyrifos	14	3.00%
Pyrethroids	20	4.29
Imidaclopride	10	2.14
Total	466	100

With increasing work stress and life style changes, people are under constant pressure

DISCUSSION

and develop depression and suicidal tendencies. So it is not surprising that the incidence of self poisoning is on rise. Therefore it is important to know the socio-demographic trend and substances commonly used in that area.

Sex: In our present study males were the majority in overall comprising (64.1%) of the case load (35.82%) cases were of female. The ratio of male: female is 2:1. The high incidence may be because males are more exposed to stress, strain and occupational hazards compared to females. The reason for this can be attributed to the fact that males form a majority of the population going out for work, and since the burden of earning for a livelihood

are on them. Our findings are in accordance with the study conducted by Vinod Go vsavi et al[10], Kanchan T et al,[11]Gurudut K S et al,[12] Sanjeev Kumar etal,[13] SubashVijaya kumar,[14] Shetty AK[15]and Andrew H et al.[16] Whereas the study conducted in Moodabidri and Nepal by SadanandaNaik et al[17] and Amarnath Mishra et al[18] showed female predominance.

Age: In our study it was observed that majority of the case load was in the age group of 20-29yrs constituting to (39.30%) of the overall cases which is a major bulk of the population, followed by (22.26%) of the total cases in the age group of 30-39 years which is the major bulk of reproductive age group. Above 80 years of age there was hardly (0.12%)of casesThis can be explained by the fact that young age group of 21 to 29 yrsie. adolescent and young adults are at more risk. The attributed factors like failure in facing the difficulties of academics, unemployment, romantic failure, family conflicts, and marital disharmony all play a part and improper judgment of the problem, dowry harassment are common in case of female in case of adolescence scolding by parents for very trivial issue and failure or less percentage in exams were the reasons being noticed. Study conducted by Gurudutt et al[12], Tejasprajapathi et al[19], Shetty AK et al[15] and Mahabaleshshettietal[20] showed increase in the case load in the age group of 21-29 years, whereas there was variation in the age group in the studies conducted by SadanandNaik et al (12-25 yrs)[17], Amarnath Mishra et al (16-30 yrs)[18] and Unnikrishnan et al (21-40 yrs).[21]

Domicile Pattern: Our study witnessed more number of cases (65.54%) from rural background around Belgaum. This may be due to the fact that as BIMS hospital is a tertiary referral center where the patients are referred from surrounding Belgaum for further treatment and management. Urban constituting 33.20% of the case load and 1.11% remains not known in unidentified deceased. Few studies show urban predominance, the reason being due to rapid urbanization leading to stiff competition, lack of employment opportunities, economic instability, work load, mental stress, mechanical life and high cost of living in urban setup.

Religion: Majority of the poisoning cases 746 (92.78%) in our study belonged to Hindu religion. This can be explained as the majority of population in India are Hindus. No significant correlation could be drawn and there is no comparative data available from others' studies.

Education: In our study 23% of populations are illiterates and 77% are literates. Even though maximum population in our study are literates, poisoning are common and may be due to financial crisis, personal disharmony, heavy competition, unemployment, unable to take judgement, psychological stress etc.

Manner of Poisoning: The present study shows 93.15% cases suicidal in nature, accidental poisoning constituted 5.59 % and 1% of homicidal cases. Suicide by poisoning is the most popular form of death because poisons are easily available commercially from any stores or may be taken even at home like house hold poisons, which can be mixed with food, sometimes causes presumably painless death. Modern techniques of sample analysis and establishedmeans of detecting poison are thought to be responsible forthe fall in homicidal poisoning mortalities throughout India .[11]

Socio Economic Status: In the present study it was found that 40% were from upper lower class and least in upper class 4.10%. The suicidesin upper lower class may be due to various stress factors coming from financial, social, family problems, low level of education, immaturity, Easy availability of poisons, lack of knowledge about the deleterious effects of the pesticides make them easy victims also.

Seasonal Variation: Our study showed that the maximum number of cases were seen in the month of November to Februarywith 50% of incidence followed by 25% in July to October and 24.87% in March to June. The reason for the increase in the case load during the month of November to February could not be reasoned out.

Mortality Rate: Among the 706 admitted patients of poisoning, 568 (80.45%) patients recovered and were discharged, while 138

(19.54%) patients expired accounting to a mortality rate of 19.54% overall. Our study showed high mortality rate when compared to study conducted at Mangalore[21], Belgum[12], Bagalkot[22], Moodabidri[17] and Dharwad.[20] In this present study probably higher mortality rate may be due to the fact that the patients might have reached/ referred in their end stage, lack of poison detection center, lack of proper history, diagnosis, investigation, initiation of treatment in acute poisoning cases.

Common type of Poison consumed: In this present study most common poison encountered was insecticide (57.96%) followed by of alcohol with Organo Phosphorous substances (OP) (6.09%). Among insecticides, Organophosphrous compound constitutes 68.24%. The reason behind is as Belgaum being developing district, agriculture remains a main occupation in some parts of it. Insecticides and other agrochemical fertilizers such as Organophosphrous compounds are used to a greater extent and the poisoning with such products are more common. Insecticides are easily available in any stores and of relatively low cost and which are commonly and irrational used without knowledge about the toxicity and side effects of OP which makes the victim easily succumb.

Organophosphates were implicated in majority (68.24%) of the mortalities This attributes to the fact that organophosphates continue to be themost commonly used agrochemicals in Southern India. Our findings are similar to other studies in the table except some studies in Northern India like Punjab, Aligrahetc as North India is a predominantly agricultural region and therefore, Aluminium phosphide was found to be the most common used and cause for acutepoisoning with high mortality, due to its high fatality ratespecially because of the non-availability of specific anti-dote and easy procurement.

