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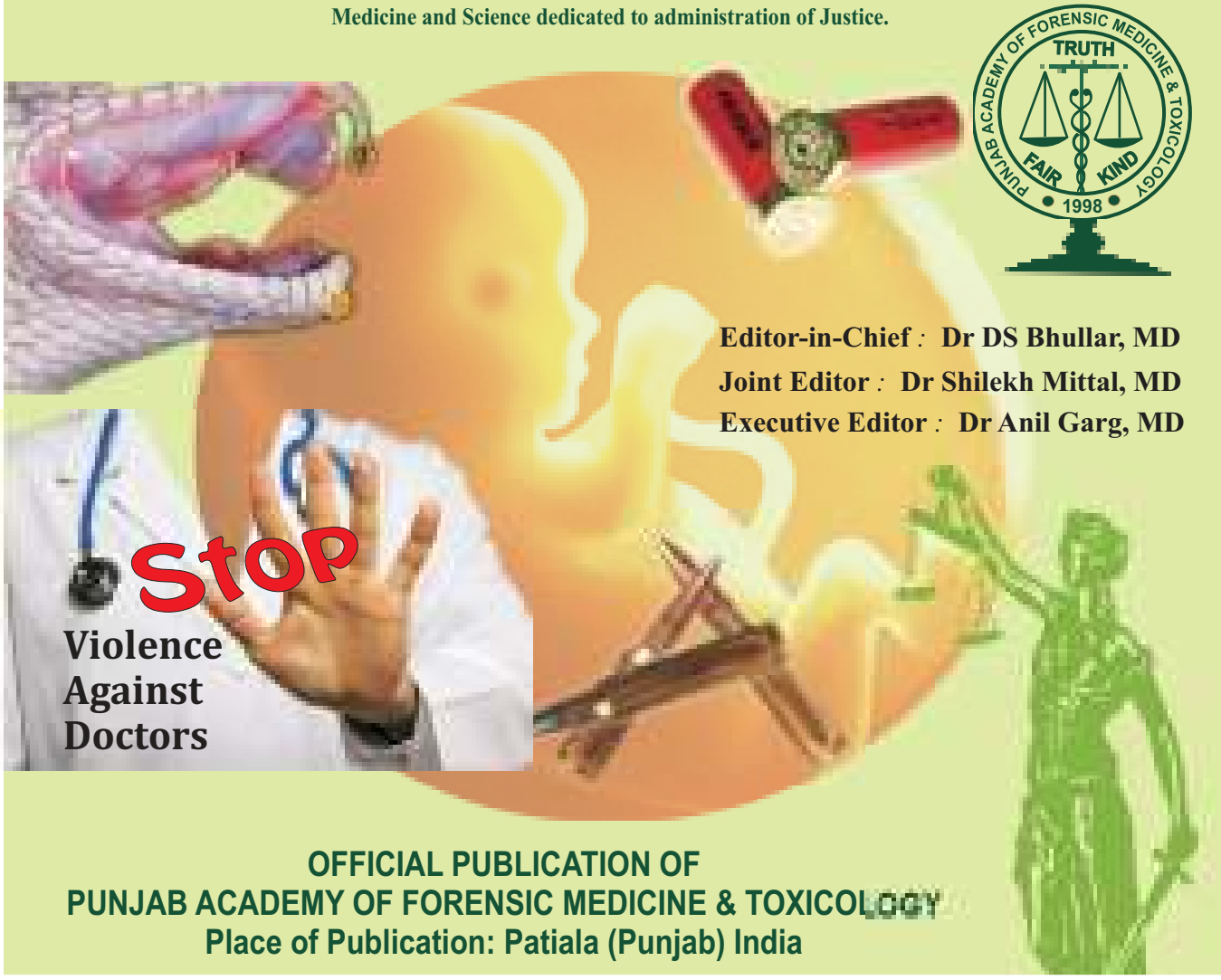

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AIMS AND SCOPE

This journal is being published as an official publication of the journal of Punjab Academy of Forensic Medicine and Toxicology. This journal is meant for achieving the aims and goals of the academy to expand the academic activities and spread the knowledge and latest research in the field of Forensic Medicine and Toxicology. Journal publishes original research papers, review articles, case reports and review of books on Forensic Medicine and Toxicology. Journal highlights the achievements of the academy and its members.

This journal covers the various aspects of Forensic Medicine and Toxicology. It covers the Forensic Pathology, Clinical Forensic Medicine, Identification, State Medicine, Medical Jurisprudence, Legal Medicine, Forensic Nursing Science, Forensic Odontology, Forensic Osteology, Forensic Serology and Forensic Psychiatry. It also covers the various aspects of Toxicology including Analytical Toxicology and Environmental Pollution.

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From the Desk of Editor-in-Chief

I am pleased to present the first issue of the year 2017 of this esteemed journal of Punjab Academy of Forensic Medicine & Toxicology. I am thankful to the authors and contributors for the scientific articles and research papers which are being published in this issue. I am also thankful to the editorial team for supporting me in its publication and the members of the Academy for giving me the opportunity to continuously serve as Editor-in-Chief of the journal.

My special thanks to Joint Editor Dr Shilekh Mittal and Executive Editor-cum-webmaster Dr Anil Garg for their support and sincere efforts for timely publication and release of this issue.

The journal has entered in the 17th year of its publication and it is now covered by **Elsevier products (Scopus), Med-Ind and DOAJ** and many other citing bodies namely **Safetylit, Worldcat library & WHO HINARI.**

Any suggestions and advice for further improving the standards and quality of the journal will be highly appreciated.

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Editorial

Med Asylum & False Medical Certificates

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Abstract:- The Medical Council of India has provided a list of certificates, reports, notifications etc. issued by doctors for the purposes of various acts / administrative requirements and the doctors are supposed to act as per law while preparing these certificates. Sometimes the medical professionals are alleged to issue false certificates for various reasons and considerations which is not only disgrace to the profession but also punishable under law of the land. The moral, ethical and legal implications of such falsified medical reports are being discussed here.

Key Words:- Med-asylum, Contempt of Court, Medical Certificate, Unethical, Code of Ethics, Lunacy, Professional Conduct, Forgery, Indian Penal Code.

Introduction

The Supreme Court of India has convicted two senior doctors of a private hospital in Gurgaon in Haryana for contempt of court for providing "medical asylum" to a former Haryana MLA who was allowed to be admitted in the hospital for 527 days without any ailment in order to frustrate the court's order to send him behind bars in a murder case [1]. A bench of Chief Justice TS Thakur and Justices R Banumati and UU Lalit held that the doctors – Dr Munish Prabhakar and Dr KS Sachdev - and a former MLA Balbir had tried to obstruct the administration of justice as there was no medical reason to justify his admission in the hospital for such a prolonged period. It directed them to be personally present in the court when it will decide the quantum of punishment for contempt of court.

Doctors are required to issue medical certificates and / or certificate of fitness to work or resume duty [2] and at times they are urged by friends, or other individuals to provide certificates with falsified information to take medical leave, claim financial benefits, compensation etc. and, they may find it difficult to say no. But, what are the legal and medico-legal implications of such undue, unethical, illegal and immoral acts of favours by the doctors to their alleged patients needs to be discussed and highlighted by the right thinking medical experts and leaders of the professional bodies.

Medical Certificates, Reports, Notifications under MCI Code of Ethics Regulations

The Medical Council of India has provided a list of certificates, reports, notifications etc. issued by doctors for the purposes of various acts / administrative requirements in Appendix 4 of its Code of Ethics Regulations 2002[3]:

- Under the Acts relating to birth, death or disposal of the dead.
- Under the Acts relating to Lunacy and Mental Deficiency and under the Mental Illness Act and the rules made thereunder.
- Under the Vaccination Acts and the regulations made thereunder.
- Under the Factory Acts and the regulations made thereunder.
- Under the education Acts.
- Under the Public Health Acts and the orders made thereunder.
- Under the Workmen's Compensation Act and Persons with Disability Act.
- Under the acts and orders relating to the notification of infectious diseases.
- Under the Employee's State Insurance Act.
- In connection with sick benefit insurance and friendly societies.
- Under the Merchant Shipping Act.
- For procuring / issuing of passports.
- For excusing attendance in courts of justice, in public services, in public offices or in ordinary employment.
- In connection with Civil and Military matters.
- In connection with matters under the control of Department of Pensions.
- In connection with quarantine rules.
- For procuring driving certificates.

Medical certificates are legal documents. Doctors therefore must be aware of the implications of signing a medical certificate, to themselves, the patient and the organization to which the certificate would be submitted and act accordingly to the regulations defined by the MCI relating to the Professional Conduct, etiquette and Ethics. Any certificate issued by a doctor not as per the requirement defined in the Regulation 1.3.3 of the MCI Code of Ethics Regulations 2002 (as follows) is not a valid certificate:

"A Registered Medical Practioner shall maintain a Register of Medical Certificates giving full details of the certificates issued. When issuing a medical certificate he / she shall always enter the identification marks of the patient and keep a copy of the certificate. He / she shall not omit to record the signature and / or thumb mark, address and at least one identification mark of the patient on the medical certificates or report."

In Ram Narain Gupta vs Smt. Rameshwari Gupta on 12 September 1988 AIR 2260, 1988 SCR Supl. (2) 913, the Supreme Court of India observed: "…….neither in the first certificate (Ext.4) nor in the second certificate (Ext. 3) ……..stated that the schizophrenia, the defendant is suffering from, was of the third variety, namely, Catatonia, when the patient becomes wild, destructive and violent. In this statement also……..does not state that the schizophrenia was of Catatonia variety. He does not say even a word about the danger, arising from the mental disorder of the defendant. The certificate Ext. 3 does not bear the thumb impression or the signature of the defendant and, therefore, it cannot be said with certainty that the said certificate was issued by……..after having examined the defendant."

If the doctor issues a false certificate, he/she can lose license (permanently) to practice as per Regulation 7.7, which says "Any registered practitioner who is shown to have signed or given under his name and authority any such certificate, notification, report or document of a similar character which is untrue, misleading or improper, is liable to have his name deleted from the Register. "

Issuing a false certificate is forgery, which is an offence liable to imprisonment under Section 468 of the Indian Penal Code and has been defined under Section 463 of the IPC [4]:

- Section 468 IPC: Forgery for purpose of cheating: Whoever commits forgery, intending that the document or the electronic record forged shall be used for the purpose of cheating, shall be punished with imprisonment of either description for a term which may extend to seven years, and shall also be liable to fine."
- Section 473 IPC: Whoever makes any false documents or false electronic record or part of a document or electronic record, with

intent to cause damage or injury, to the public or any person, or to support any claim or title, or to cause any person to part with property, or to enter into any express or implied contract, or with intent to commit fraud or that fraud may committed, commits forgery."

The Delhi Medical Council has framed guidelines for issuance of medical certificate in its order [5] DMC/DC /F.14/Comp. 1107/2/2014 dated 17th October, 2014:

a. "Medical certificates are legal documents. Medical practitioners who deliberately issue a false, misleading or inaccurate certificate could face disciplinary action under the Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002.

   Medical practitioners may also expose themselves to civil or criminal legal action. Medical practitioners can assist their patients by displaying a notice to this effect in their waiting rooms. It is, therefore a misnomer to state that medical certificate in "not valid for legal or court purpose," and should be avoided. Registered medical practitioners are legally responsible for their statements and signing a false certificate may result in a registered medical practitioner facing a charge of negligence or fraud.

b. The certificate should be legible, written on the doctor's letterhead and should not contain abbreviations or medical jargon. The certificate should be based on facts known to the doctor. The certificate may include information provided by the patient but any medical statements must be based upon the doctor's own observations or must indicate the factual basis of those statements. The certificate should only be issued in respect of an illness or injury observed by the doctor or reported by the patient and deemed to be true by the doctor.

   The certificate should:

i. Indicate the date on which the examination took place.

ii. Indicate the degree of incapacity of the patient as appropriate.

iii. Indicate the date on which the doctor considers the patient is likely to be able to return to work.

iv. Be addressed to the party requiring the certificate as evidence of illness e.g. employer, insurer, magistrate.

v. Indicate the date the Certificate was written and signed.

vi. Name, signature, qualifications and registered number of the consulting Registered Medical Practitioner.

vii. The nature and probable duration of the illness should also be specified. This certificate must be accompanied by a brief resume of the case giving the nature of the illness, its symptoms, the causes and duration. When issuing a sickness certificate, doctors should consider whether or not an injured or partially incapacitated patient could return to work with altered duties.

c. The medical certificate under normal circumstances, as a rule, should be prospective in nature i.e. it may specify the anticipated period of absence from duty necessitated because of the ailment of the patient. However, there may be medical conditions which enable the medical practitioner to certify that a period of illness occurred prior to the date of examination. Medical practitioners need to give careful consideration to the circumstances before issuing a certificate certifying a period of illness prior to the date of examination, particularly in relation to patients with a minor short illness which is not demonstrable on the day of examination and should add supplementary remarks, where appropriate, to explain the circumstances which warranted the issuance of certificate retrospective in nature.

d. It is further observed that under no circumstances, a medical certificate should certify period of absence from duty, for a duration of more than 15 days. In case

the medical condition of the patient is of such a nature that it may require further absence from duty, then in such case a fresh medical certificate may be issued.

e. Record of issuing medical certificate Documentation should include:

- Patient to put signature / thumb impression on the medical certificate.
- Identification marks to be mentioned on the medical certificate.
- That, a medical certificate has been issued.
- The date / time range covered by the medical certificate.
- The level of incapacity (i.e. unfit for work, light duties etc. within scope of practice)

An official serially numbered certificate should be utilized. The original medical certificate is given to the patient to provide the documentary evidence for the employer. The duplicate copy will remain in the Medical Certificate book for records. The records of medical certificate are to be retained with the doctor for a period of 3 years from the date of issue."

Under the Medical Council (Professional conduct, Etiquette and Ethics) Regulations, 2002, Chapter 7.5, conviction by a Court of Law for offences involving moral turpitude / Criminal act, amounts to professional misconduct.[6] Such incidents spoil the image of the medical profession. Giving false certificates, medical asylum, filling false mediclaim forms all spoil the image of the profession. Professional misconduct (syn. Infamous conduct, ethical misconduct, ethical negligence, ethical malpraxis) is that act of a medical man which would be reasonably regarded as disgraceful or dishonorable by his professional brethren of good repute and competence.[7] Strictly speaking, professional misconduct should include only those actions for which there are no punishments in Indian Penal Code or in any other existing civil or criminal law, yet the Medical Council of India or State Medical Council can take action by removing the name of the doctor. However, the list of professional misconducts issued by The Indian Medical Council (Professional Conduct, Etiquette and Ethics) Regulations, 2002 includes many acts for which there are punishments both in Indian Penal Code [criminal misconduct] and Medical Council of India [civil misconduct] and it is important to remember that a list of this nature can never be complete and exhaustive. Depending on the circumstances, even acts not mentioned in this list may be taken as examples of infamous conduct.

Conclusion:

Under the medical laws of India, issuing of medical certificate is the legal duty of the medical professionals but issuing false medical certificates for the purpose of unlawful favours to the patients or the people who are not the real patients but made so by the doctor with false or fabricated medical certificate is illegal and punishable under law which may even include disallowing the accused doctor to practice further called "professional death sentence" and ruin the future of the people directly or indirectly involved in such illegal activities. Such medical professionals are disgrace to the medical profession and need deterrent punishments and be disowned by the medical brethren of good repute.

Conflict of interest

None declared

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Original Research Article

Forensic Age Estimation on Digital Panoramic Radiographics by Application of KVAALS Technique

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Abstract

Age is one of the essential factors in establishing the identity of a person. The objective of this study was to assess the age of subjects using Kvaal's method from digital orthopantomographs and compare this estimated age with the actual age of the subjects. Age was calculated for 100 subjects between 20 to 60 years using Kvaal's method on digital orthopantomographs and the mean estimated age was compared with the actual age. After a thorough statistical analysis, the results were obtained, which showed that there was no significant difference between estimated age and actual age of the subjects. The results suggsted the feasibility of Kvaal's method for age estimation in the set sample. Also it gives a scope for future studies on larger sample size with adequate representation of samples from different age groups and sex distribution.

Key Words:- Orthopantomographs, Age, Kvaal's method, Identification.

Introduction

Age plays important role in identification of unknown dead bodies [1] . At the age of 21 years a male can go for a marriage. As per section 366 B IPC if a girl below 21 years of age imported to India from a foreign country for the purpose of illicit intercourse the act amounts to kidnapping. Person under the guardian ship of the court of wards attain majority at the age of 21 years. At the 25 years of age a person can contest membership of parliament and other legislative bodies. In some government services a person above the 25 years can not join the government service. According to Punjab excise act a person below 25 years of age can not buy and consume liquor. The minimum age for appointment of President, Vice President and Governor of States in India is 35 years of age. 55 years age to 65 years age is the age of retirement from services under the government statutory bodies, autonomous bodies and institutes or from judicial services [2]

Kvaal and Solheim given a method used on adults for calculation of age with the help of morphological and radiological methods, but extraction was still required. Hence to improve this procedure Kvaal et al made a method which is totally based on radiological analysis [3].

A Panoramic radiograph or OPG is an extra oral diagnostic single image which shows the upper and lower dental arches, teeth, temporomandibular joints and its surrounding structures [4,5,6]. The aim of an ideal age estimation technique was to arrive at an age as close to the chronological age as possible. Gustafson, provided the first scientific method of age estimation based on morphological and histological changes of the teeth, which employed

six individual age related changes but did not include difference in color or fluorescence from any tooth structure [7]

Johanson modified Gustafson technique by using more detailed scale and by multiple regression analysis. But both these techniques employ destruction of the tooth specimen [8]

Material and Methods

The research was done on 100 cases (57 males and 43 females) in the age group of 20 to 60 years were selected by random sampling and confirming the age by birth certificate or matriculation certificate whosoever came for OPG. Subjects should have all the required complement of teeth on either right or left side. Maxillary Central incisor, Maxillary Lateral incisor, Maxillary Second bicuspid Mandibular Lateral incisor, Mandibular Canine and Mandibular First bicuspid which are free from morphological abnormalities and have completely erupted clinical crown of the said teeth in the Oral cavity

The subjects were made to sit comfortably on the physiological dental chair and a thorough planned detailed case history and thorough clinical examination was carried out on the subjects. The subject were asked for written consent by filling up the consent form along with their signatures. Subjects were instructed to remove accessories like spectacles, nose studs, ear rings and other metallic items from the region of head and neck. After standardized digital orthopantomographs with no positional errors were taken and procuring the authenticated date of birth certificates, the certificates were filed after being numbered from 1- 100 being part of a blind setup. The measurements were carried out on the orthopantomographs for all six types of teeth using dimaxis digital software as the measurement aiding tool, Using the mouse-driven cursor, the reference points on the images of the teeth were defined and the numbers of pixels within the defined line were given which was converted to millimeters. Regression formulae based on statistical analysis were calculated using and different regression formulae for all six teeth, three maxillary teeth only, three mandibular teeth only and each individual tooth were derived and age was assessed, the assessed age was then co-related with the actual age of the patient.

Results

This study included 100 subjects of either sex between age group of 20 to 60 years for assessment of age out of which 57 were males and 43 were females. For these subjects, age was assessed using Kvaal et al's method. Age was assessed for all the subjects by regression using two predictors, where "M" was the first predictor and "W-L" was the second predictor. The correlation between age and the ratios of measurement from each tooth i.e. ratio between pulp length and root length (P), ratio between root length and tooth length (T), ratio between pulp length and tooth length (R), ratio between width of pulp and width of root at the level of cemento-enamel junction or level a (A), ratio between width of pulp and width of root at the mid point between cemento-enamel junction and mid root level i.e. level b (B), ratio between width of pulp and width of root at the mid root level or level c (C), mean value of all ratios (M), mean value of width ratios from level b and c (W), mean value of length ratios 'P' and 'R' (L), and difference between 'W' and 'L' (W-L), was carried out using SPSS (V 13) software. It was seen that there was a significant correlation between age and 'M' (0.200) and 'W-L' (- 0.163) for lower lateral incisor (table no. 1).

From the results of regression analysis (table no. 2), it was observed that the coefficient of determination R^2 is highest (0.517) for "lower first premolar" indicating that age can be estimated better with this particular tooth when "M" and "W-L" are considered as predictors of age. Both "M" & "W-L" were found to be significant predictors ($P<0.05$). These predictors (M & W-L) were found to be effective in estimating age when used for "Upper CI" (R^2 =0.178) and lower canine (0.134). Both M and "W-L" was found to be significant here ($P>0.05$).Similarly, the next best teeth was found to be "Lower lateral incisor" for estimating age using "M" & "W-L" (R^2 =0.134) (table no.3). This was followed by upper second premolar, Upper Lateral Incisor. It was observed that the coefficient of determination R^2 was higher (0.478) in lower three teeth taken together compared to upper

three teeth (R^2 =0.049) (table no.4). When all the six teeth were taken together it was found that both "M" and "W-L" were significant predictors and the co-efficient of determination was high (R^2 =0.430) . From the above discussion we can therefore conclude that lower first premolar would be the better tooth to be used for estimating age. The age of the subjects were then estimated by substituting the values of "M" and "W-L" in the regression equation using each individual tooth, upper three teeth together, lower three teeth together and for all six of them combined, and this estimated age was compared with the actual age using student's t-test . From the comparison of actual age and estimated age we observe that there is no significant difference between the mean actual age and the mean estimated age in Lower Canine, Lower Lateral Incisor, Lower first premolar, Upper second premolar, Upper Lateral Incisor, Upper Central Incisor, Upper three teeth when taken together, Lower three teeth when taken together and all the six teeth taken together (P>0.05)(table no. 5).

TABLE 1 :The correlation between age & the ratios of measurement for all six teeth

TABLE 2: Regression Analysis For All Six Teeth

TABLE 3: Mean of Different Ratios For Lower Three Teeth

TABLE 4 :Mean of Different Ratios For Upper Three Teeth

TABLE 5: Comparison of estimated age with actual age for upper & lower three teeth

Discussion

A study based on the concept that with advancing age the size of pulp cavity is reduced because of secondary dentin deposit had been carried out in 1994 as an indicator of age by Kvaal et al in Oslo [9]. In the present study the six teeth that were selected from both the jaws showed no significant difference in measurements between the teeth from the left and right side of the jaws, which is in consistence with the earlier study conducted by Kvaal et al. In Kvaal's study,

regression formula derived for all the six teeth together, substituting 'M and 'W-L' showed significant results with coefficient of determination being the strongest (R^2= 0.76) but in our study, lower first premolar was the strongest predictor (R^2=0.517).

When the calculated age was compared with actual age in Kvaal's study, they found no significant difference between the two when taking all six teeth together and mandibular three teeth together (P>0.05), which is similar to our study. In our study coefficient of determination for all the six teeth taken together (0.430) and lower (mandibular) three teeth (0.478) is almost similar. Further in Kvaal's study they found a significant difference between the calculated age and the actual age when taking maxillary three teeth together or each of the six teeth individually. But in our study, we got no significant difference between the two when taking maxillary three teeth together or each of the six teeth individually (P>0.05).

The difference in the results obtained could be on the fact that the software used to measure in Kvaal's technique on digital orthopantomographs was Adobe Photoshop (version7.0) but in this study, we used Dimaxis software as the measurement tool. In our study, we have used digital orthopantomographs for assessment of age, whereas study by Kvaal et al used the intraoral periapical radiographs and Nathalie Bosman et al used orthopan-tomographs for obtaining the regression formula.

Therefore, we conclude that "M" and "W-L" values derived from Lower Canine, Lower Lateral Incisor, Lower first premolar, Upper second premolar, Upper Lateral Incisor, Upper Central Incisor, Upper three teeth when taken together, Lower three teeth when taken together can be used as the predictors to estimate age of a person. It is also viable to take the "M" and "W-L" values of all these tooth together. Hence we conclude that "M" and "W-L" can be considered as predictors for estimating age.

Conflict of interest

None Declared

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Original Research Article

UV Spectrophotometric Detection of Cephalosporin Antibiotics in Forensic Samples

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Abstract

The present study describes simple, precise, cost effective U.V –Vis Spectrophotometric method for the estimation of cephalosporin antibiotics in forensic samples. The solvent used throughout the experiment was methanol. The absorption maxima of cephalosporin antibiotics were found to be 249, 241, 253, 238, 239, 239, 241, 247, 241 and 239 nm for Ceftriaxone, Cefixime, Cefepime, Cefpodoxime, Cefazolin, Cefpirome, Cephalexin, Cefotaxime, Cefuroxime and Cefadroxil respectively. Beer law was obeyed in the range of 2-20microgram/ml. The recovery values of cephalosporin antibiotics in forensic samples found to be less than or equal to 70%. Hence the proposed method is applicable for quantitative determination of cephalosporin antibiotics in forensic samples.

Key Words:- Cephalosporin, forensic samples, U.V spectrophotometer

Introduction

Chemically cephalosporin are similar to penicillin having beta lactam ring joined with dihydrothiazine[1]. It is produced by Cephalosporium fungus[2], derivative of "Cephalosporin C" and are semi-synthetically produced. These are widely used in severe infections of respiratory, urinary tract, and typhoid fever. They restrict the growth of various gram positive and gram negative bacteria[3].

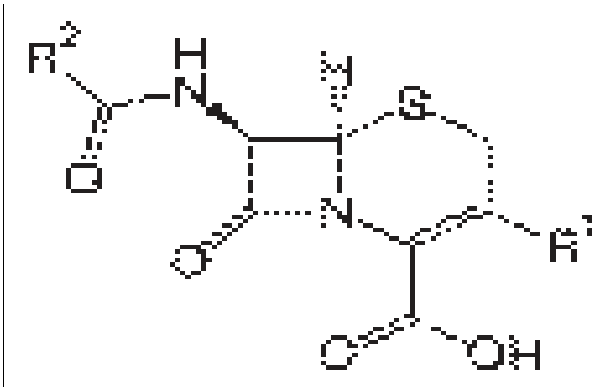


Fig 1: General structure of Cephalosporin antibiotic.

Cephalosporins are categorized into four groups, called Generations based on advancement in their nature and antimicrobial activities. All the Cephalosporin antibiotics classified under these four generations cover wide antibacterial spectrum [(4-5)].

Detection of any drug molecule in forensic samples is an important task in forensic analytics. A suitable analytical method has to be available for analysis of drug(s) in drug delivery systems in dissolution studies (in vitro) and in biological samples (in vivo) for forensic purposes.

If such method are not available for specific need, then it is mere important task to develop a simple, sensitive, accurate, precise and reproducible method for estimation of drug(s) in forensic samples.

The literature shows that cephalosporin antibiotics have been analyzed by TLC[6], HPLC[7], Potentiometry[8], Voltammetry[9], Spectrofluorimetry[10], and Spectrophotometry [(11-13)]. Thus, the present study is an attempt to detect and

determine a simple, accurate, sensitive, precise and reproducible UV method for cephalosporin antibiotics (of different generations) in forensic samples.

Material and Methods

A. *Instruments and materials:*

The instrument used were a double beam thermo helio spectrophotometer with range of 190-280nm and band width of 1 nm (fixed) with room temperature between 20-25°C. Mettler toldeo analytical precision balance. The cephalosporin pure drug was obtained from IPC with 99.9% w/w assay value and was used without further purification. Different forensic samples including viscera, blood and gastric lavage. All chemicals and reagents used were of analytical grade.

B. *Preparation of standard stock solution:*

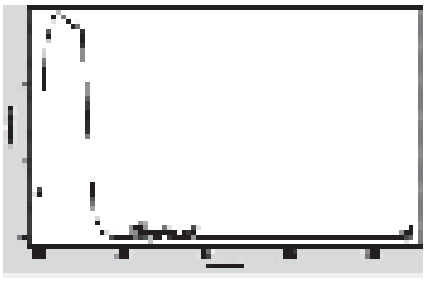
A standard drug solution of all cephalosporin antibiotics was prepared by dissolving 10 mg of each cephalosporin in 10 ml of methanol, and this was transferred into 100 ml volumetric flask. The volume was brought up to the mark with methanol to obtain a stock solution of each cephalosporin with 100 microgram/ml final concentration. The solution was further sonicated for 15 minutes to obtain clear solution.A.

C. *Preparation of working solution:*

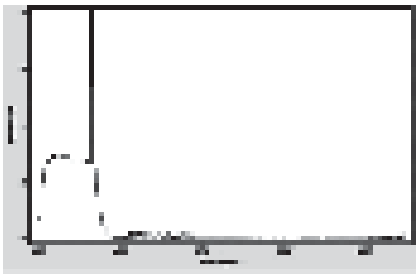
From above stock solution, a 2 ml sample was transferred into 10 ml volumetric flask and the volume was made up to the mark with methanol to prepare a concentration of 20 microgram/ml. The sample was further scanned by UV spectrophotometer in the range of 200-400 nm using methanol as a blank. The wavelength corresponding to the maximum absorbance was found to be 249, 241, 253, 238, 239, 239, 241, 247, 241 and 239 nm for Ceftriaxone, Cefixime, Cefepime, Cefpodoxime, Cefazolin, Cefpirome, Cephalexin, Cefptaxime, Cefuroxime and Cefadroxil respectively nm. This was further utilized to obtain a calibration curve.

Absorption curves for Cephalosporin Antibiotics

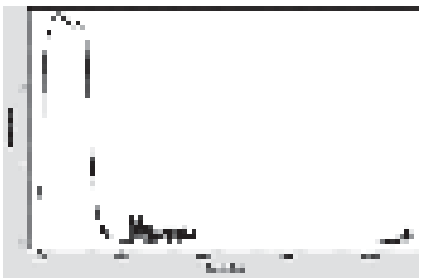
Graph 1: Absorption maxima for Ceftriaxone (249 nm)



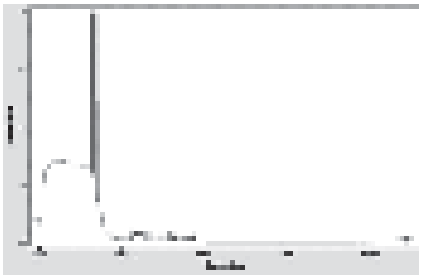
Graph 2 : Absorption maxima for Cefixime (241 nm)



Graph 3 : Absorption maxima for Cefepime (253 nm)

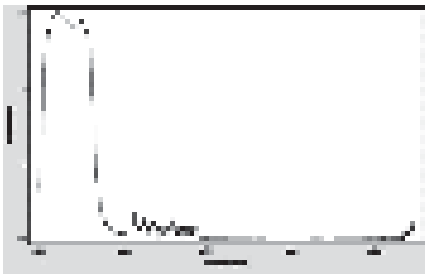


Graph 4 : Absorption maxima for Cefpodoxime (238 nm)

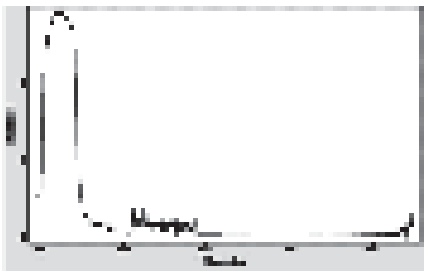


Graph 5 : Absorption maxima for Cefazolin (239 nm)

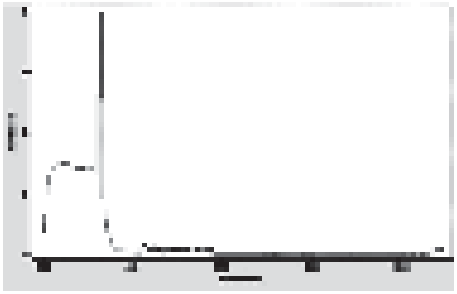
Graph 6 : Absorption maxima for Cefpirome (239 nm)



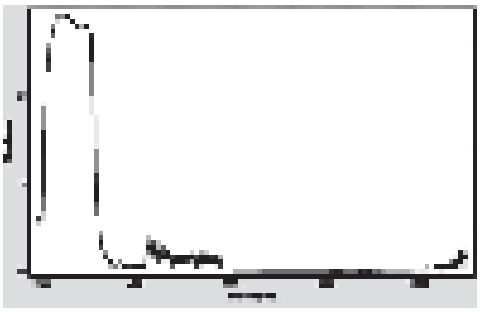
Graph 7 : Absorption maxima for Ceftriaxone (241 nm)



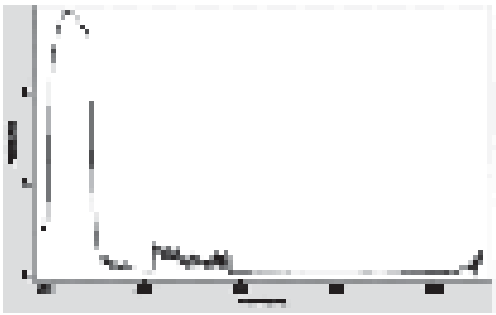
Graph 8 : Absorption maxima for Cefotaxime (247 nm)



Graph 9 : Absorption maxima for Cefixime (287 nm)



Graph 10 : Absorption maxima for Cefuroxime (249 nm)



A. Preparation of sample solution:

From stock solution, 1 ml volume of drug is spiked in 4 ml of forensic samples like blood, gastric lavage and viscera respectively. Therefore, final volume of sample solution results 5 ml with final concentration of drug in each sample found to be 4 microgram/ml as follows:

$$C_1V_1 = C_2V_2$$

$$20(1) = C_2(5)$$

$$20 = 5\,C_2$$

$$20/5 = C_2$$

$$4 = C_2$$

Where = C_1 = Spiking concentration of drug

V_1 = Spiking volume of drug

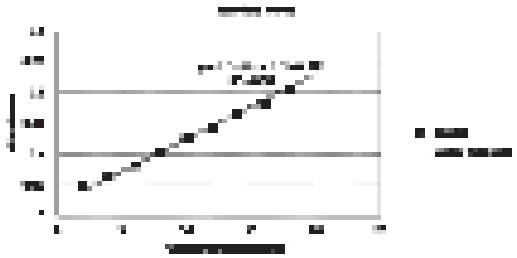
V_2 = Volume of sample at time of spiking

C_2 =

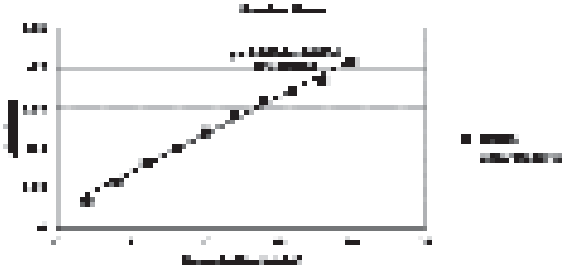
B. Preparation of calibration curve:

Various aliquots of cephalosporin antibiotics were prepared from the stock solution (100 microgram/ml) ranging from 2-20 microgram/ml. The samples were analyzed with the help of UV spectrophotometer, using methanol as blank. The linearity of above mentioned samples (Cephalosporins) are observed in the Curve (1-10) and tables (1-2).