CONCLUSION

Out of total 804 cases, 706 cases was admitted which constituted 7.78% of the morbidity rate when calculated among the cases which came to our tertiary care centre. The Mortality rate was 19.5%. Mortality rate is high in our study when compared to other studies, to reduce this, early diagnosis and better timely treatment should be initiated. Morbidity of the poison in our area can be cut down by the prevention of suicides in the society. The common group of poison was insecticides, in that commonest wasOrgano phosphorous compounds. The morbidity and mortality can be reduced by developing and implementing effective prevention strategies. Our study suggests that there is need for more strict legislations and implementation of rules, regulations, and safety measures.

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ORIGINAL ARTICLE

Histopathological Spectrum of Upper Gastrointestinal Tract Endoscopic Biopsies

Tushar Kambale[1],Rumaanah Khan[2], Komal D Sawaimul[3], Sanjay Gaiwale[4], C R Gore[5], Banyameen Iqbal[6]

ABSTRACT

Introduction:

Upper GI diseases (lesions) are frequently seen in clinical practice. These are associated with mortality and morbidity in patients with GI lesions. Early diagnosis of inflammatory disorders, infectious diseases, physical, mechanical and toxic reactions and neoplasms of upper gastrointestinal tract is possible with endoscopic biopsies with its histopathological correlation.

Materials and methods: This prospective study was carried out on 162 patients in Dr. D.Y. Patil Medical college, Hospital and research centre, Pune for a period of 2 years from June 2019-2021. Biopsy specimens were fixed in 10% formalin and routinely processed in Haematoxylin & Eosin stain. Results: A total of 250 biopsy samples were obtained from 162 patients of which 188(75%) were from Stomach, 33 (13%) from Duodenum, 25(10%) from Esophagus and 2% from gastro esophageal junction. Maximum biopsies were carried out in the age group of 31-40 years. 149 (64.19%) of biopsies were from males and 101 (35.8%) were from females. Among the total cases, 140 (86.41%) were non neoplastic lesions whereas 22 (13.58%) were neoplastic lesions. Epigastric pain seen in 71 (43.8%) was the commonest symptom ofupper gastrointestinal lesions.

Conclusion: The upper GI endoscopy helps in early detection of several mucosal lesions, diagnosis of malignancies at early stages and of clinically suspected lesions leading to prompt treatment.

KEYWORDS |Upper Gastrointestinal tract lesions; Endoscopic biopsy; Histopathological examination; Squamous cell carcinoma; Adenocarcinoma.

Author's Credentials:

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INTRODUCTION

Upper Gastrointestinal diseases (lesions) are frequently encountered in clinical practice and are associated with high morbidity and mortality in patients with gastrointestinal lesions. Ability to assess the gastrointestinal tract with the help of an endoscope has increased the accuracy and early his to logic determination of mucosal lesions.[1] It helps in generating biopsies from the sites that were previously inaccessible, without

the major surgeries. Several pathological lesions like inflammatory disorders, infectious diseases; physical, mechanical and toxic reactions and neoplasms can affect the upper gastrointestinal tract.[2] Endoscopic mucosal biopsies are regarded as effective modality of investigation as well as treatment for most patients with upper GI symptoms.[1] Early clinical diagnosis of the above mentioned lesions is possible with endoscopic biopsies along with its histopathological diagnosis. Now, Endoscopy has be comeincomplete without biopsy for histopathological examination.[3] It is thus considered as an excellent diagnostic tool in diagnosing various upper GI pathologies.[1-4]

The present study determines the spectrum of Histopathological lesions of up pergastrointestinaltract encountered at tertiary care hospital in urban industrial area and to determine endoscopic biopsiesasan effective tool in the diagnosis and treatment of various upper gastrointestinal lesions.

MATERIALS AND METHODS

This Prospective study was conducted in the Department of Pathology, Dr. D.Y. Patil medical college, hospital & Research centre, Pune from June 2019-2021 (2 years). Endoscopic procedures were performed by gastroenterologist and biopsies were obtained from esophagus, stomach till the second part of duodenum. A total of 250 upper gastrointestinal tract endoscopic biopsies from 162 patients were evaluated with complete personal details, history, clinical examination and endoscopic findings.

Inclusion Criteria: All the endoscopic biopsies of esophagus, stomach till the second part of duodenum.

Exclusion Criteria: 1. All the lesions of mouth and pharynx. 2. All the duodenal biopsies beyond 2nd part of Duodenum.

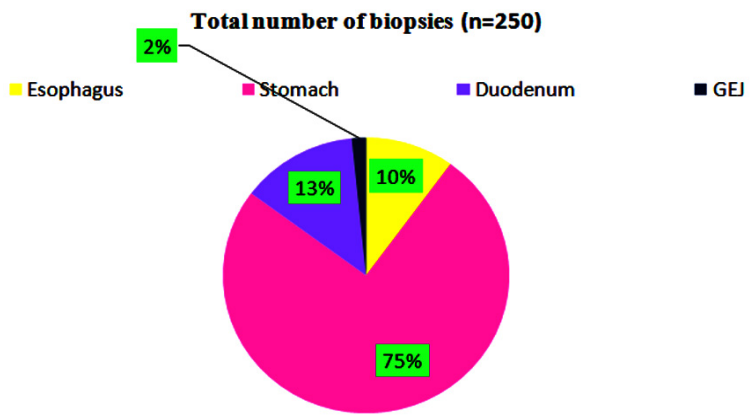
RESULTS

All the biopsy samples were fixed in 10% formalin, followed by conventional tissue processing and embedding. 4 micron thick sections were cut and slides were prepared. Serial sections were stained with haematoxylin and eosin and examined. Additional sections were stained with Giemsa stain to observe H. Pylori. IHC was performed wherever required. Lesions were classified according to Histopathological examination and WHO grading & other classifications were applied whenever necessary.