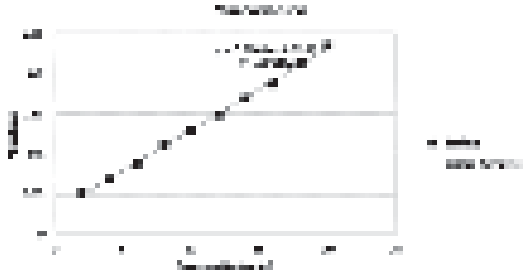
Curve 1 : Calibration curve for Ceftriaxone



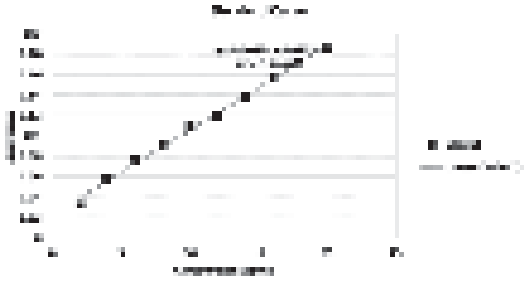
Curve 2 : Calibration curve for Cefixime



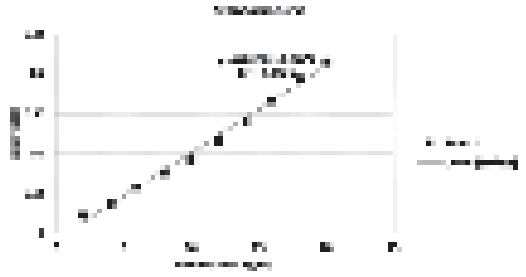
Curve 3: Calibration curve for Cefepime



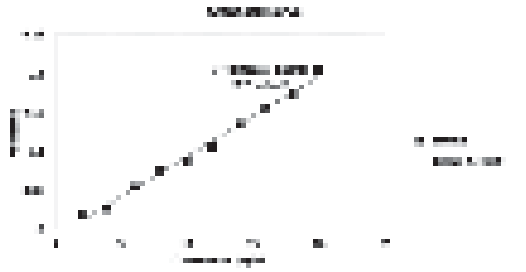
Curve 4 : Calibration Curve for Cefpodoxime



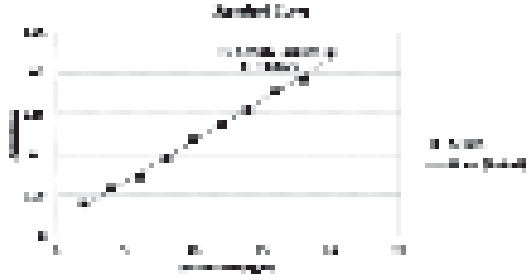
Curve 5 : Calibration curve for Cefazolin



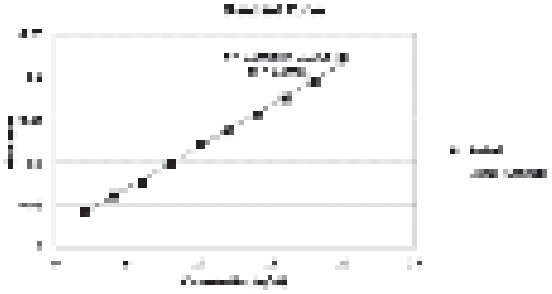
Curve 6: Calibration curve for Cefpirome



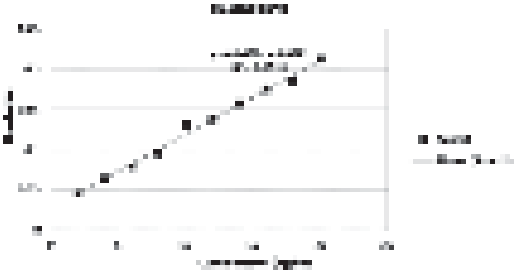
Curve 7: Calibration Curve for Cephalexin



Curve 8: Calibration Curve for Cefotaxime



Curve 9 : Calibration curve for Cefuroxime



Curve 10: Calibration Curve for Cefadroxil

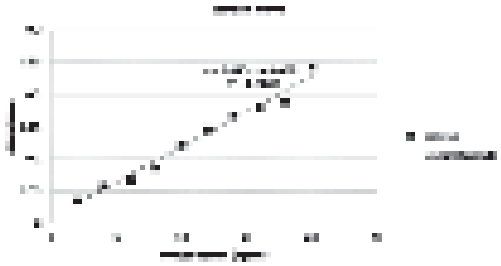


Table 1: Absorbance values of various Cephalospor in Antibiotics at different concentration

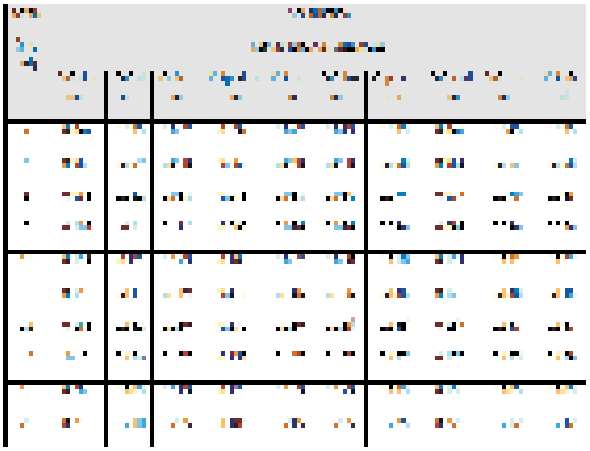
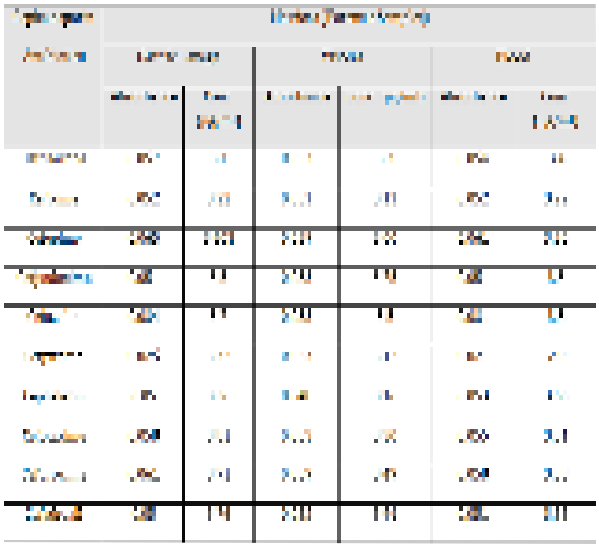


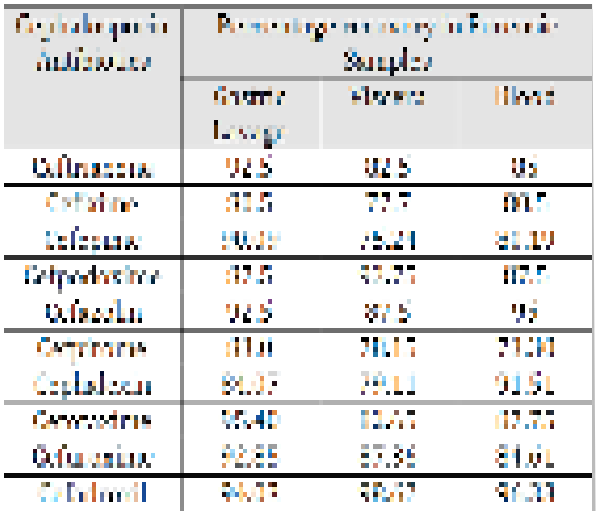
Table 2: Concentration values determined of various Cephalosporin Antibiotics in different forensic samples (Matrices)



I. Results and Discussion

The calibration curve of each cephalosporin antibiotic in methanol was found to be linear in the concentration range of 2-20 microgram/ml [curve 1-10]. The developed method was found to be specific as % recovery values were greater than or equal to 70. The results of the assay showed that the amount of drug detected in forensic samples are in good agreement.

Table 3: Percentage recovery of different Cephalosporin Antibiotics in various Forensic samples



I. Conclusion

The study concludes that the proposed method is simple, sensitive, precise, accurate and cost effective. Also, this method can be applied successfully for the estimation of different cephalosporin antibiotics in forensic samples.

Acknowledgment

We would like to thank DST, Ministry of Science and Technology for providing INSPIRE fellowship.

Conflict of interest:

None declared

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Original Research Article

The Relationship between Dermatoglypic Pattern of Right Thumb and Physical Health of Medical Students: A Cross-sectional Study.

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Abstract

Background: Dermatoglyphics serve as a tool to describe and predict occurrences of certain diseases. Present study was conducted to assess the relationship between right thumbprint, general health problems and health practices among medical students.

Materials and methods: A total of 143 undergraduate medical students, 54 males, and 89 females, participated in the study. Validated questionnaires were used, and the right thumb impression from the students was collected. The fingerprints were grouped, and was correlated to the health problems faced by the students.

Results: Most common fingerprint pattern found among the students was the whorl pattern (n=55), followed by the radial loop, arch and ulnar loop. Majority of students with ulnar loop had dental problems (40%); they were also more prone to allergies (75%), used spectacles or contact lens (70%). Students faced hair fall problem and the percentage was high among the students with radial loop and arch pattern. Students with loop patterns exercised often, and this percentage was less among the other students.

Conclusion: Percentage occurrence of common health problems like allergies, hair fall, acne and usage of spectacles was high among the students with loop pattern mainly ulnar loop.

Keywords
Dermatoglyphic, fingerprint, health, disease.

Introduction

Recent scientific research has acknowledged the hand as a useful tool in the diagnosis of psychological, genetic and other medical conditions. The term dermatoglyphic refers to the study of naturally occurring patterns on the surface of hands and feet [1]. The epidermal ridges form a definite pattern on the terminal segments of the digits which have been classified by Galton as arches, loops, whorls and composite [2]. It has been a topic of interest among various scientific researchers to determine a relationship between fingerprints and various medical conditions [3]. Determining the fingerprint patterns is a non-invasive procedure. Findings from previous studies postulate that there exists a relationship between certain diseases, including genetic disorders, mental retardation, and fingerprint patterns [4, 5, 6]. Because of this, the subject of dermatoglyphics is developing its importance in everyday life and in fields like biology, anthropology, genetics and medicine. Study of fingerprint pattern may serve as a tool to describe and predict occurrences of certain diseases. Employing this noninvasive detection method may contribute to the rapid and cost-efficient diagnosis of any disease. During our literature review, we came across studies which correlate dermatoglyphics with chronic disease conditions. But there are no studies on dermatoglyphics and general physical health. As per our knowledge, this is the first study done to explore the relationship of various patterns of thumbprint and physical health. Hence the present study was conducted to assess the relationship between right thumbprint, general health problems and health practices among medical students of Malaysian and Srilankan ethnicity.

Methodology

Sample size:

A total of 143 undergraduate medical students, 54 males, and 89 females, aged 17-19 yrs. participated in the study. Their participation was purely on voluntary basis. Respondents gave their informed consent before taking part in this study. The majority of students belonged to three different ethnic races of Malaysia i.e. Malays, Chinese and Indians (Malaysian Indians) and a few students were from Sri Lanka. The study was conducted after obtaining institutional ethical clearance (Reg: Reg: IEC 802/2015).

Materials and Methods

Questionnaires, stamp pad, manila card, tissues, ink remover

Data collection

Validated questionnaires were used in the present study. The questionnaire included student's demographic data, questions on the various health problems faced by the students, their sleep pattern and health practices. At the end of the questionnaire, the right thumb impression from the students was collected using a stamp pad. The students were asked to place their right thumb on the stamp pad and then asked to place it on the paper. The thumb was rolled from one side to another to get a complete impression. This process was monitored carefully to confirm we obtained a proper thumb impression without any overlap. The responses given by the students to the questions were then analyzed. Dermatoglyphic patterns recorded was studied using a magnifying lens.

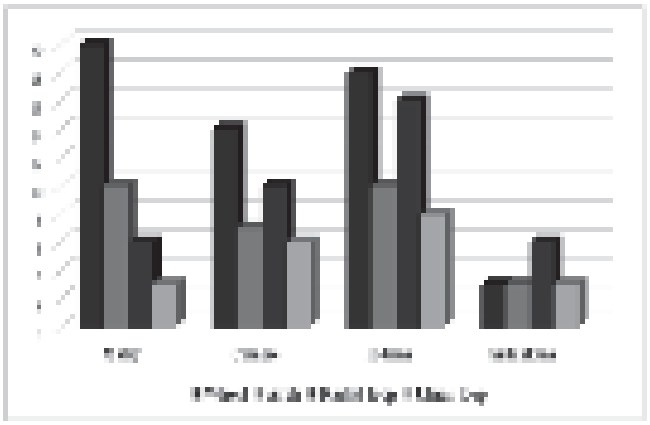
Data analysis:

The data obtained was first segregated according to gender, and then according to race. The fingerprints were classified and grouped into patterns, and it was correlated to the health problems faced by the students and their health habits. Results obtained were expressed in percentage. Suitable graphs were used to present the results.

Results

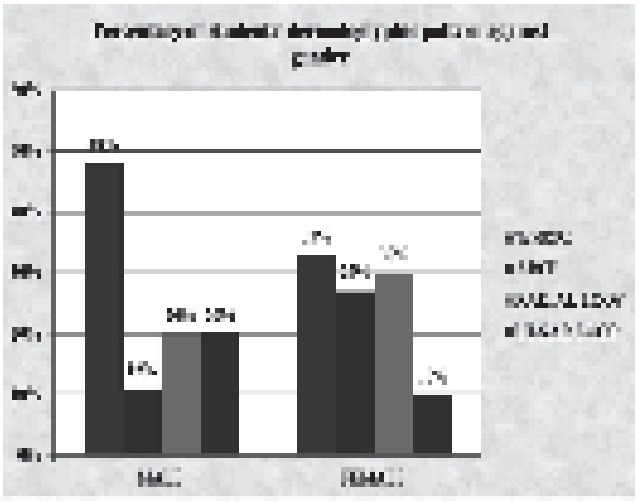
The fingerprints obtained from the students were grouped into four dermatoglyphic patterns: Whorl, arch, radial loop and ulnar loop. The most common fingerprint pattern found among the students was the whorl pattern (n=55), followed by the radial loop (n=38), arch (n=30) and ulnar loop (n=20). Commonly seen fingerprint pattern among the Malay, Chinese and Malaysian Indians was whorl pattern. While among the Sri Lankan students, the radial loop was the commonest pattern [Graph 1]. When we compared the fingerprint pattern with gender, we found that majority had whorl pattern (48% male, 33% female), followed by the radial loop (20% male, 30% female) [Graph 2]. We then correlated the fingerprint pattern with health problems faced by the students. Most students with ulnar loop had dental problems (40%) and were also more prone to allergies (75%). While the percentage occurrence of these problems was less among students with other patterns [Graph 3, Graph 4]. The majority of students with ulnar loop used spectacles or contact lens (70%) and 40% of them had underwent LASIK treatment. Less percentage of spectacle usage is seen in students with arch pattern (67%), radial loop (61%) and whorl pattern (56%). Most students faced hair fall problem and the percentage was high among the students with radial loop and arch pattern [Graph 5]. Acne was another common complaint among the students of the ulnar loop and arch pattern [Graph 6]. It was seen that majority of students usually slept for 6 to 8 hrs. [Graph 7]. Students with ulnar loop and radial loop exercised often, and this percentage was less among the other students [Graph 8]. To check if these health problems related to their habits, we asked the students if they smoke and consume alcohol. It was found that the percentage was high among students with ulnar loop (55% smoke, 40% drink alcohol), while among other students the percentage was very less (whorl: 10% smoke, 16% drink alcohol; arch: 7% smoke, 20% drink alcohol; radial loop: 8% smoke, 21% drink alcohol).