Written informed consent was obtained from all the patients. This study with Ref. No. I.E.S.C./285/2019 was approved by the Institutional Ethics Sub-Committee.

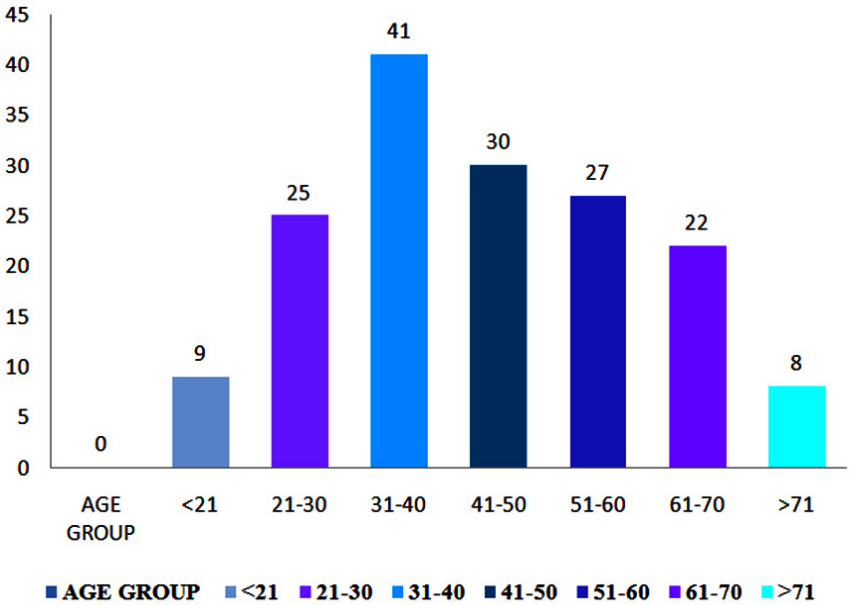
In this present study, atotal of 250 biopsies were obtained from162 patients, out of which 74 patients had as inglebiopsy sample and 88 patients had more than one biopsy sample. 188 (75%) biopsies were from stomach, followed by 33(13%) biopsies from duodenum, 25(10%) biopsies from esophagus and 4(2%). biopsies from Gastro esophageal Junction (Chart no 1).

Chart 1: Site wise distribution of upper GI endoscopic biopsies:(n=250).



Among 162 patients, 41(25.3%)patients were in the age group of 31 - 40 years followed by 30 (18.51%) patients in the age group 41 - 50 years. Age group of <21 years had 9 (5.55%) patients, whereas age group >71 years had 8(4.93%) patients making them the least common age groups (Chart no 2).

Chart 2: Distribution of upper GI endoscopic biopsy according to Age (n=162).



Of the total 250 biopsies, 149 (60%) were from males and 101 (40%) from female patients showing a higher male preponderance. Male: Female ratio is 1.79:1 (Table no 1).

Table 1: Distribution of upper giendosc copicbiopsy according to Gender (N=162)

Gender	Number	Percentage %
Males	104	64.19
Females	58	35.8
Total	162	100

Epigastric pain was the commonest presentation in 71 (43.8%) patients. Nausea was the next common presentation seen in 43 (26.5%). Weakness was the least common symptom seen in 10 (6.17%) patients (Table no 2).

Table 2: Chief Complaints of Patients with Upper Gi Lesions (N=162)

Mainbiopsysite	Chief Complaints				
	Nausea	Epigastricpain	Weakness	Looses tools	Loss of weight
Esopahgus	6	8	0	0	11
GEJ	1	1	0	0	2
Stomach	36	54	0	1	9
Duodenum	0	8	10	13	2
Total	43 (26.5) %	71(43.8%)	10 (6.172%)	14(8.6)%	24(14.81%)

In our study, there were 140 (86.41%) non neoplastic lesions and 22 (13.58%) neoplastic lesions. Of the 140 non neoplastic cases, 89 (63.57%) caseswere from males and 51 (36.42%) cases were from females. Of the total 22 neoplastic cases, 15 (68.18%) cases were from Males and 7 (31.81%) cases were from females (Table no 3). Among 22 neoplastic cases, 14 (63.63%) patients had a mixed diet and 8 (36.36%) patients were vegetarians.

Table 3: Distribution of Type of Lesion According Togender (N=162)

Gender (n=162)	Type of Lesion		Total(n)
	Non Neoplastic	Neoplastic	
Males	89(63.57%)	15(68.18%)	104
Females	51(36.42%)	7(31.81%)	58
Total	140(86.41%)	22(13.58%)	162

Esophageal biopsies

Of total 25 esophageal biopsies, 15(60%) were from males and 10 (40%) were from females. 15 (60%) cases were non neoplastic and 10 (40%) cases were neoplastic. 9 (36%) cases showed squamous cell carcinoma, Chronic nonspecific esophagitis was seen in 8 (32%) cases (Table no 4). All esophageal carcinomas were observed in patients above 61 years of age. The most common endoscopic presentation was mucosal erythema seen in 14 (56%) cases that showed features of GERD/ Esophagitis on histological examination. Congestion of mucosa was seen in one case of Barrett's esophagus. All cases of carcinoma showed an ulceroproliferative growth on endoscopy (Table no 4)

9 cases of Squamous cell carcinoma were found in the middle 1/3rd esophagus and 1 case of Aden carcinoma was seen in the lower 1/3rd of esophagus.