Graph 1:



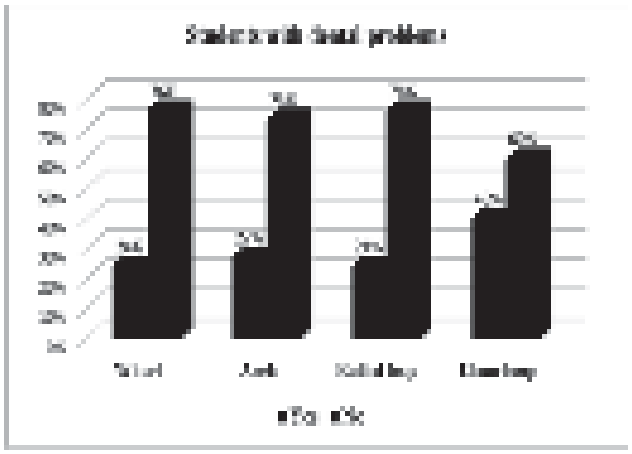
Graph showing the racial distribution of fingerprint pattern among the students.

Graph 2:



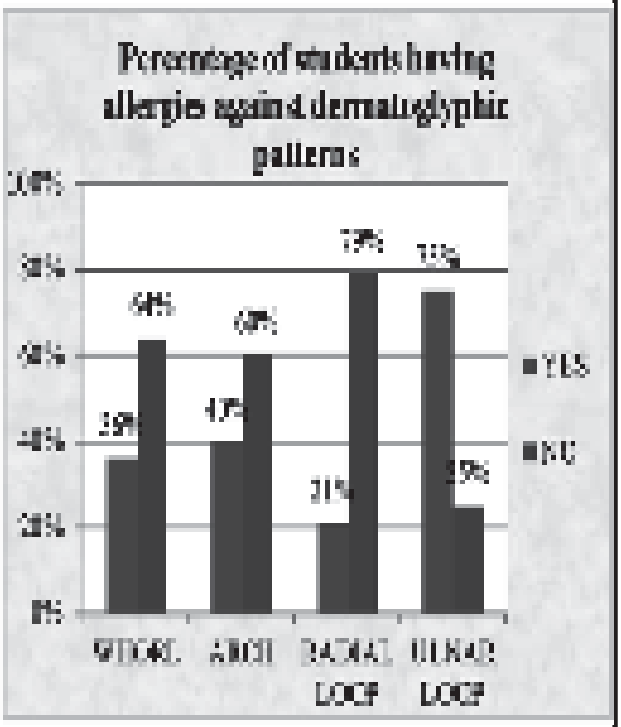
Graph showing the distribution of dermatoglyphic patterns based on gender

Graph 3:



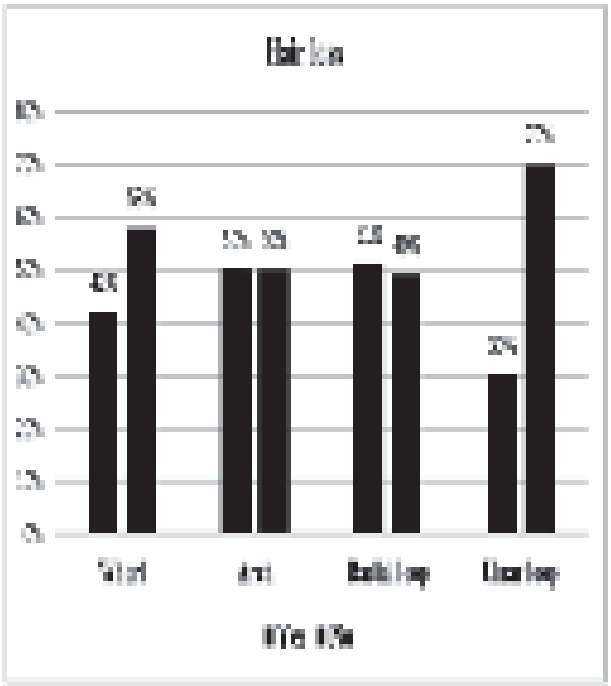
Graph showing the occurrence of dental problems among the students of different dermatoglyphic patterns.

Graph 4:

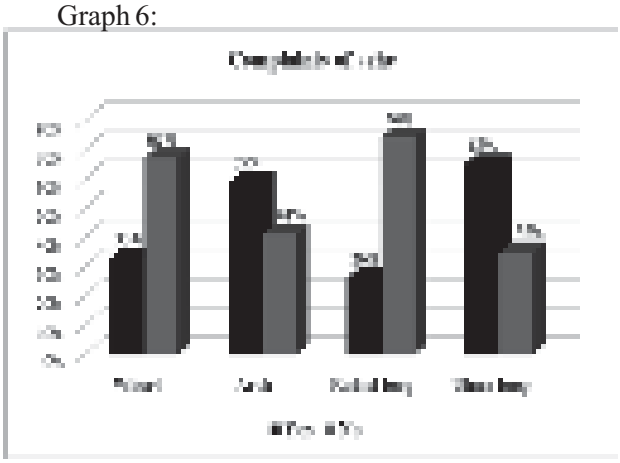


Graph showing the relation between dermatoglyphic patterns and allergy problems.

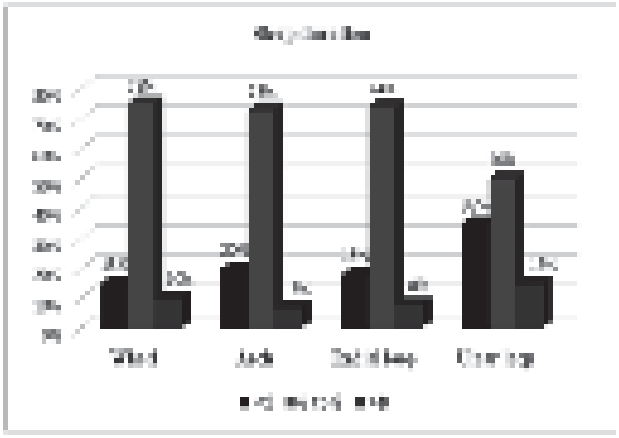
Graph 5:



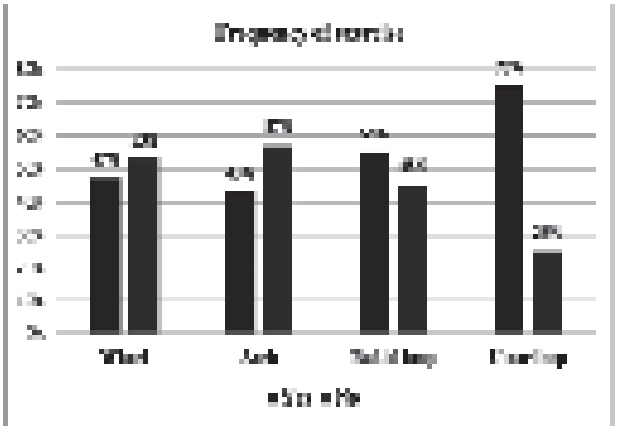
Graph showing the relationship between dermatoglyphic pattern and the hair fall.
Graph 6:



Graph showing the relationship between dermatoglyphic pattern and acne.
Graph 7:



Graph showing the relationship between dermatoglyphic pattern and sleep habit.
Graph 8:



Graph showing the frequency with which students exercise against the dermatoglyphic patterns

Discussion

In recent years, the hand is recognized as a powerful tool in the diagnosis of psychological, medical problems and genetic conditions, through decades of scientific research. There are many studies which focus on chronic diseases and relate it to dermatoglyphics. We must note one thing here that maintaining the general health of body and wellbeing throughout lifetime, prevents most of the chronic diseases. But studies covering the topic of general health are very less. Hence in our study, we have tried to establish a correlation between the general health of medical students and their dermatoglyphic patterns.

Analysis of the frequency of fingerprint patterns from this study showed that whorl and loop patterns were the most occurring patterns. This finding was similar to the reports of Oladipo et al. and Nanakorn et al., [7,8]. But there are a few studies which have shown that loop pattern is the most common fingerprint pattern [9,10] which suggests that dermatoglyphic patterns vary among different populations. There are a few studies which relate dermatoglyphics to diseases. The fingerprint patterns have been used as an oral health marker, which is stated to determine the genetic predisposition of an individual to dental caries [11]. Sontakke et. al., have found through their study that there was a significant reduction in the loop patterns and increase in whorl patterns in the disease conditions [12]. Similar findings were also observed in other studies which have demonstrated that major health problems such as diabetes, hypertension, cardiovascular diseases are associated with high frequency of whorl pattern and reduction in loop pattern [13, 14, 15]. But, Madhusudan et al., in their study have found that prevalence of dental caries was higher among subjects with loop pattern (67.0%) compared to other thumbprint patterns. This finding coincides with our study finding in which we found that students with ulnar loop pattern were more prone to dental problems. We also observed that the percentage occurrence of common health problems like allergies, hair fall, acne and usage of spectacles was also high among the students with loop pattern mainly ulnar loop. During our literature review, we did not find studies which support this view. Hence it can be hypothesized by our observation that chronic

diseases are linked to whorl pattern, and general health problems can be linked to loop fingerprint pattern. However, further studies with larger sample sizes are needed to substantiate our findings.

Conclusion

Dermatoglyphics is a growing discipline and renders as a useful tool to the clinician as it is easy, feasible and readily applicable. The study of dermatoglyphics is not to diagnose, but to prevent a disease by predicting its occurrence. But more studies in this regard need to be carried out to use this method efficiently.

Conflict of interest

None declared

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Original Research Article

Significant factors affecting the investigation of Sexual Assault Cases

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Abstract:

Sexual offence is a serious social problem worldwide taking place at different levels of society. Such offence occurs in the form of sexual violence which causes serious effects upon the physical as well as mental condition of the victim. Present study deals with the different factors affecting the investigation of sexual assault cases. The study focuses on different factors that play a crucial role during the investigation of such types of heinous crimes. Seventy cases of sexual assault have been selected for the study from Delhi-NCR, India. These cases were having different reason for improper and incomplete investigation of sexual assault cases like delaying in reporting cases, statement of the victims, lack of judiciary support, the role of media, and the role of community.

Keywords:
Sexual assault, investigation, various factors

Introduction:

Sexual offence is defined as any type of sexual contact or behavior that occurs without the accurate consent of the recipient. It is not the problem of our country but it's the problem increasing worldwide. There are various factors which plays a very important role while investigation or to arrest the offender of the case. Different investigating protocols for investigation of such types of crime have been developed in various countries but India is lacking in developing uniform standard protocol for the investigation of sexual assault cases and victims support. Delay of complaint to police is a common feature of sexual assault cases, particularly where the complainant remains a child who has lack of knowledge about the assault and accused. In such cases, the alleged offender is mostly trusted person of the family, teacher, coach or spiritual leader.

The Australian Law Reform Commission (ALRC) vide its report [1] concluded that a child's failure to immediately report the matter may adversely affect particularly when the accused is adult holding the higher position. [1]

It expected that delayed reporting into adulthood is necessarily associated with degraded evidence or unavailable witnesses and a reduced likelihood of proceeding to prosecution. It indicates that adults do report, they are committed witnesses and more able to articulate their evidence. [2]

According to the Bureau of Justice Statistics reports the majority of rapes and sexual assaults in the United States between 1992 and 2000 were not reported to the police. Only 36 % of rapes, 34 % of attempted rapes, and 26 % of sexual assaults were reported. There were various reasons for not reporting of sexual assault self blame, embarrassment, insult and lack of judiciary support. [3]

Interviewing the victim or the statement of the victim of a sexual assault also play a very important role while investigating the case. In New York State the entire police department provides a private setting area for the interview of

the victims of such crime. Private setting means a confined room from which the victim and interviewer are not visible or identifiable to anyone else, and whose conversations cannot be heard from outside the room. Rape Crisis Center advocate is provided with the victim during the interview process. [4]

A victim impact statement in her own words is a valuable tool for the investigation of such cases. It may be written or oral information about the crime and how it has been affected them. In USA, states allow victim statements as important phase of the sentencing process. Victim statement information is generally included in the pre-sentencing report presented to the judge and if required before parole hearing of the accused. The main purpose of victim statements is to describe to the court or parole board the impact of the crime. A judge may use information from these statements that helps to determine an offender's sentence while a parole board may use such information to help decide whether to grant a parole and conditions of the accused after release. A few states allow victim impact information to be introduced at bail, pre-trial release, or at hearings. Generally, victims are not called to testify in court, and if they testify, they are required to respond to small and specific questions. It becomes an opportunity for the victim to participate in the criminal justice process and to confront the offenders. Most states allow victims to present oral or written statements. Some states allow victims to record impact statements on videotape, audiotape, or other electronic means, particularly for use at parole hearings. Child victims can submit drawings to describe how the crime affected them. Some states require judges to include victim statements in their deliberations. Offenders are usually allowed to challenge the accuracy of the facts given by victim statements.

Victims of child sexual abuse may pursue justice through both the criminal and civil justice systems. There are two significant differences between the two court systems: the burden of proof necessary and the role of the victim in each process. Most crime victims have the right to file a civil prosecution seeking financial compensation from the perpetrator or from others whose unreasonable conduct gave rise to conditions that allowed the crime to occur. It is possible to find the suspect liable in a civil case even though an opinion of "not guilty" was carried out in the criminal case. According to a news report in Canada, 53% of sexual assault victims stated that they were not confident in the police; two-thirds stated that they were not trusted in the court process and in the criminal justice system. The common reasons for not reporting were feeling shame, embarrassment, and fear of the offender and lack of confidence in the justice system. [6]

The uses of modern electronic gadgets have been increased in the commission of sexual assault cases. Now a day the Internet has become a rapidly increasing powerful tool for victims to find out information and support. However, the Internet has also played a growing role in sex crimes. Cyber stalking—threatening behavior or unwanted advances using the Internet or other high-tech communication is a well documented problem. Mobile phone, surveillance, and computer technologies provide new ways to harass or intimidate victims. Photos or video taken during a sexual assault can be quickly and widely shared, creating further trauma for victims. A recent youth survey, while not specifically assessing sexual victimization, illustrates the popularity of online harassment of adolescents (2006 Youth Internet Safety Survey).Using quick messaging, sites, and chat rooms each increased a youth's risk of Internet harassment. Controlling the excessive use of the Internet is difficult. [7]

Materials & Methods

The sample of the present study comprised of the females who complained of sexual assault of different age groups. Data were collected from different rehabilitation centers in Delhi- NCR and court proceedings. All the 70 women who comprised the sample of the present study were

personally interviewed with a pre-designed, structural interview schedule. The subjects were assured of the confidentiality and anonymity of their responses.

Results

The results of the present study carried out on victims have been analyzed. 72% victims were found to reporting incident was to be delayed out of which 10% of the cases were reported within 24 hours, 12% of the cases reported on second day i.e.24-48 hours as delay in reporting the case will affect the investigation process, 19% of the cases reported on third day i.e. after 72 hours i.e. 48-72 hours and the maximum number of cases i.e. 31% reported after three days or more than three days as a result of which quality of investigation affected by the delay in reporting the incidence and the process. The evidential proof get destroyed that affect the investigation procedure. [Table 1]

In 75% of the cases, the clear-cut statement were not given by victims as the investigation of such types of cases mainly depends upon the interview or the statement of the victims while reporting, only 9% of the victims were ready to give the interview regarding the case. In 15% of the cases victims given the self statements in their own words without anybody's pressure, 21% of the cases give statements under the family, friends and the social pressure. Maximum number of cases i.e. 30% of the cases were not agrees to give the statement and the interview process. [Table 2]

70% of the victims do not believe in the judiciary support as they suffers from long-term effects of being attacked, including depression, difficulties with trust and forming relationships, and anxiety, fear and stress. In 40% cases victims believes that because of the long processing and the mental or financial loss they stop the case or do not file a case whereas in 30% of the cases victims don't trust on the investigation system followed by the police personals. [Table 3]

Out of 85%, in 35% cases victims feels fear from social media and in 50% cases victims get mentally harassed from the excessive use of the internet among all age group people especially youngsters. [Table 4]

79% of the victims has affected by community as out of this only 15% victims has support from friends and family while in 10% cases they got the financial and the commercial support from the society. In 21% of the cases reduced the chances of likelihood marriage means they don't have choice to get marry according to their wish and the maximum number of cases i.e.33% they are not accepted by the society for marriage as they get sexually assaulted. [Table 5]

Discussion:

In today's society, a large numbers of females are becoming victims of sexual assault. This has to become a growing concern among society. According to the NCRB record in 2015 the total number of 34, 651 cases were reported across the India. Though 27.5 Million females were sexually assaulted but only 1% of the victims report to the police in India. [8]

In most of the cases there is delay in reporting the case to the police means the cases are not reported on time but in the present study, 72% of the cases are not reported within time as it directly affect the all investigation procedure. There is logical connection between delay in reporting and its investigation. It is all related to the all procedures of MLC (Medico Legal Care of victims), reach to the crime scene before the destruction of the evidences, collection of proper evidences, examination of the evidences and the report through which we can get the proof against actual suspect(s) that leads to the timely conviction of the offender.

Victim statement is another major factor that disturbs the investigation in these types of cases i.e. in 21% of the cases victims' gives statement under the family, friends and the social pressure or in few cases victims gives statement in her own words. Maximum numbers of the cases victims were not ready for the interview process. Interview should be held in a private room or area

from where nobody can hear the voice. The interview should be conduct in that manner that a victim reveals all the information needed for investigation. This is the duty of the interviewer to look after all these matters of concern regarding statement and the interview.[5]

70% of the victims do not believe in the judiciary support as they suffer from long-term effects of being attacked, including depression, anxiety, fear and stress. The time has been taken by judicial system to bring some level of justice to them, especially since many loopholes currently exist. In 40% cases victims suffers from long term processing of the judicial system and in 30% cases victims do not believe on the police investigation system because they believes that they mistreat the victims or blaming them for this .

The excessive use of internet and the use of smart phones with different apps related to the social sites leak the information very quickly so 85% victims feels fear from media, social networking sites and are traumatized.

79% of the victims has affected by community as cultural, communication and systemic barriers because of lack of appropriate services like minimum number of the people give financial and the commercial support, chances of likelihood marriage get reduced support and the large number of people not accept the girl as their bride or daughter in law.

This paper focuses on community-based approach in accountability and for victims of sexual assault. The treatment result depicts the following need to i) to educate community members and service providers about the procedure and treatment programs, ii) to offer victims support, and iii) to bring awareness about the timely reporting the case. iv) to developed confidential level among the victims v) to give special training to the police personals. [7]

It is concluded that, if all this procedure followed during investigation it will increase the more number of reporting cases, victims feels safe while interviewing and no offender will live scot free and victims cope up with these entire trauma.

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Conflict of interest:

None declared

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Following tables shows some of the major factors that affect the investigation process in the case of sexual assault:

Table 1: showing in delay in reporting the case:

Factors	Percentage Rate
After 24 hours	10%
After 48 hours	12%
After 72 hours	19%
Or more than 3 days	31%
TOTAL	72%

Table 2 showing statement of the victim

Factors	Percentage Rate
Agree for the interview process	9%
Not agree for the interview process	30%
Self statement	15%
Statement under pressure	21%
TOTAL	75%

Table 3 showing lack of judiciary support

Factors	Percentage Rate
Long term processing	40%
Trust on investigation system(police personals)	30%
TOTAL	70%

Table 4 showing role of medi

Factors	Percentage Rate
Fear of social media	30%
Excessive use of internet	50%
TOTAL	85%

Table 5 showing role of community

Factors	Percentage Rate
Lack of family and friends support	15%
Reduced likelihood marriage	21%
Financial and commercial support	10%
Non- acceptability in the society	33%
TOTAL	79%

Original Research Article

Sexual Abuse – Councelling and Prevalence in Female School Children in Patiala

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Abstract

Child sexual abuse is a global phenomenon but being under reported. It has serious physical and psycho-social consequences that adversely affect the health and overall well being of the child. There is acceptance of the fact that girls are not safe in India, which has the largest number of sexually abused children, yet the subject is a taboo here. CSA has received considerable attention since late 1970s from medical, mental health, legislative, judicial and law enforcement professionals, as well as media and the lay public, making it the most researched form of child maltreatment. This blind, cross-sectional study is aimed to throw light on the patterns of sexual abuse and the effect of counselling on the reporting of sexual abuse among female school children in Patiala city.

Key Words
Child sexual abuse, counselling, reporting, psycho-social, Mc Nemar chi square p, taboo, abuser, step-father, incest,

Introduction

According to WHO, [1] Child Sexual Abuse (CSA) is the involvement of a child in sexual activity that he or she does not fully comprehend, is unable to give informed consent to, or for which the child is not developmentally prepared and cannot give consent, or that violates the laws or social taboos of society. CSA is evidenced by this activity between a child and an adult or another child who by age or development is in a relationship of responsibility, trust or power, the activity being intended to gratify or satisfy the needs of the other person. It has serious physical and psycho-social consequences which adversely affect the health and overall well being of a child. This is a globally prevalent phenomenon. However in India, as in many countries, there has been no understanding of the extent, magnitude and trends of the problem. The growing complexities of life and the dramatic change brought about by the socio-economic transitions in India have played a major role in increasing the vulnerability of children to various and newer forms of abuse [2]. India has the world's largest number of sexually abused children, yet the subject is a taboo here. The reason lies in a traditionally conservative family and community structure that does not talk about sex and sexuality. The schools also lack professional counsellors who could talk to children about sexual abuse. This limits children's access to information and choice, and often to the possibility of seeking help outside their immediate circle [3]. This abuse remains grossly under-reported.

Aims and Objectives

- To study the effect of counselling on the reporting of sexual abuse in female school going children.
- To assess the prevalence and knowledge of these children about sexual abuse and the changes brought in the same children following counselling.

Material and Methods

This cross-sectional, blind study was conducted among 509 female children belonging to the age group 12 to 17 years, from both government and private schools in Patiala city. Consent for the study was obtained from the schools, students under study and their parents. The study was approved by the Ethical Committee of Government Medical College Patiala. The age categories were split as 12 – 13, 14 – 15 and 16 – 17 years. The children were asked to fill-up a pre-designated, anonymous questionnaire regarding sexual abuse, in a language they were comfortable with. Then, an age appropriate counselling session was conducted where the children of each age category were addressed as a group. This was followed by a session in which they were asked to fill the same questionnaire again in order to assess if the counselling brought about any change in the knowledge and reporting of sexual abuse. The data thus collected, was analyzed by the chi square test and Mc Nemur's chi square test.

Observations and Results

a. Distribution of the subjects according to the type of school:

The girl students from government schools numbered 281 (55.2 %) and 228 (44.8%) were from private schools.

b. Knowledge about sexual abuse before and after counselling

Before counselling 192 (37.7 %) students knew what CSA was and the number rose to 478 (93.9%) after counselling and the increase in awareness was 56.19 percent.

c. Reporting about Sexual Abuse before and after Counselling:

Only 7 (1.4 %) reported sexual abuse before counselling and the figure rose to 63 (12.4%) after counselling, thus in increase of 11 percent.

d. Source of Knowledge of Sexual Abuse:

The sources of knowledge reported by 478 subjects under study were: Counselling - 286 (59.83 %); school - 87 (18.20%); parents – 53 (11-09%); siblings – 5 (1.05%00); media – 65 (13.60%); internet – 4 (0.84%); friends – 40 (8.37%); movies and others – nil.

e. Gender profile of abusers:

Out of the 63 female victims of CSA, 58 (92.06%) were abused by males and 5 (7.94%) were abused by females. Overall, the total number of female victims was 24 (16.90%).

f. Age at first abuse:

Out of the 63 female victims who had reported being sexually abused, the maximum were abused at 11 to 15 years i.e. 41 (65.08%) followed by 16 (25.40%) at 6 to 10 years, 4 (6.35%) at over 16 years of age and 2 (3.17%) at 0 to 5 years.

g. Familiarity of the abuser:

In the case of 63 female victims, 52 (82.54%) of the perpetrators were known and 11 (17.46 %) were strangers. Among the familiar abusers, 27 (51.9 %) were family members including relatives and 25 (48.1%) were people known outside the family.

h. Relation with the abuser:

The perpetrators were : Uncle, cousin and neighbor : 10 (15.87%) each; brother, family friend and teachers : 5 (7.94%) each; schoolmate: 3 (4.76%); driver : 2 (3.17%) and father and mother in 1 (1.59%) each.

i. Location where the abuse took place:

The most common locations were: Own

house : 28 (44.44%); abuser's house / shop : 14 (22.22%); school / coaching centre: 8 (12.70%); roadside: 7 (11.11%); vehicle: 4 (6.35%); and religious and other places : 1 (1.59%) each.

j. Modes of Sexual Abuse:

Touching / being made to touch private parts / masturbation: 39 (61.90%); made to expose private parts: 7 (11.11%); kissed forcibly, sexual pictures / videos / stories and showing private parts: 6 (9.52&) each; insertion of fingers/ objects into private parts : 4 (6.35%); oral intercourse: 3(4.76%); vaginal intercourse: 2 (3.17%) and anal intercourse : 1 (1.59%). And nude photography: Nil.

k. Frequency of sexual abuse:

57 girls (90.48%) reported being abused once and 6 (9.52%) reported sexual abuse more than once.

l. Feeling after sexual abuse:

The main symptoms reported after sexual abuse included shame: 35 (55.56%); sadness : 31 (49.21%); guilt: 22 (3.92%); discomfort: 5 (7.94%); anxiety: 4 (6.355); poor academic performance: 3 (4.76%); pain and health issues: 2 (3.17%); and reduced self- esteem : 1 (1.59%).

Discussion

Child abuse is a violation of the basic human rights of a child and is an outcome of a set of inter-related familial, social, psychological and economical factors. The problem of child abuse and human rights violations is one of the most critical matters on the international human rights agenda. CSA affects more than 1 in 5 females globally [4]. The WHO in 2002 estimated that 150 million girls under the age of 18 years had experienced various forms of sexual abuse. A review of studies from 21 high and middle income nations showed that 7 to 36 percent females reported being victims of sexual abuse during their childhood [5]. CSA has received considerable attention since late 1970s from medical, mental health, legislative, judicial and law enforcement professionals, as well as media and the lay public, making it the most researched form of child maltreatment.

In the present study, the increase in the level of awareness by 56.19 percent after counselling was significantly evident in the girl students who usually are considered to be at a greater risk of victimization and hence requires more stress to keep them well informed, counselled and educated about the risks they are prone to in the society they live in. In the study, it was observed that there was increase in the levels of knowledge after counselling and the children of the age group of 16 – 17 years had the maximum overall awareness both before and after counselling, but the impact of counselling was greatest on the 12 – 13 year age group. This shows that with increasing age, children tend to have a greater awareness about CSA, attaining knowledge over a period of time and, being of the pubertal age they have the curiosity to know more about sex and sexuality. Since the impact was greater on the group that had the lowest awareness (12-13 years) it implies that the earlier the age of children at which they are first counselled, the greater will be the impact on them, making them better equipped with the required information and safer in the long run.

In this study, there was an increase of 9.5 percent in the reporting of sexual abuse after counselling. There were no studies found that had similar rates of CSA. Queen Sofia Centre in 1997-1998 [6] analyzed the child protection files in Spain and found that prevalence of CSA was 3.6 % which means CSA is known to be under-reported problem. The reason behind such low reporting in the mentioned study was proposed to be reluctance to disclosing such information, thus pointing out to the importance of counselling in bringing out such information. In the present study 1.38 and 12.38 percent girls reported sexual abuse before and after counselling respectively. Counselling of children played the maximum role

in increasing the awareness of CSA among the children and it showed that there are no other proper sources from where children can gain the right information. Ideally, this should have come from the parents or counselling sessions by the schools, which is not the trend in our society right now.

In this study, 83.10 % were the male abusers and the female abusers were 16.90 % and this matches the analysis of the calls to Childline in London [7] where children talked about being sexually abused and wherein over two thirds of the perpetrators were males and only 6 % were females. In the present study sexual abuse by teachers was comparable with the study by Tang et al (2002), [65] but was not comparable to the study by Queen Sofia Centre (1997) that showed that the fathers and the step-fathers accounted for the largest proportion of persons responsible for sexual abuse, followed by mothers and uncles/aunts and was also not comparable to UNICEF (2005) [9] study covering Nepal that found that 18% of the perpetrators were the teachers. Similarly, The Immanent Frame (2016) [10] quoted that the most commonly reported perpetrators of sexual violence towards girls were the male family members followed by step fathers and the male friends of the family were also commonly named as perpetrators which also formed the major chunk in this study.

The historian Lynn Sacco in 1817-1889 [11] found more than 500 published newspaper reports of father-daughter incest between 1817 and 1889 which was very high compared to this study (only 1 case was reported) and this may be due to the conservative set up of our society which cannot accept the existence of such perverted acts, hence failing to report them.

In the present study, the modes of CSA in the descending order in girls included touching / being made to touch private parts / masturbation, being made to expose private parts, forcible kissing, showing of private parts, and sexual pictures / videos/stories each, insertion of private parts, oral sex, vaginal intercourse and anal intercourse but no nude photography. In this study, 80.95 percent abuse was of contact nature but non-penetrative, 14.29 % was of penetrative type and 4.76 % of non-contact CSA. Ajdukovic et al (2013) [12] stated that in each age group, the proportion of children who experienced non-contact sexual abuse was higher than of those who experienced contact sexual abuse, which was not so in the present study.

The immediate consequences and the outcome in the form of different feelings in the present study included shame, sadness, anxiety and poor academic performance, pain and health issues, discomfort, reduced self-esteem and this was comparable to the study by Goodyear –Brown et al (2012) [13] who observed that new problems in school such as difficulty in learning, poor concentration and declining grades could signify that something has happened to upset the child. Frequently long term effects included depression and self-destructive behaviour, anxiety, feelings of isolation and stigma, poor self-esteem, difficulty in trusting others, a tendency towards re-victimization, substance abuse and sexual maladjustment.

Conclusion

a. Girl child sexual abuse is a global phenomenon but going under-reported.
b. Councelling of the girl children at the appropriate time has a significant impact to sensitize them which not only increases their knowledge and awareness about the subject, but also corrects their misconceptions and encourages them to share their problem with rise in their confidence levels.
c. Counsellors can be of great help in making a difference not only in the attitude of children about CSA, but also in giving them enough courage to speak out.
d. Professional counsellors in the schools should be made mandatory and counselling for sexual abuse should be made compulsory

in all schools in the country.

e. Professional bodies like Indian Medical Association must sensitize its members towards the child victimization and play a pro-active role to address the problem.

Conflict of interest

None declared

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Original Research Article

Partial Hanging: Incidence and Problem

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Abstract

Not many studies have been done on partial hanging, since its incidence is less. Partial hanging often poses problem for law enforcement agencies because relation of victim believe it to be an incident of homicide and are often adamant to register a case of homicide. The present study was carried out between: Feb 2016 to Jan 2017. A total number of 2160 postmortem examination were conducted during this period. Of all the cases, Violent Asphyxial deaths contributed 7.4%. Hanging contributed 4.2% of total cases. Of 4.2% of cases, Complete Hanging contributed to 91.2%; Partial Hanging contributed to 8.8% of cases. Problem of Law and order can be dealt by empowering police.

Key words:
Apparent partial hanging; Suicidal hanging; Hanging

Introduction

In cases of partial hanging law and order problem in not uncommon. Near relations of the victim, as per grief reaction proposed by Elisabeth Kübler-Ross in her 1969 book On Death and Dying [1] are in denial mode. They think it to be an act of homicide. Seeing a part of the victim touching the ground or some support structure they cannot think it as a suicidal act. As seen in movies and as per believe system, suicide victims are normally shown as complete hanging , so it is not unusual to think it as an incident of homicide. They even try convince the police that the death being homicidal. Police also gets convinced in some cases till they get a rude shock from autopsy surgeon that the case was more in favor of suicidal hanging unless otherwise proved Hanging is a form of ligature strangulation in which the force applied to the neck is derived from a gravitational drag of the weight of the body or part of the body (2) In complete hanging whole body is suspended; no part of the body touches the ground. Partial hanging is a mode of hanging where any part of the body touches the ground; the body may be in kneeling, sitting, prone or supine position. In this case, the constriction force is formed by the weight of the head. In such cases, a certain amount of force to constrict the neck is quite sufficient for causing death. It is not necessary that the body has to be fully suspended in order to constrict the neck enough to cause asphyxia. (3). Partial hanging is taken to be diagnostic of being suicidal in nature (4). Hanging is the most popular method of suicide. Hanging has been employed as the method of suicide since time immemorial. Usually all hangings are suicidal. Accidental hangings are un-common and homicidal are rare.