Table 4: Histopathological and Endoscopicfindings of Esophagus: (n=25)

Histopathological findings	Endoscopic findings			Total no. of cases
	Mucosal erythema	Congestion of mucosa	Ulceroproliferative growth	
Barrett's Esophagus	0	1	0	1 (4%)
Reflux Esophagitis	6	0	0	6 (24%)
Chronic nonspecific Esophagitis	8	0	0	8 (32%)
Squamous cell carcinoma	0	0	9	9 (4%)
Adenocarcinoma	0	0	1	1 (4%)
Total	14	1	10	25

Gastric biopsies

Of the total 100 gastric cases, 64 (64%) were from males and 36 (36%) from female patients. Among these, 91 (91%) cases were non neoplastic and 9 (9%) cases were neoplastic. Of the total 91 non neoplastic cases, 89 (89%) cases showed chronic gastritis followed by 1 (1%) caseeach of peptic ulcer and hyperplastic polyp. Among the 9 neoplastic lesions, 8 (88.88%) cases of Adenocarcinoma and 1 (11.11%) case was signet ring cell Adenocarcinoma were reported on Histopathological examination (Table no 5). In the present study, gastric carcinomas were observed in 5 (56%) male and 4 (44%) female patients.

Table 5: Histopathological and Endoscopicfinding of Stomach (n=100)

Histopathological findings	Endoscopic findings					Total
	Mucosal erythema/Erosion	Ulceroproliferative growth	Polypoidal mass	Ulcerative growth	Proliferative growth	
Chronic Gastritis	89	0	0	0	0	89
Adenocarcinoma moderately differentiated	0	1	0	1	0	2
Adenocarcinoma well differentiated	0	2	2	1	1	6
Signet ring Adenocarcinoma	0	1	0	0	0	1
Peptic ulcer	1	0	0	0	0	1
Hyperplastic polyp	0	0	1	0	0	1
Total	90	4	3	2	1	100

Out of a total 89 cases of chronic gastritis, 55 (61.7%) cases were chronic nonspecific gastritis followed by 17 (19.1%) cases of Chronic H.Pylori gastritis. Among these, 63 (40.38%) biopsies were from antrum and 60 (38.4%) biopsies were obtained from body of stomach (Table no 6). Mucosal erythema/erosion was the most common endoscopic diagnosis in our study seen in 89 (89%) cases of chronic gastritis. A polypoidal mass was seen in 1(1%) case of hyperplastic polyp. Adenocarcinoma showed ulcerative, ulceroproliferative or a polypoidal growth on endoscopy (Table No 5). 7 (78%) malignant cases were from Antrum and 2 (22%) from pylorus.

Table 6: Incidence and Distribution of Gastritis According to Biopsy Sites (n=89)

Histopathological diagnosis	Biopsy sites				Total no. of biopsies
	Fundus	Body	Antrum	Pylorus	
Chronic Gastritis with H.Pylori positive (9)	1	1	8	8	18
Chronic atrophic gastritis (7)	0	5	7	2	14
Chronic nonspecific gastritis (55)	12	45	33	0	90
Chronic superficial gastritis (17)	2	8	14	8	32
Eosinophilic gastritis (1)	0	1	1	0	2
Total cases : 89	15	60	63	18	156

Duodenal lesions

Of a total 33 duodenal biopsies, 22 (66.66%) were from males and 11 (33.33%) were from females. 31 (93.9%) cases were non neoplastic and 2 (6.06%) were neoplastic. 23 (69.69%) cases of Chronic duodenitis contributed to be the commonest non neoplastic lesion in the study followed by 7 (21.12%) cases of Celiac disease cases and 1 (3.03%) case of Brunner Gland hamartoma. Among the neoplastic lesions, 1 (3.03%) case each of Duodenal adenocarcinoma and Neuroendocrine carcinoma were reported (table no 7). Mucosal erythema or mucosal ulceration was the commonest endoscopic finding seen in 23 (69.6%) cases followed by Scalloping of folds seen in all 7 (21.21%) celiac disease cases. Polypoidal growth was present in a case that was diagnosed as Adenocarcinoma whereas, multiple nodules were seen in neuroendocrine carcinoma endoscopically (Table no 7).

Table 7: Histopathological and Endoscopicfindings of Duodenum(n=33)

Histopathological findings	Endoscopic findings				Total
	Mucosal erythema / ulceration	Scalloped Duodenal fold	Polypoidal growth	Multiple nodules	
Chronic duodenitis	23	0	0	0	23
Celiac disease	0	7	0	0	7
Brunner gland hamartoma	0	0	1	0	1
Adenocarcinoma	0	0	1	0	1
Neuroendocrine carcinoma	0	0	0	1	1
Total	23	7	2	1	33

Among the 4 biopsies taken from GEJ, 3 (75%) cases of Barrett's esophagusand 1 (25%) case of Adenocarcinoma were seen. Most common endoscopic finding of congestive mucosa was noted in all 3 (75%) cases of Barrett's Esophagus and ulceroproliferative growth was seen in 1 (25%) case of Adenocarcinoma.

DISCUSSION

Several lesions can affect the upper gastrointestinal tract including congenital anomalies, infections, inflammation, polyps, benign and malignant neoplasms. Before the emergence of endoscope, direct access to the lesions of gastrointestinal tract was difficult which resulted in inadequate diagnosis and management. As stated by National cancer registry the incidence of gastric and esophageal carcinomas are gradually increasing and have poor prognosis in late stages according to Globocan.[5,6] Endoscopy directly visualizes the lesions and more biopsies can be obtained from suspected areas to detect the lesions earlier for the diagnosis and definitive management.[7,8]

The present study comprising of 250 biopsies from 162 patients had 75% (188) biopsies from stomach, 13% (33) from duodenum, 10% (25) from esophagus and 2% (4) from Gastroesophageal junction (Chart no 1). In our study, maximum numbers of biopsies were from stomach, followed by duodenum, Esophagus and Gastroesophageal junction. The present study is comparable to a study conducted by Sharma A et al where out of a total 200 upper GI endoscopic biopsies, 130 (65%) biopsies were from stomach, 44 (22%) from duodenum and 26 (13%) biopsies were from esophagus.[9] Our findings were also similar to a study done by Margaret TJ et al wherein out of 152 Upper GI biopsies 113 (74%) biopsies from stomach, 22 (15%) from esophagus and 17 (11%) from Duodenum.[10] This result can also be compared to a study carried out by Mohan B wherein out of a total 106 biopsies, 60% were from stomach, 22% from esophagus ans 17% from duodenum.[11]

The present study showed 41 (25.3%) patients of upper GI endoscopic biopsies in a age group 31-40 years followed by 30 (18.51%) patients in the age group 41-50 years. The lowest incidence was observed in age groups >71 years and<21 years which had 8 (4.93%) and 9 (5.5%) patients respectively (Chart no 2). In the present study, maximum patients were seen in 3rd to 5th decade. Our result was similar to a study conducted by Margaret TJ et al, wherein the commonest age group for upper GI endoscopic biopsy was 31-40 years.[10] Our result was also comparable to a study done by Hirachand et al wherein the maximum patients were in the age group 41-50 years. Differences in the age group dominance can be explained due to geographical, cultural and ethnical diversity.[12]

Out of 162 patients, 104 (64.19%) were males and 58 (35.8%) were females with a male female ratio of1.79:1 (Table no 1). Our findings are similar to other studies carried out by Hirachand et al where the male female ratio was 1.76:1[12] Our result was almost similar to another study done by Sheikh et al wherein the ratio observed was 1.92:1.[13] Similarly JC Paymaster et al had a ratio of 2.8:1.[14] The female genderis less preponderant and could

be observed because of social obligations as compared to males who have ahigherexposure to risk factors.

In our study of 162 patients, Epigastric pain was the commonest chief complaint seen 71 (43.8%) patients followed by nausea seen in 43 (26.5%) patients and weakness seen in 10 (6.17%) patients (Table no 2). Similar results were seen in a study done by Patel KS et al that had 53(53%) patients with epigastric pain and 18(18%) patients with nausea as their chief presenting complaint.[15] Our findings were almost similar to a study done by Ainapure et al where out of a total 322 patients, 160 (49.68%) patients presented with epigastricpain.[16]

Our study had 140 (86.41%) non neoplastic lesions and 22 (13.58%) neoplastic lesions (Table no 1). More number of non-neoplastic lesions were present in our study. Our finding was almost similar to the study done by Margaret TJ et al where the non-neoplasticlesions were137 (90.13%) and neoplasticlesions were 15 (9.87%).[10] another study done by Rani et al reported 54% of non-neoplastic and 40% neoplastic lesions.[17] In contrast to our study, Mohan B et al reported more number of neoplastic than non-neoplastic lesions.[11] These differences in the result may be due to genetic, environmental, personal and nutritional factors in an individual.

Histopathological Spectrum of Esophageallesions: Out of total 25 cases, 15 (60%) cases were non-neoplastic and 10 (40%) were neoplastic lesions. (Table no 2) Chronic nonspecific Esophagitisseen in 8 (32%) patients was the commonestnon - neoplasticlesion which was similar to another study done by Kothari et al where there were 12 (24%) cases of chronic nonspecific esophagitis.[18] Out of the 10 neoplastic lesions in our study, all 9 (36%) cases of squamous cell carcinoma were present in the middle one third esophagus and was the commonest malignancy. 1 (4%) case of Adenocarcinoma was present in the lower 1/3rd of esophagus. This finding was consistent withotherstudiesd one by Ganga et al and Mohan B et al wherein middle 1/3rd was the commonest site for esophageal malignancy.[11,19] All cases of esophageal malignancies were found to be in theolder age group (>61 years). A study conducted by Malkan G et al reported ahigherincidence of esophageal carcinomain the6th decadein India.[20] Maximum number of esophagealcarcinoma patients had a mixed diet. A similar finding was reported in another study done by Samasaram I et al where squamous cellcarcinoma was seen in patients whose diet is low in fruits and vegetables.[21] The most common endoscopic presentation was mucosal erythema seen in 14 (56%) cases followed by 10 (40%) cases showing ulceroproliferative growth. (Table no 4) In the present study, all 10 (100%) carcinoma cases presented as growth on endoscopy. Our finding was comparable with another study done by Rani D et al wherein, out of a total 30 cases, 25(83.3%) cases of carcinoma presented with growth on endoscopy.[17] Our result is also comparable to a study done by Karre S et al wherein 39% cases had mucosal erythema and 61.1% cases had growth on endoscopy.[22]

Histopathological spectrum of Gastriclesions: In this study, of a total 100 cases, 90 (90%) are non-neoplastic cases and 10 (10%) are neoplastic. This result was comparable with the other studies done by Margaret TJ et al wherein out of a total 113 gastric cases, 104 (92%) were non-neoplastic 9 (8%) cases were neoplastic.[10] Our finding was also comparableto a study conducted by Karre S et al where 71.4% were non-neoplastic lesions and 28.6% were neoplastic[22] Chronic gastritis was the commonest lesion accounting for 89 (89%) cases (Table no 5). Most of the patients with chronic gastritis belonged to age group 31-40 followed by 41-50 years and were mostly male patients. Chronic smoking and alcoholusecauseslow pyloric pressure in the adult population it may lead to bile reflux and damage the gastric mucosal barrier.[15] Our study reported 9 (10.11%) cases of Chronic H Pylori gastritis which was almost comparable to a study done by Kothari et al who reported 6(12%) chronic H. Pylori gastritis cases.[18] Our finding was also comparable to a study conducted by Rashmi et al who reported 3 (7%) cases of Chronic H. Pylori Gastritis.[4] The low incidence of H. Pylori gastritis could be due to availability of new ergeneration of