Suicidal hangings are mainly due to financial loss, poverty, unemployment, physical and mental sufferings, love failure, unbearable pain and harassment for dowry.

Methods and Materials

a. Study was conducted in the Mortuary affiliated to the Medical College.
b. The study was carried out between: Feb, 2016 to Jan, 2017, a period of one year.
c. A total number of 2160 postmortem examination were conducted
d. Crime scene photographs and investigating officer's records were the source of study. Crime scene examination was done in a few cases.
e. Autopsies were conducted with enmasse removal of Thoracic and Abdominal Organs. Neck was last to be dissected after removal of the Cranial Structures.
f. External findings of the ligature mark were carefully noted and photographed.
g. Internal findings of the neck done: layer by layer dissection of the neck.
h. Statistical analysis of these cases of hangings were carried out: mainly in regards to violent asphyxia death, hanging and partial hanging.

Observations and Results

Table No 1. Percentage of violent Asphyxial deaths out total number of Post mortem done

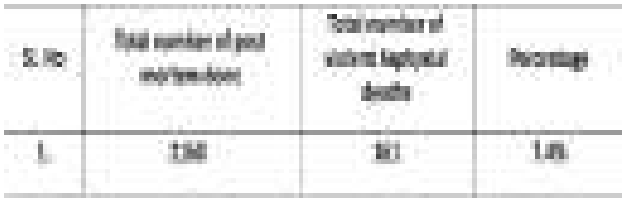

Table No 2. Number and Percentage of Hanging:

Sl. No	Asphyxial deaths	Number	Percentage
1.	Hanging	91	4.2%

Table No 3. Number of Complete and Partial Hangings:

Sl. No	Total number of cases	Total number of complete hanging	Total number of partial hanging
1.	91	83	8

Table No 4. Percentage of Complete and Partial Hangings:

Sl. No	Total number of cases	Percentage of complete hanging	Percentage of partial hanging
1.	91	91.2%	8.8%

Results:

a. Of total of 2160 autopsies were conducted in one year between February 2016 to January 2017 , violent asphyxial deaths contributed to 7.4% (n – 161) of cases.
b. Hanging contributed to 4.2% (n – 91) of cases.
c. Complete Hanging contributed to 91.2% (n – 83) of cases.
d. Partial Hanging contributed to 8.8% (n – 8) of cases.

Discussion

Polson CJ (5) cited experiments of many workers who opine that tension of 3 to 5 Kg is enough to obstruct jugular veins and carotid arteries and about 16 ½ to 30 Kg to obstruct vertebral arteries. While trachea closes by a tension of 15 Kg.

Khokhlov VD (6) modeled human body as a complex of 16 freely joined hard parts and calculated the tension exerted on ligature in different positions of incomplete hanging. He commented that in standing posture the ligature is stretched by more than 65% of the body weight, in kneeling position by 64-74%, in sitting by 17-32%, in recumbent posture by less than 18% of body weight.

Our observations closely matched with a study published in 2016; of the total 264 cases of self suspension, 88% of the hangings were complete and 12% were due to Partial Hanging [7]. It is to be noted, there is mild variation in both the results, though the study was carried at the same material time. The variation is mainly due to the geographical location, attitude of local population to frustration of life and determination to commit suicide.

The prime reasons for hanging used as suicidal method is

1. Easy availability of material
2. Minimum pain
3. Least time required
4. Almost 100% success in first attempt

Conclusion

There are many reasons to support partial hanging as diagnostic of suicidal deaths. Common arguments forwarded are: assailant will never leave the victim in position of partial hanging, since they want to be very sure about the death of victim, so they will ensure, victim is hanged properly in position of complete hanging. The other argument forwarded is by the time assailant manages to hang the dead body, the body would have started stiffening, so rigor mortis becomes an important impeding factor of partial hanging. Whatever the explanation forwarded, it remains a gospel truth that partial hanging is the surest sign of suicidal death.

As regards the problem of partial hanging, investing police personal can be empowered by educating them about partial hanging. By this they can avoid doubts of relations regarding partial hanging as homicidal killing. If this can be done by the investing agency from the very beginning, the problem would be nipped at bud before the public anger grows.

Conflict of interest

None declared

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Original Research Paper

Trends of Poisoning in Developing Country –A Ten-year Retrospective Study

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Abstract

Since year 2000 National Forensic Science Laboratory and year 2004 Central Police Forensic Science Laboratory had been analyzing the biological and body fluid samples derived from the bodies of people suspected to death due to poisoning. These samples were received from different districts of Nepal. The National Forensic Science Laboratory received 1659 cases for toxicological analysis during the years 2000 to 2012. Out of the 1659 cases, 723 cases were found positive for poisoning. The Central Police Forensic Science Laboratory received 9937 cases for toxicological analysis during the years 2004 to 2011. Out of the 9937 cases, 2266 cases were found positive for poisoning. The present study is one of the most important and useful studies of poisoning trend in developing country like Nepal. This study confined to poisoning trend in Nepal only and data presented accordingly. In poisoning trends study, organophosphorus poisoning was in majority which represented insecticidal poisoning exposure. During study at National Forensic Science Laboratory and Central Police Forensic Science Laboratory of Nepal, it was found that number of cases got negative results. After working on the same condition in both laboratories, it was found that negative results could be reducing by using of sophisticated techniques with increasing trained man power.

Keywords:
Forensic Toxicology, Poisoning, Medico legal, Organophosphate, Nepal

Introduction

Poison was discovered in ancient times, and was used by ancient tribes and civilizations as a hunting tool to quicken and ensure the death of their prey or enemies. This use of poison grew more advanced and many of these ancient people began forging weapons designed specifically for poison enhancement. Later in history, particularly at the time of the Roman Empire, one of the more prevalent uses was assassination. As early as 331 BC, poisonings executed at the dinner table or in drinks were reported, and the practice became a common occurrence. The use of fatal substances was seen among every social class; even the nobility would often use it to dispose of unwanted political or economic opponents.

The first comprehensive work on forensic toxicology was published by Mathieu Orifila(1813). His work emphasized the need for adequate proof of identification and the need for quality assurance. It also recognized the application of forensic toxicology in pharmaceutical, clinical, industrial and environmental fields.

In India, suicides resulting from pesticides ingestion are of special importance and may account for up to 80% of the total number of poisoning cases. The reasons for this incidence are partly socioeconomic factors and the availability of pesticides. These are not only used in agriculture but also to control pests domestically. The more prevalent pesticides are the organochlorine and organophosphorus compounds, followed by the carbamates and

phosphides, and there are a few cases in which other has been used. Since the 1970s pesticide poisoning has exceeded that from all other sources, including plants, metals and drugs (1).

During the 1970s pesticide deaths was caused mainly by dichloro diphenyl trichloroethane (DDT), gammaxene, aldrin, dieldrin, endrin, parathion, carbaryl, and zinc phosphide, with parathion and also endrin being the most widely used. In the 1980s other pesticides were also used and these included methyl parathion and related compounds, rogor, metasystox, demeton-O and -S methyl, propoxur. A number of those used during the 1970s and 1980s were replaced by newer pesticides in the 1990s including endosulfan, carbofuran, quinalphos, and aluminum phosphide and since then herbicides and fungicides have also been used.

It is found that organophosphate compounds are a diverse group of chemicals used in both domestic and industrial settings. Millions of people are exposed to danger by hazardous occupational practices and unsafe storage. However, it is deliberate self-poisoning that causes the great majority of deaths and puts immense strain on hospital services of developing nations, particularly in Asia (2).

Use of pesticides in Nepal was introduced about 1952 and its' use has been increasing over the years. It has been estimated that the use of pesticides in the developing countries approximately doubled every ten years between 1945 and 1995. There are around 50 common pesticides under 150 trade names available in the market. Several available pesticides are possibly carcinogenic to humans. Before the enactment of Pesticides Act, 1991 and Pesticides Regulations, 1993 that came into enforcement from 16 July 1994, there was no law regarding pesticides in the country. Benzene Hexachloride (BHC) dust is the most frequently sold chemical pesticide followed by Parathion methyl, Zinc phosphide, Aluminium phosphide, Malathion, Dithane, and Phorate. Worldwide estimates suggest that there are about three million (1,000,000 intentional and 2,000,000 unintentional) acute pesticide poisonings and approximately 220,000 deaths each year. Most of the poisonings and 99% of deaths occur in the developing countries. Most intentional pesticide poisonings are for suicidal or homicidal purposes, whereas, the most unintentional pesticide poisonings are accidental and occupational cases. Most of the reported cases of acute pesticide poisonings result from over exposure to organophosphorus compounds. In Nepal, most of the pesticide poisonings is intentional in nature. The most common insecticides used for suicidal attempt are organophosphorus compounds followed by zinc phosphide and aluminium phosphide. Familial conflict, failed love affair, failure in examination and business, financial problems are usually the common causes of suicidal poisoning. Accidental and occupational overexposure to pesticides occurs mainly among agriculture workers, farmers and their family members. A study on pesticide poisoning done by the World Health Organization in the SEARO (South East Asia Region Organization) countries revealed that among total of 258 cases of acute pesticide poisoning in Nepal, 91.5% were intentional cases followed by 6.2% occupational exposure cases and 1.16% accidental cases (3).

Materials and Methods

To know the trends of poisoning in Nepal, the work was carried out at National Forensic Science Laboratory, Lalitpur, Nepal and Central Police Forensic Science Laboratory, Maharajgunj, Nepal as well as various secondary and tertiary care hospitals in Nepal like Bir Hospital, Kathmandu, Tribhuvan University Teaching Hospital, Maharajgunj, etc. This was retrospective study of data of poisoning cases of last 10 years. The study was also conducted to know the methods and techniques used in poisoning cases for analytical purpose at Forensic Science Laboratories.

Results and Discussion

1. **Poisoning trend on the basis of Data from National Forensic Science Laboratory, Lalitpur, Nepal (A)**

Since year 2000 National Forensic Science Laboratory had been analyzing the biological and body fluid samples derived from the bodies of people suspected to death due to poisoning. These samples were received from different districts of Nepal. The laboratory received 1659 cases for toxicological analysis during the years 2000 to 2012. Out of the 1659 cases, 723 cases were found positive for poisoning.

In Table 1, the material for poisoning trends comprises of 1659 cases received for toxicological examination in the National Forensic Science Laboratory, Lalitpur, Nepal during the last decade (2000 to 2012). The data on the relevant factors were collected from reports regarding chemical analysis of viscera and other samples that were analyzed at the laboratory.Table 1 which represented data of poisoning cases at National Forensic Science Laboratory. From Table 1, it was cleared that organophosphorus insecticides were in majority from year 2000 to year 2012. This trend was from positive results of toxicology cases in Laboratory which was represented in Table 2 and Figure 1.

Table 3 and Figure 2 indicated that majority of cases were of organophosphorus poisoning and in 2003-2004 less number of organophosphorus insecticides cases were reported. From 2000-2012, phosphide cases was on second position amongst total reported poisoning cases. It was cleared that poisoning trends point to insecticide poisoning majority in which organophosphorus poisoning was high in number.

In present study, it was cleared that poisoning trends point to insecticide poisoning majority. In which organophosphorus poisoning was high in number and number of cases got negative results. It indicated that due to unavailability of proper techniques, method and infrastructure false or wrong results came. The same result reported in 1999 (4) in forensic and analytical toxicological cases and in 2014 in clinical toxicological cases in context of Nepal (5).

2. **Poisoning trend on the basis of Data from Central Police Forensic Science Laboratory, Maharajgunj, Kathmandu, Nepal (B)**

Since year 2004 Central Police Forensic Science Laboratory had been analyzing the biological and body fluid samples derived from the bodies of people suspected to death due to poisoning. These samples were received from different districts of Nepal. The laboratory received 9937 cases for toxicological analysis during the years 2004 to 2011. Out of the 9937 cases, 2266 cases were found positive for poisoning.

In Table 4, the material for poisoning trends comprises of 9937 cases received for toxicological examination in the Central Police Forensic Science Laboratory, Maharajgunj, Nepal from 2004 to 2010. The data on the relevant factors were collected from reports regarding chemical analysis of viscera and other samples that were analyzed at the laboratory.

Table 4 which represented data of poisoning cases at Central Police Forensic Science Laboratory. From Table 4, it was cleared that organophosphorus insecticides were in majority from year 2004 to year 2011. This trend was from positive results of toxicology cases in Laboratory which was represented in Table 5 and Figure 3.

Table 6 and Figure 4 indicated that majority of cases were of organophosphorus poisoning and in 2004-2005 less number of organophosphorus insecticides cases were reported.

From 2004-2011, organochlorine insecticides cases were on second position

amongst total reported poisoning cases. It was cleared that poisoning trends point to insecticide poisoning majority in which organo-phosphorus poisoning was high in number.

Above tables represented data of poisoning cases at National Forensic Science Laboratory and Central Police Forensic Science Laboratory, Nepal. From above data, it was cleared that organophosphorus insecticides were in majority from year 2002 to year 2012. This trend was from positive results of toxicology cases in Laboratory which was represented in Table 2, Figure 1, Table 5 and Figure 3.

It is indicated that majority of cases was of organophosphorus poisoning from 2005-2011 and from year 2000-2005 less number of organophosphorus insecticides cases were reported. Other trends of poisoning were organochlorine insecticide, mixture of organophosphorus and pyrethroids and phosphide cases amongst total reported poisoning cases.

In present study, it was cleared that poisoning trends point to insecticide poisoning majority. In which organophosphorus poisoning was high in number and number of cases got negative results. It indicated that due to unavailability of proper techniques, method and infrastructure false or wrong results came. The same result reported in 1999 (4) in forensic and analytical toxicological cases and in 2014 in clinical toxicological cases in context of Nepal (5).

While comparing the pattern of poison observed in this study with poison data publication of India, Sri Lanka, and Bangladesh, it was found consistent nature of increasing trends of Pesticide poisoning in all those countries. A mixture of insecticide (Chlorpyrifos and Cypermethrin) is found as a new emerging uses in this study while in those countries it was not found reported. In this study it was found that the first commonly used poison is organophosphorus (OP) insecticide followed by second Drugs (Benzodiazepines) and third rat poison (Al/Zn phosphide). The first commonly used poison was found similar in those countries also but second and third commonly used poison is found different. Indian publication (6) reported that the second and third commonly used poisons are rat poison (Aluminium phosphide) and Benzodiazepam drugs. The Sri Lankan publication (7) reported oleander plant poison as well as washing detergent (oxalic acid and potassium permanganate) and paracetamol overdose as second and third commonly used poisons. The Bangladeshi publication (8-9) reported poisoning with unknown substance and copper sulphate as well as sedative drugs is second and third leading cause of poisoning. Recently, in Bangladesh the trends of poisoning used have been changed pesticides to transport related poisoning (food with mixed Benzodiazepines preparations).

Conclusion

The present study is one of the most important and useful studies of poisoning trend in developing country like Nepal. This study confined to poisoning trend in Nepal only and data presented accordingly. In poisoning trends study, organophosphorus poisoning was in majority which represented insecticidal poisoning exposure. During study at National Forensic Science Laboratory and Central Police Forensic Science Laboratory of Nepal, it was found that number of cases got negative results. After working on the same condition in both laboratories, it was found that negative results could be reducing by using of sophisticated techniques with increasing trained man power.

Conflict of interest

None declared

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Original Research Article

Profile of Fatal Electric Current Injury Cases

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Abstract

This paper reviews the circumstances of 40 fatalities from electrical injuries brought for autopsy. 95% were accidental. 65% of the cases were from rural background. 92.5% of the deceased were males. Most of the fatalities were in the age group of 20-29 years (375%) followed by 30-39 years (27.5%). Laborers were the commonest victims followed by service personnel. 92.5% of the deaths occurred within the first half hour of the incident. The incidents peaked around July. The body parts included left upper limb, right upper limb and chest/abdomen in decreasing involvement and distribution. A comparison has been made with studies from other states and countries.

Keywords
Autopsy, Burns, Death, Electricity, Lightening, Suicide, Torture

Introduction

Prior to Edison's development of electric lamp in 1879, electric shock except from lightning was a rare phenomenon because there were very few electrical devices available which could provide a shock.1 First human fatality from accidental electrocution was reported in 1879 in Lyon, France. With the advancement in technology, the use of electricity is increasing day by day; at the same time, disasters do occur.2 The term "electrocution," was coined in 1889 by US newspapers just before the first use of the electric chair in 1890, originally referred only to 'electrical execution'.