antibiotics and improved non invasive tests for detection of H. Pylori. Out of a total 9 gastric carcinoma cases, 7 (78%) cases were from Antrum whereas 2 (22%) cases were from pylorus. This was similar to studies conducted by Rashmi et al who reported 8 (43%) cases in pylorus.[4] The antrum is the commonest site of gastric carcinoma as most atrophic gastritis occurs in this region. Over the years, there is development of a condition known as achlorhydria which could lead to reduction and nitrates and formation of carcinogenic N-Nitro so compounds which could be one the factors causing gastric carcinoma.[23] In our study, 90 (90%) cases had mucosal erythema as their endoscopy finding which included 89 (89%) cases of gastrit is and 1 (1%) case of pepticulcer. This was inconsensus withot her studiesd one by Memon et al where 80.6% gastric cases showedmucosalery the maduringen do scopicexamination.[2]

Histopathological spectrum of Duodenallesions: In duodenum, 31 (93.93%) cases were non neoplastic whereas 2 (6.06%) cases were neoplastic cases (Table no 7). A study conducted by Suvarna S et al had 20 (80%) non neoplastic cases and 5 (20%) neoplastic cases.[24] Our result is also similar to a study done by Mohan B et al wherein 89% were non-neoplastic and 11% were neoplastic lesions.[11] There was 1 (3.03%) case of Adenocarcinoma in the current study, which was almost similar to a study by Ganga et al where there were 2 (5.88%) cases of Adenocarcinoma.[19] The incidence of duodenal malignancy is higher in older age groupbecause of late diagnosis of the condition due to nonspecific symptoms and symptoms resembling closely to that of aduodenal ulcer.[25] 1 (3.03%) Neuro endocrine tumor was reported in our study and was similar to another study conducted by Kothari et al who also reported a 1(1%) case of neuro endo crinecarcinoma.[18] All 7(100%) cases of celiac disease had scalloping of mucosa on endoscopic examination (Table no 7) which was similar to another study done by Rani et al wherein 12 (85.7%) cases of celiac disease had Scalloping present.[17] Endoscopically, multiple nodules were seen in neuroendocrine carcinoma (Table no 7) which was similarly observed in another study carried out by Karre S et al.[22]

CONCLUSION

In the present study, there were 4(2%) cases from GEJ (Chart no 1). This finding was similartoa study done by Gangaetal who had a total of 5(3%) GEJ cases.[19]

Regarding concordance with endoscopic diagnoses, in our study 95.67% of histologically confirmed cases were clinically/ endoscopically diagnosed or suspected by the clinician.

Conflict of Interest: No potential conflicts of interest to disclose.

In our present study we observed morenonneo plastic than neoplastic cases with higher incidence of non-neoplastic lesions inpatients less than 50 years of age. Stomach was the commonest site of endoscopic biopsies. Chronic gastritis was the most common non neoplastic lesion of stomach which presented as mucosal erythema on endoscopy. Squamous cell carcinoma was the commonest esophageal lesion having ulceroproliferative growth on endoscopy. In contrast to this, neoplastic lesions were seen in the olderage group.

Hence we conclude that the upper GI endoscopyhelps in early detection of several mucosal lesions, diagnosis of malignancies at early stages and of clinically suspected lesions leading to prompt treatment.

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ORIGINAL ARTICLE

Menarche in Transkei Region South Africa

B Meel

ABSTRACT

Introduction:

Background: The age of menarche is an important milestone in a life of a woman. It is a sign of maturity of a girl to undergo sexual life. Some studies have shown that there is significant decline in the mean age of menarche in developed countries. Menarche is primarily important because of its timing within puberty and its sensitivity to environmental changes. Mean age of Menarche is an indicator of population health, well-being, and socio-economic status, and declines under improved environmental conditions.

Objective: To study the age at menarche in the Mthatha area of South Africa.

Method: This is a descriptive study from the records of Sinawe center between 1st January and 31st December 2008. The Sinawe Center is the only center who deals with all the cases of sexual assaults in the area. The retrospective method is applied to recall their age at menarche at the time of examination of victim of sexual assault from all the rape survivals who has presented to Sinawe Center.

Result: There were 636 subjects of rape recorded in Sinawe Center. Of this, the age of menarche was found recorded in 464 cases. The youngest age group (11-15 years) were 86 (18.5%) of subjects in this study. Of this, among 8 (1.7%) were having age at menarche under 12 years of age, 50 (10.7%) were between 12 and 13 years, 28(6%) were 14 and 15 years of age group. The mean age of menarche is 13.94 years. The maximum age at menarche was 15.64 years amongst 46 to 50 years old women, and the minimum was 12.56 years amongst 11- and 15-years old girls (p=<0.05, 2 =216). There were 32 (6.9%) women who were above the age group of 50 years. Among them, the age at menarche was ranged from 14.67 to 14.85.

Conclusion: There is a decreasing trend in the age of menarche in the Transkei region of South Africa. It is a matter of concern.

KEYWORDS |Menarche; Women health; Puberty.

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INTRODUCTION

Menarche, the first menstrual period in females, signals the beginning of the capacity to reproduce and is associated with secondary sexual characteristics. Menarche is a significant milestone in a women's life.[1] Adverse effects of an earlier age at menarche include risk of premature death, endometrial cancer, and breast cancers.[2] Early menarche is associated with increased risk of depression, cardiovascular disease and metabolic syndrome, insulin resistance, polycystic ovarian syndrome, and teenage pregnancy.[3] Studies from high-income countries suggested that early onset of menarche may be linked to early sexual initiation, the uptake of alcohol and other substances, and early dropouts from school.[4,5] Early age of menarche is also associated with familial conflict, alteration in family structure, and stressful home circumstances.[6,7]

The mean age of menarche is considered an indicator of population health, well-being, and socio-economic status and declines under improved environmental conditions.[8] Mean age at menarche varies between women across different countries and ethnic groups.[9] There is a decline in the age of menarche in developed countries. The mean age of menarche was 14 years in the early 1900s and declined to 12.8 years by the 1940s.[10] Various studies on the age of menarche in South Africa demonstrated a decline in the mean age of menarche among urban girls.[11,12] Association between childhood sexual abuse and early age of menarche was established by a few studies.[13,14] The risk of early menarche increased with increasing frequency of sexual abuse incidents was also found.[17] Mean age of menarche was studied in the literature for both developed and developing countries, but it was not studied among victims of rape. The study aimed to assess the mean age at menarche and its trend among victims of rape in the Mthatha area of South Africa.

METHODS

This study is a descriptive study from the records of Sinawe center in 2008. The Sinawe Center is the only center that deals with all the cases of sexual assaults in the area. The retrospective method is applied to recall their age at menarche of the victim of sexual assault from all the rape survivors who have examined the victim of sexual assault from all the rape survivors who have presented to Sinawe Center.

Sinawe Centre is the only unit in this area, which deals with cases of sexual assaults. It renders services to about 400000 population. It has staff of 15, which includes medical consultants, professional nurses, social workers, and police officers on duty. The victims were from different age groups and eight districts around Mthatha, such as Mquanduli, Elliodale, Ugie, Ngcobo, Tsolo, Qumbu, Maclear areas. Therefore, it can be fairly presumed that this is a generalizable 'sample' representing the general population. The data were analyzed with the help of the SPSS program and presented in the form of tables and figure.

RESULTS

There were 636 victims of rape examined in the center. Of this, the age of menarche was found recorded in 464 cases. The youngest age group (11-15 years) were 86 (18.5%) of subjects in this study. Of this, among 8 (1.7%) were having age at menarche under 12 years of age, 50 (10.7%) were between 12 and 13 years, 28 (6%) were 14 and 15 years of age group. The elderly (>60 years) rape victims who presented to Sinawe center were 18 (3.9%).

The highest number 180 (38.8%) of victims of rape who were presented to Sinawe center between the age group of 16 and 20 years of age followed by 11 to 15 years of age (18.5%). The age at menarche was reported <12-year by 15 (3.2%), 12 to 13 years by 113 (24.3%), 14 to 15 by 243 (52.3%) 16 to 17 by 76 (16.4%) 18 to 19 by 14 (3.0%) and 20 years and above by 3 (0.6%) of rape victims. (Table 1)

There were only two (0.4%) women (above 36 years of age) who had menarche at the age of 12 and 13 years. There were women (0.6%) between the age of 41 and 50 years who were started menstruating (menarche) at the age

of above 20 years and above. There was no significant difference in age of menarche between each consecutive age group and the youngest age group. There was a slight increase in mean age at menarche as age got older (Fig. 1).

The mean age of menarche was 13.94 years. The age of menarche, was 15.64 years amongst 46 to 50 years old women, and it was 12.56 years amongst 11 to 15 years old girls (Table 2). The thresholds for the age of menarche were continuously 3.08 years decrease from last three decades. Last 35 years, the age of menarche among rape victims has decreased by 3.08 years. It indicated that thresholds for the age of menarche decrease one year in a decade. P-value= 0.000 and chi-square value 2=216.67 Pearson correlation coefficient = 0.349 and two-tailed significant (2-tailed) = 0.000. There were 32 (6.9%) women who were above the age group of 50 years. Among them, the age at menarche was ranged from 14.67 to 14.85

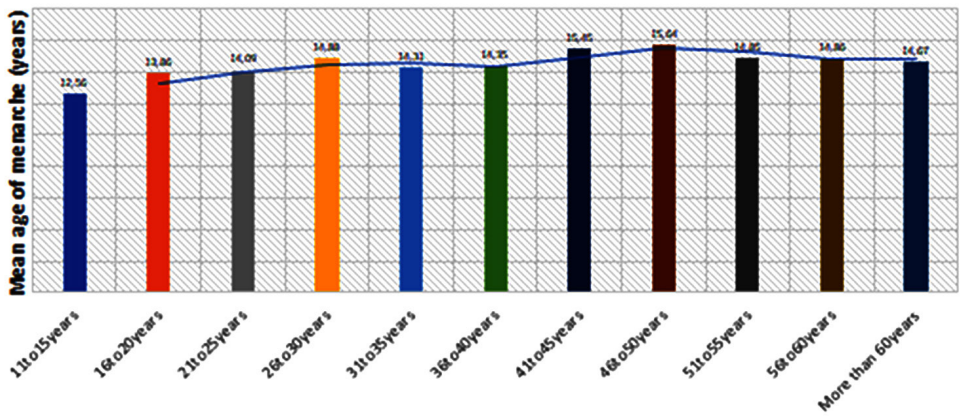
Table 1: Age of menarche in different age groups in Mithatha area of South Africa in 2008.