There are two types of electric current direct current and alternating current. Fatalities occur mostly with alternating current. The domestic, industrial or agricultural supply is of alternating current. In India, electricity is transmitted from generating system via transformers so as to prevent power theft and wastage of electricity.3

Death occurs mostly at a voltage between 110-380 Volts and at 50 Hertz frequency, which is the voltage range of domestic, industrial and agricultural electricity. Low tension of 50V or under rarely causes death. Sources of fatal electrocution include domestic sources, industrial commercial centers & transport system and lightning.4 Deaths due to electrocution are not too uncommon, given the widespread use of electricity for commercial, industrial, public and domestic purposes, the number of deaths are very less.4

The occurrence of injuries caused by contact with electrical conductors depends upon

kind or type of circuit, duration, resistance of tissues, voltage, amperage and pathway of current.–5,6 Electrical burns are classified into four different types as direct contact leading to electrothermal heating, and indirect contact leading to Arc, Flame and Flash.–6

During adolescence, a more active exploration of the environment leads to more severe high-voltage injuries or death. At the time of presentation, documentation of injuries is important not only for the immediate resuscitation of the victim but also for medicolegal reasons.–6 The electric current is fairly resistant to postmortem decomposition and can be demonstrable for a considerable time on a buried corpse.7 It is well to keep in mind that lightning can be used to disguise a murder carried out by other methods.8

Material and Methods

The present study was conducted on 40 dead bodies brought to the mortuary, of a tertiary care institution, with history of death due to electric shock over a period of two years. All the cases were thoroughly examined for medicolegal purposes at the time of conducting postmortem examination and findings were recorded. Skin was examined for the wound of entry and exit (if any) of electric current.

Observations

The study was carried out on 40 dead bodies brought for medicolegal autopsies in the Department of Forensic Medicine and Toxicology, Govt. Medical College, Amritsar alleged to have died of electric shock and on 20 control cases on the corpse dying from the causes other than the electric current injuries.

In the present study conducted from over a period of one year, 1748 cases were brought to the mortuary. Of these, 40 cases were brought by the police with the alleged cause of death to be electric shock. Incidence of electric shock was 2.2% of total autopsies.

Table 1 shows age and sex wise distribution of deaths due to electric shock and comparative study on control cases where cause of deaths was other than electric current injury and electric current was given to such corpse for different durations and at different site of the dead body. Maximum number of victims of electric shock was in the age group of 20-29 years which were 14 (35%) and least number of deaths was in the extreme of age group studies as per table 1. Youngest person that died was of the age of 2 years and the eldest was of about 62 years of age.

The male victims were 37 (92.5%) out of which 13 (32.5%) were in the age group of 20-29 years and 11(27.5%) were in the age group of 30-39 years. The female were 3 (7.5%), i.e. youngest one was two years and eldest one was in the age group of 50-59 years. Male female ratio was 9.2:0.8.

Table 2 shows rural/urban distribution of person who died due to electric shock and their comparative study with control cases. Out of forty cases, 26 (65%) were from rural areas and 12 (30%) from urban localities. 2 (5%) cases were unknown in the present study whose origin whether rural or urban, could not be ascertained.

Table 3 shows the alleged manner of death in electric shock. It was observed that none got electric current injury by intention of suicide, while 38 (95%) cases got electric shock accidentally. Two cases (5%) died due to associated injuries. No case of homicide electric current injuries was there as is evident from the table 3.

Table 4 shows occupation of victims of electric shock. In the present study, maximum deaths 19 (47.5%) were from Labor class which included 12 (25.2%) daily wagers 5 (10.5%) were factory workers, 1 (2.1%) each were domestic servant and rickshaw-puller. In this study 2 (5%) of the cases were of children up to 14 years of age, 1(2.5%) was a housewife and of 3 (7.5%) person occupation could not be known.

Table 5 shows the time interval between the electric current and death of the victim. 37 (92.5%) of the total cases under study died within 30 minutes of the electric current injury. 2 (5%) of

the cases died within 6 hours of the electric current injury while 1 (2.5%) case died within 12 hours. This one case dying within 12 hours was from the associated injuries got after the fall from electric pole even though, alleged cause according to police information, was death due to electric shock.

Table 6 shows the time interval between the death and postmortem examination of the deceased of electric shock. 26 (65%) of the victims were subjected to post mortem examination within +12-24 hours and post mortem interval of 1 (2.5%) case was +6-12 hours. It was also observed that the maximum number i.e. 29 (72.5%) of the victims were subjected to post

Table 1. Age and sex wise distribution of deaths due to electric shock

Age in years	Male		Female		Total	
	n	%	n	%	n	%
0-9	-	-	1	2.5	1	2.5
10-19	3	7.5	-	-	3	7.5
20-29	13	32.5	1	2.5	14	35.0
30-39	11	27.5	-	-	11	27.5
40-49	6	15.0	-	-	6	15.0
50-59	3	7.5	1	2.5	4	10.0
60-69	1	2.5	-	-	1	2.5
Total	37	92.5	3	7.5	40	100.0

Table 2. Rural/urban distribution of person died of electric shock

Area of Incidence	Male		Female		Total	
	n	%	n	%	n	%
Rural	24	60.0	2	5.0	26	65.0
Urban	11	27.5	1	2.5	12	30.0
Unknown	13	32.5	1	2.5	14	35.0

Table 3. Alleged manner of death

Alleged manner of death	Male		Female		Total	
	n	%	n	%	n	%
Suicidal	-	-	-	-	-	-
Accidental	35	86.5	3	7.5	38	95.0
Associated trauma due to accidental electric shock	2	5.0	-	-	2	5.0

Table 4. Occupation of victims of electric shock

Occupation	Male		Female		Total	
	n	%	n	%	n	%
Children (1-14years)	1	2.5	1	2.5	2	5.0
Laborers	19	47.5	-	-	19	47.5
Farming	4	10.0	-	-	4	10.0
Inservice	10	25.0	1	2.5	11	27.5
Business	-	-	-	-	-	-
Housewives	-	-	1	2.5	1	2.5
Non known	3	7.5	-	-	3	7.5
Total	37	92.5	3	7.5	40	100.0

Table 5. Time interval between current injury and death (as per police information)

Period	n	%
0-30 minutes	37*	92.5
Within 6 hours	2	5.0
Within 6-12 hours	1	2.5

*37 cases included 2 cases of deaths due to lightning

Table 6. Post mortem interval of victims of electrocution

Time in hours	n	%
0-6	2	5.0
6-12	1	2.5
12-24	26	65.0
24-36	9	22.5
36-48	2	5.0

Table 7. Month wise distribution of electric current fatalities

Month	n	%
January	-	-
February	1	2.5
March	1	2.5
April	5	12.5
May	3	7.5
June	5	12.5
July	9	22.5
August	4	10.0
September	7	17.5
October	2	5.0
November	2	5.0
December	1	2.5

Table 8. Distribution of electric burn injury on different body parts

Site	n	%
Face, head and neck	6	15.0
Right upper limb	20	50.0
Left upper limb	24	60.0
Chest and abdomen	18	45.0
Right lower limb	10	25.0
Left lower limb	9	22.5
No current mark	6	15.0

Table 9. Comparison of the findings with other studies

Study	Autopsy %	M:F	Age	Area	Season	Route of entry	Survival period	Manner of death
Current study Amritsar, India	2.2	12.3	20-29 (35%)	Rural 65%	Summer	Upper limbs 52%	<30min 92%	Accidental 100%
Patiala, India[12]	0.9	10.2	31-40 (22%)	Farm 49%	Summer 55%	Upper limbs 66%	<1hour 37%	Accidental 100%
Diyarbakir, Turkey[13]	3.3	2.3	0-10 (31%)	Home 45%	Summer 38%	Upper limbs 48%	Brought dead 82%	Accidental
Belfast, UK[14]	-	18.6	21-30 (22%)	Workplace 58%	Summer 33%	-	-	Accidental 84%
Tehran, Iran[15]	0.6	28.4	21-30 (44%)	Workplace 64%	Summer 40%	Upper limbs 66%	<1hour 92%	Accidental 96%
Delhi, India[4]	1.6	5.7	20-29 (50%)	-	-	Upper limbs 52%	Immediate 92%	Accidental
Delhi, India[9]	2.0	All males	20-29 (44%)	-	Summer 50%	-	Immediate 89%	Accidental 100%
Delhi, India[16]	1.98	9.2	21-30 (41%)	Home 65%	Summer 62%	Upper limbs 59%	<1hour 98%	Accidental 99%
Varna, Bulgaria[17]	-	2.8	25- 44 (32%)	Home 78%	Summer 66%	-	-	Accidental
Coimbatore, India[18]	-	9.7	21-30 (48%)	Home 62%	Summer 42%	Upper limbs 52%	<1hour 88%	Accidental 100%
Loni, India[19]	2.3	3.8	21-30 (30%)	Non-domestic 66%	Summer 49%	Upper limbs 75%	Brought dead 94%	Accidental 100%

Discussion

The fatalities due to electric current injuries, although less, cannot be overlooked. The fatalities/accidents are likely to increase day by day due to spurt in use of electrical gadgets in our daily life. Increased use of electrical appliances means, enhanced electrical supply and both of them can be responsible for electrical mishaps in the form of accidents either due to the man power involved in the maintenance of the electricity supply or repair of electrical gadgets all this can lead to electric current injuries or even accidental deaths.

The present study comprised 40

medicolegal autopsies brought to mortuary wing of the Department of Forensic Medicine and Toxicology who were the victims of electric shock. The observations of the present study are discussed with the findings of the previous studies carried out by various authors as per table 13.

In the present study, the incidence of electric shock was 2.2% of total autopsies, which though less, yet cannot be ignored. Murty et al (1997)4 observed that the incidence to be 1.6% and by Aggarwal et at (1997)9 to be 2%. The present study shows similar results with their studies.

Age distribution

In the present study, the majority of the deceased of electric shock were in the age group of 20-29 years (35%), as is evident from Table 1 The studies carried out by Murty et at (1997)4 and Aggarwal et al (1997)9 also indicated this age group most vulnerable to electric current trauma/deaths as is evident from their figures of 50% and 44.09% respectively. The higher percentage of victims in this age group in their studies is perhaps because of the fact that their studies were exclusively carried out in Delhi, where people have better electricity facilities. The other factor can be that ours is a nearly two years study whereas their study is an epidemiological study extending to 8 years and 3 years respectively.

The question of why this age group is commonly involved in electric current fatalities, is possibly because of the fact that young one are more enthusiastic and don't shirk to fondle with the electric appliances/supply lines or are relatively less fearful in comparison to other age groups.

Sex distribution

The present study shows that male victims were 92.5% of the cases studied as shown in table 1. The study by Murty et al (1997)4 observed males to be affected 85.03% while Aggarwal et al (1997)9 observed that 100% cases affected were males. In our opinion the males are more prone to get electric shock due to the fact that they are more involved in outdoor activities and working as laborers or doing maintenance work on electric poles as compared to female sex.

Rural/Urban distribution

The present study shows that 65% of the cases were from rural areas as per table 2 indicating that they are more prone to get electric shock which can be because of illiteracy and carelessness while handling electrical equipment. The other authors have not studied this aspect at all.

Alleged manner of death

In the present study as per table 3, 100% cases studied died due to accidental electrical trauma. Study by Aggarwal et al (1997)9 showed 100% deaths due to electrocution were of accidental origin. But study by Murty et al (1997)4 noticed that the majority of the deaths were accidental whereas one case was of suicide which may be due to the fact of longer span of study i.e. 8 year study.

Occupation of victims of electric shock

In the present study, 47.5% victims were laborers as is evident from Table 4. It shows that laborers are more prone to get electric shock as compared to person from other occupation due to the fact that most of the times, they are uneducated and may know little about hazards of electric shock while dealing with electrical repair and thereby being careless (Photo 3), are more prone to electric current trauma. Murty et al (1997)4 never studied the specifically the occupation of the individual but have quoted the circumstances leading to the electric current deaths. Aggarwal et al (1997)9 not at all studied the occupational aspect of these fatalities. Hence no concrete comparison can be drawn in context to their studies.

Time elapsed between electric shock and death of the victim

In the present study, 92.5% of the victims died immediately as is clear from Table 5 after getting electric shock. Murty et al (1997)4 observed that 90.6% of the cases of electric shock died immediately and Aggarwal et al (1997)9 observed that 88.9% died on the spot. The present study shows similar results as shown by Murty et al (1997)4 and Aggarwal et al (1997)9. All these studies including the present study indicates

clearly how fatal the electric current trauma can be that there is least chance of giving treatment to such a victim, as such needs a great caution while at work with electricity and its appliances.

Post mortem interval

The present study shows that 72.5% of the fatalities of electric shock were subjected to post mortem examination within first 24 hours as is shown in Table 6. Even if this study has got no relevance with the electric current trauma and perhaps that is the reason that no other author has any mention to this aspect of the study. We specifically studied it with the view that since it is clearly mentioned in the literature that electric current injury can be detected even if considerable period has lapsed since the electrical injury or even if the putrefaction has set in yet, it can be made out that this case has died due to electric current injury, even though, in the present study we never came across any such case.7

Month wise distribution of electric current fatalities

In the present study of 40 cases, maximum deaths were reported in July which was 22.5% according to Table 7. As per the study by Murty et al (1997)4 and Aggarwal et at (1997)9 deaths in July were 3.2% and 50% respectively. This variation can be because of the fact that area under present study is agriculture based area and more people of the area under present study are doing labor work. Perhaps this makes variation in the study.

Distribution of electric burns

The present study shows that in 60% of the cases, upper extremities were affected (Table 8) with the electric current injuries, which is similar other studies. Studies by Murty et at (1997)4 observed the involvement of upper extremities in 51.9% of cases. The observations of the studies and comparison shows that upper extremities of the body bore main brunt of electric current trauma.

The peculiar observation of no current mark on the body of person, who died in bath tubs because of electric shock, is similar to the studies conducted by Koeppen et at (1962).10 This gives rise to inkling to the observation of Pounder (1999)11, that sophisticated method of torture without leaving any physical evidence of electric current trauma is by passing the electric current through wet clothes or on the wet surface of the body as observed by us, is perhaps the newer method of torture developed by the torturers.

Conclusions

Many of the electrocutions are readily preventable. Everyone must promote electrical safety in the home and at workplace. Despite the readily available supply of electricity, suicidal electrocutions remain relatively rare. Most of the studies highlight the need to educate the farmers at their workplace regarding the proper use and maintenance of electrical equipment and the safety measures to be taken while handling them. It must be ensured that electrical infrastructure meets the standards and public awareness of electrical safety measures is disseminated.

Photo 1. Showing crater like contact burn on hand

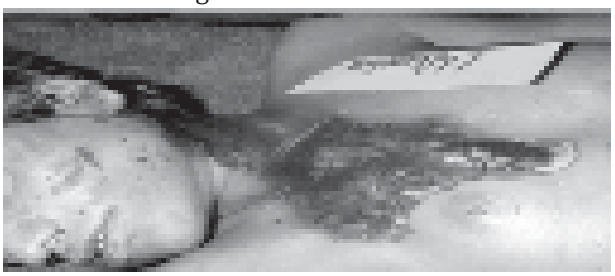

Photo 2. Showing flash burns on chest and neck

Photo 3. Showing victim still holding to his pliers

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Original Research Article

Effect of Inhibitors on the Blood taken from Earthy Surfaces and D.N.A. Profiling in Forensic Cases

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Abstract:
Forensic samples received in Forensic laboratories are generally collected by the police officers in unscientific manner. Blood pool or stains, found on crime scene are collected on the cotton swabs or on gauze cloth pieces and without further drying them, are kept in plastic container which leads to degradation. In most of the cases, pieces of cemented or earthy material having blood stains are sent to the Lab for further examination. Advance technologies in DNA profiling (STR analysis) may help to identify the criminals even in case the quantity of biological material is very low but improper preservation reduce the chance of DNA amplification in such cases due to damp nature and presence of soil. In criminal cases like murder or physical assault, DNA profiling may help in identification of crime scene location and transfer of biological materials from accused to victim or vice versa. In such type of cases, the result can be concluded on the basis of DNA profiles generated from different samples collected from victim, accused and the scene of offence. Due to improper preservation and other environmental factors, forensic samples collected from soil, may undergo degradation or may possess some PCR inhibitors which affect PCR and ultimately, DNA profiling. These inhibitors are obstacles for successful DNA analysis especially from the blood lifted from the earthy surfaces. STR profiles generated from such degraded or contaminated samples, usually contains PCR artefacts such as Allelic-drop, multi-peak or partial profiles etc. In this study we have taken 30 samples each from different surfaces from the period of 6 months to 3 years, these are 'Cotton wrapped in blood and soil', 'lumps of Blood stained soil', 'blood from the wall plaster', 'blood stained cemented floor pieces' and 'blood stained black road concrete'. Samples, collected in the form of swabs or the piece of earthy materials by the police officials or forensic Expert were sent to the laboratory. Allelic drop or complete failure of DNA profile was seen from the samples like 'Cotton wrapped in blood and soil' & 'lumps of Blood stained soil', due to sample-degradation and inhibitors present in the soil. This study concludes that better DNA quantity has been found from the samples in which soil particles were less and from those samples, complete DNA profile was generated.