Age (Yrs.) Group	<12(%)	12-13 (%)	14-15 (%)	16-17 (%)	18-19 (%)	>20 (%)	Total (%)
11-15	8 (53.3)	50 (44.2)	28 (11.5)	0 (0.0)	0 (0.0)	0 (0.0)	86 (18.5)
16-20	4 (26.7)	36 (31.9)	112 (46.1)	27 (35.5)	1 (7.1)	0. (0.0)	180 (38.8)
21-25	1 (6.7)	20 (17.7)	37 (15.2)	15 (19.7)	5 (35.7)	0 (0.0)	78.(16.8)
16-30	1 (6.7)	4 (3.5)	12 (4.9)	12 (15.8)	4 (28.6)	0 (0.0)	33 (7.1)
31-35	1 (6.7)	1 (0.9)	10 (4.1)	3 (3.9)	1 (7.1)	0 (0.0)	16 (3.4)
36-40	0 (0.0)	1 (0.9)	12 (4.9)	4 (5.3)	0 (0.0)	0 (0.0)	17 (3.7)
41-45	0 (0.0)	0 (0.0)	8 (3.3)	0 (0.0)	1 (7.1)	2 (66.7)	11 (2.4)
46-50	0 (0.0)	0 (0.0)	5 (2.1)	4 (5.3)	1 (7.1)	1 (33.3)	11 (2.4_
51-55	0 (0.0)	1 (0.9)	3 (1.2)	2 (2.6)	1 (7.1)	0 (0.0)	7 (1.5)
56-60	0 (0.0)	0 (0.0)	4 (1.6)	3 (3.9)	0 (0.0)	0 (0.0)	7 (1.5)
> 60	0 (0.0)	0 (0.0)	12 (4.9)	6 (7.9)	0 (0.0)	0 (0.0)	18 (3.9)
Total	15 (100)	113 (100)	243 (100)	76 (100)	14 (100)	3 (100)	464 (100)

Table 2 : The mean age at menarche in different age groups in Mathatha area of South Africa in 2008

Age-groups (yrs.)	Age at Menarche	Number of Subjects (%)	Standard Deviation	Std. Error of Mean	95% Confidence Interval for Mean	
					Lower	Upper
11 to 15	12.56	86 (18.5)	.60730	.06549	2.1024	2.3628
16 to 20	13.86	180 (38.79)	.67580	.05037	2.8178	3.0161
21 to 25	14.09	78 (16.81)	.87449	.09902	2.8413	3.2356
26 to 30	14.88	33 (7.11)	.96922	.16872	3.0806	3.7679
31 to 35	14.31	16 (3.45)	.88506	.22127	2.6534	3.5966
36 to 40	14.35	17 (3.77)	.52859	.12820	2.9047	3.4482
41 to 45	15.45	11 (2.37)	1.27208	.38355	2.8727	4.5819
46 to 50	15.64	11 (2.37)	.98165	.29598	3.1587	4.4777
51 to 55	14.85	7 (1.50)	.97590	.36886	2.5260	4.3311
56 to 60	14.86	7 (1.50)	.53452	.20203	2.9342	3.9229
> 60 Years	14.67	18 (3.88)	.48507	.11433	3.0921	3.5746
Total	13.94	464 (100)	.84432	.03920	-	-

Fig. 1: Trend in the mean age at menarche in different age groups in Mthatha area of South Africa in 2008.



In the present study, the mean age at menarche was 13.94 years (Table 2 & Fig. 1). Padez (2003) carried out a similar study among 753 urban Mozambican schoolgirls and found mean age at menarche was 13.35 years.[27] This indicates that Mozambican schoolgirls have a lower age (fewer 0.59 years) at menarche than Xhosa girls in the Mthatha area. This could be a hereditary factor that can influence the age at menarche.

Although menarche is a significant event in a women's life and their experiences also vary at a personal level, with cultural, religious, and societal environmental settings;[28] national-level data on the average age of menarche is not collected routinely and it represents a missed opportunity. National-level data on the average age of menarche could provide critical information for various sectors like nutritionists, sexual and reproductive health experts, and experts working on the gender gap in education.[29] Knowledge of the average age of menarche can help understand the pubertal trends among girls with more accuracy as it is perceived as the least subjective indicator. Other than this average age of menarche would allow for public health trend analysis, clinical applications, and socio-economic inequalities among various populations in a country.[29]

A study in urban South Africa (2009) has shown that the age at initiation has remained stable. Still, a statistically significant positive secular trend in the age-period at menarche (Average decline of 0.5 years per decade) was seen for urban South African girls.[30] This findings show that rape victims could have different factors that could have led them to start menstruation earlier than the other South African girls.

LIMITATION

The recall biases of the subjects could not be rules it out. However every precaution was taken during their interview to minimize it.

CONCLUSION

There is a decreasing trend of one year in each decade in the age of menarche in the Mthatha area of South Africa. This decreasing trend is a matter of concern. There is a need for further research studies to find out the factors associated with early menarche among victims of rape in the Mthatha area of South Africa.

ETHICAL ISSUE

The author has ethical permission for a case report publication (approved project No. 4114/1999) from the Ethical Committee of the University of Transkei, South Africa.

Conflict of Interest:
The author has made no acknowledgment in this article.
Source of Funding:
The author declares that this is a self-funded research project.

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Erratum

Erratum

The article "Effect of Thermochromic Ink on Different Types of the Papers" was published with the improper names of the authors.

Journal Title: Indian Journal of Forensic Medicine and Pathology. Volume 14, Number 2, April - June 2021 (Special Issue). DOI:http://dx.doi.org/10.21088/ijfmp.0974.3383.14221.56. The page number: 403.

The names of all authors, exactly as they appear in the published article: Anamika Das[1], Suneet Kumar[2], Ahmed Sayeed[3]

The names of all authors, are exactly corrected and should be read as 'Das Anamika*, Suneet Kumar**, Sayeed Ahmed***'

All versions of this article have been corrected.

Mistake is regretted
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Reference from electronic media

- National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.
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