Keywords:
Forensic sample, blood pool, DNA profiling, physical assault, PCR inhibitors

Introduction

The goal of forensic scientist is to assist the investigation agencies and ultimately, help the judicial system. The cases sent by the police to the Forensic lab with the query of DNA analysis, includes murder, mass disaster, accident, concealment of identity of individual/fragmented body parts or the cases in which body is transferred after murder from one place to another. In outdoor homicide or other heinous crime such as rape, biological material is transferred from victim to accused or vice versa and also on the surroundings, i.e. soil (1). Legally, the place of offence must be fixed by the investigation agencies (2). In a particular case where blood is found on the place of incident, can be individualised by the DNA profile (as it is unique for every individual) and thus the individual can be tracked further or the suspect can be exonerated. Usually, Investigative officer asks for the help of the forensic scientist in linking the accused with the place of offence, on the basis of biological evidences collected by them from the spot. But it becomes a challenge for the forensic scientist if the biological evidence lifted from the spot, is contaminated or preserved badly, due to improper handling of samples during collection such as blood stained soil or taking the cotton swab mixed with soil and then keeping them (blood sample along with soil particles) in a plastic container that ultimately leads to degradation of the sample. Environmental condition can degrade the blood mixed with soil or on cemented materials if the sample collection is not proper. Degradation starts with autolysis followed by bacterial destruction of cells. Sometimes degradation is up to a level that DNA becomes unrecoverable (3). Soil humus or Humic Acid having large number of hydroxyl and

carboxyl groups simulates the phosphate group of nucleic acid and subsequently interfere with the PCR process (4). It becomes important to remove humic acid from the nucleic acid extracts before the amplification of DNA, extracted from soil or sediment samples, as it (humic acid) get concentrated during the process & therefore act as PCR inhibitor (5). Quantity of humic acid depends on types of soil. Sandy soil has less concentration of humic acid (≈0.5mg/g) while fertilized soil or clay has more humic acid (≈25mg/g) (6). In some of cases, the forensic experts are called up by the Investigation Officer on the crime scene, to lift all the possible evidences in proper way. Blood or other biological material has to be lifted in such a manner that contamination with inhibitors during sample-collection should be avoided. In the cases, where blood stains are found on wall plaster and if, it would be impossible to take the intact spot from the wall then the blood stain is taken on sterile saline-damp gauze. DNA analysis becomes more complicated when examination of such samples is done after few months or years from sample collection due to heavy pendency of cases. In this study we have analysed the samples from 6 months to 3 years of the collection.

With the advancement in current technologies, DNA analysing methodology has improved a lot. The sensitive Real time PCR and PCR has enabled forensic scientists to analyse any biological sample, including blood, saliva, semen, hair etc., even in small quantity, and help in linking or exonerating the suspect with the crime scene spot. Q-PCR is a remarkable technique which is used to analyse forensic samples. This technique helps in qualitative, quantitative analysis of DNA and also marks the presence of inhibitors in the samples (7). DNA quantitation of forensic sample is very important part of DNA analysis as we may know how much DNA is there and how much we have to use for conventional PCR as proper amount of amplicon concentration is required for complete DNA profiling, otherwise split peaks, false peaks or off ladder alleles will be seen in the profile. Inhibitors in the sample may directly bind to DNA or interact with DNA polymerases (eg. Taq polymerase), as they are sensitive to various inhibitors and thus, amplification process is obliterated (8). The best way to avoid PCR inhibition is by preventing inhibitors from being processed along with the samples. The use of magnetic beads is the best way for analyzing such samples. Direct use of degraded samples may affect the autosomal STR analysis resulting in unsuccessful or partial DNA profile and may cause false-negative results (9); therefore, it is necessary to do the RT-PCR prior to go for PCR.

The microsatellites used for human DNA profiling have 4 to 5 nucleotides repeats as 2 nucleotides may cause STR stutter. The quantity and quality of extracted DNA affects the success of its analysis and the overall quality of the final DNA profiling. Low quantity of extracted DNA may result in the amplification of a suboptimal input amount of alleles, leading to imbalance in size of heterozygous peak heights and further allelic drop of large sized markers. The failure to remove inhibitors during the extraction process may result in poor amplification of certain big sized marker or the failure to generate the full and accurate DNA profile or generate false-negative results. In this study, we have used different types of samples including 'Cotton wrapped in blood and soil', 'lumps of Blood stained soil', 'blood from the wall plaster', 'blood stained cemented floor pieces' and 'blood stained black road concrete'. The Quantifiler Duo kit of Applied Biosystems was used to know the quality & quantity, PCR inhibitors and availability of male DNA in the samples. This method helped to know the quantity of DNA and also the level of degradation in examined forensic samples (10). A comparative study has been performed using organic extraction method, to evaluate the quality and quantity of the extracted DNA using RT-PCR method.

Materials & Methods

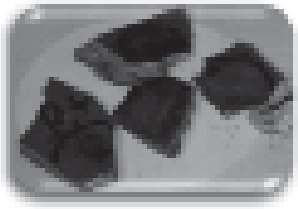
A. Sample Preparation and Processing

Samples lifted by the Investigation officers in unscientific manner may reduce the chance of proper DNA extraction from the gauze or swab prepared by them. They, while collecting biological material from crime scene take intact lumps of soil portion having blood, instead of preparing cotton swab from the blood-stained soil as it becomes difficult to extract DNA when the exhibits are contaminated with soil. In the laboratory for the proper examination, blood was lifted with the help of gauze cloth after wetting it in normal saline from the 'lumps of blood stained soil', 'blood stained cemented floor pieces', 'blood stained black road concrete' and dried in incubator at 40 degrees for 2 to 4 hrs, prior to taking for isolation to avoid contamination. However, the exhibits 'Cotton wrapped in blood and soil' and 'blood from the wall plaster' (already been lifted by the forensic expert or police officer from the spot) were taken directly for the examination. All the samples were processed by organic extraction method. The samples failed to generate quantity of DNA in Real Time PCR were processed through the Auto mate kit of applied Biosystem as per manufacturer protocol. The blood stained area 2 x 2 cm^2 of gauze cloth piece taken for examination was to equate the quantity of sample's material for DNA analysis. Each sample for examination was prepared separately using sterile & disposable tools.

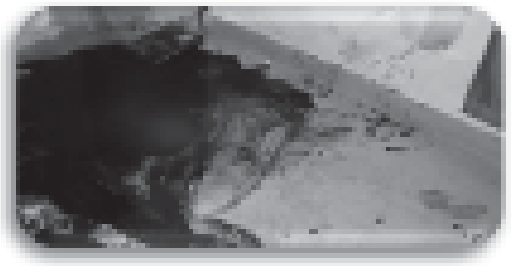
B. DNA Extraction & Quantitation.

The method applied for DNA isolation was Phenol Chloroform Extraction. In this method buffered tris-phenol used as a solvent to separate DNA from proteins and cell debris (11). The 2 x 2 cm2 area of 'Cotton wrapped in blood and soil', gauze prepared from 'blood from the wall plaster' and blood stained gauze cloth pieces prepared from the forensic exhibits i.e. 'lumps of blood stained soil', 'blood stained cemented floor pieces'& 'blood stained black road concrete' were cut into small pieces and taken in 1.5 ml tubes. Direct lysis method is believed to cause DNA shearing and fails to remove the impurities like humic acid. Therefore, extra purifications process was needed, which might yield less DNA. Each sample which had more soil content such as in Cotton wrapped in blood and soil, lumps of blood stained soil were mixed with normal saline and incubated at 600 C for 3 hrs. The soil solution was transferred into elution micro-tubes having filter membrane and column tube attached to it. The sample lysate in elution micro-tubes was filtered by centrifuging @ 10,000 rpm. The process filtered most of the soil particles from sample lysate, which got transferred into the column tube of elution micro-tubes. This sample lysate was transferred in normal 1.5 ml tubes. 500 µl Forensic buffer, 40 µl SDS 20% and 25 µl PK was added in each of the tubes having small pieces of gauzes and sample lysate and kept overnight at 37^0C in thermo shaker for incubation. Next day, general method for organic extraction was used having Phenol, chloroform & Iso-amyl alcohol. Sodium acetate and iso propanol was used to precipitate the DNA and pellet was formed. DNA pellet was washed two times by 70 % alcohol and last washing was done by 100% alcohol. Lastly, DNA was dissolved in 40 µl TE (12).

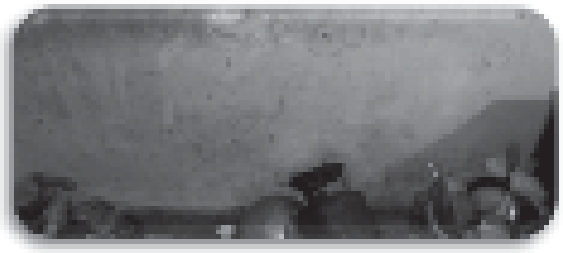
After isolation, DNA concentration of each sample was determined by using Quantifiler® Duo Quantification kit (Applied Bio systems) with 7500 Real Time PCR machine according to the manufacturer's protocols. Quantification Standards were used to determine the DNA quantity in each sample. The kit used, contains three different types of components, namely Taq Man® (which act as probe for human specific ribonuclease RNA component H1 (RPPH1) gene), human male specific Sex-determining region Y (SRY) gene and an Internal Positive Control (IPC) (7).



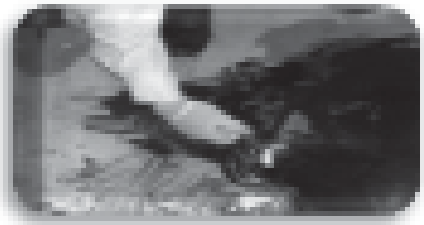
Cemented Floor Pieces



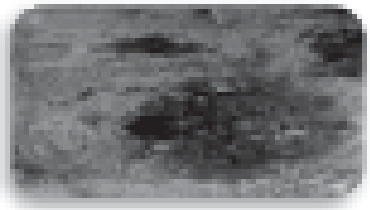
Blood Pool on smooth surface



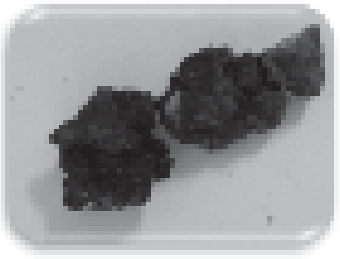
Blood stains on Wall Plaster



Lifting blood on cotton swab from pool

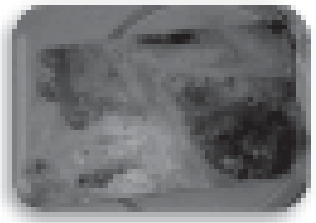


Blood on Muddy Surface

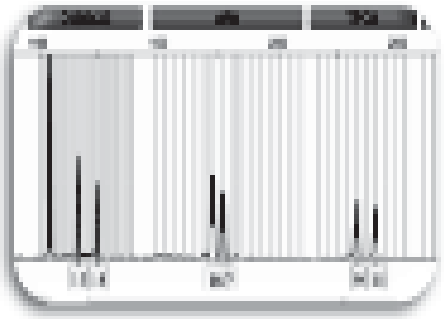


Black road concrete Pieces having Blood

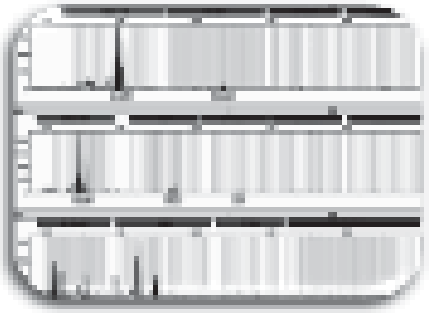
Cotton wrapped in blood and soil



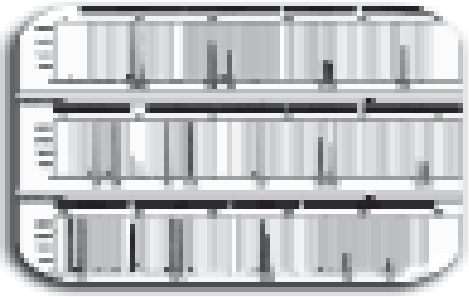
Cemented floor pieces having Blood



Split-peak Profile and false peak



Profile with Allele-drop out



Complete STR Profile

Results & Observations

Table 1 shows the Quantity of DNA (‟ g/µl) obtained from different samples on 7500 Real Time PCR machine and accordingly, percentage of success rate that is being observed from the data.

Pie-chart showing Success Rate % obtained from different samples is also given below.

All samples were potentially challenging for examination. The highest quantity observed from extracted DNA was from 'blood stained cemented floor pieces' (94.90 ‟ g/µl) while lowest quantity observed from 'Cotton wrapped in blood and soil' was 0.01 ‟ g/µl. It was noticed that the quality and quantity of DNA affect the peaks height in the profiles. Samples from 'blood stained cemented floor pieces', 'blood from the wall plaster' and 'blood stained black road concrete' had produced complete, balanced STR profiles that were devoid of any PCR artefacts and had peak height equivalent to input amount, demonstrating that removal of inhibitor was effective in isolating high-quality genomic DNA with some exceptions. While from the exhibits 'Cotton wrapped in blood and soil' and 'lumps of blood stained soil', all the possible artefacts including allelic drop-out in big sized markers and, multi-peak, Split-peaks and false-peak profiles were observed, due to presence of higher level of PCR inhibitors such as humic acid or contamination and degradation.

Discussion

The probability of isolating good quality and quantity of DNA in delayed examination cases is increased when blood samples were lifted on damped gauze cloth piece from normal saline (0.85%) as it is optimized and validated procedure and samples can be preserved for longer time periods. In the cases where investigative officer had collected the samples himself without taking any precautions, on cotton swabs alongwith mixed portion of the soil, then there would be very little chance of generating a good profile from such samples. The DNA extraction procedure was opted in such a way, that the inhibitors and other contaminants might be prevented from being processed with samples. Usually, delay in examination and improper preservation reduces the DNA quantity.

As it was cited by M.S. Shahzad et. al. that quantity and quality of DNA reduces prominently with time due to exposure of samples to natural environment and causes DNA degradation. Locus and allele drop-out were observed in the profiles from samples which were processed after 20th and 30th day (14). While in this study, the samples were examined years after collection and allelic drop-out, multi-peak, Split-peaks and false-peak profiles were observed with minimum success rate of quantization, from 'Cotton wrapped in blood and soil' and 'lumps of blood stained soil' samples. The yield of DNA was significantly higher from blood stained gauze cloth pieces that were prepared from the 'blood stained cemented floor pieces' and 'blood stained black road concrete', followed by 'blood from the wall plaster' while 'lumps of blood stained soil' & 'Cotton wrapped in blood and soil' had given the lowest value in RT-PCR and worst in damp samples. This implies that the yield of DNA was significantly higher from the samples which had less soil particles, however very low or nil quantity of DNA was found where the soil particles were more in the samples.

This has been observed that if blood had been lifted from the lumps of soil during evidence collection, rather than lifting the whole lump of soil and sent for examination, then there would be higher chance of getting better DNA quantity and complete DNA profiles.

Conclusion

Blood stained earthy surfaces are of great interest for investigative agencies, as they may provide DNA profiles, which further help in investigation by giving the identity to examined exhibits. Extraction of DNA from earthy surfaces often remains a challenge for the forensic scientists, due to presence of contaminants and PCR-inhibitors (say, humic acid) in the samples. DNA extracted from different earthy surfaces showed remarkable variations in the yield as well as in the STR profiles. Profiles having multi-peaks on small sized marker (with the size of less than 200 base pairs), Allelic drop-out and partial profiles were generated from the source of

exhibits having higher soil content and degradation, for e.g. 'Cotton wrapped in blood and soil' & 'lumps of blood stained soil', only few such samples were able to give sufficient quantity that can generate complete STR Profile. Such samples were then further processed by amplifying the big sized markers, by using the Minifiler kit which is expensive as well as time consuming process.

At last but not least, it is concluded that the presence of soil in the samples have given minimum amount of DNA and only some of the samples were able to generate the complete profile. Therefore, for DNA examination it is very important to obtain appropriate quality & quantity of DNA for accurate profile which is possible only in the case where samples have minimal amount of inhibitors or contamination. The chances of DNA amplification will reduce if the sample is damply prereserved.

Conflict of interest

None declareed

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Comparative chart showing total DNA yield in ? g/µl obtained from different samples

Pie-chart showing Success Rate % obtained from different samples

Update Article

Recent Advances in Management of Aluminium Phosphide Poisoning

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Abstract

Aluminium phosphide (AlP), commonly known as celphos is a household name in villages of Punjab. This cheap solid fumigant and a highly toxic pesticide is commonly used for grain preservation. The post "green revolution" era saw alarmingly increased mortality by consumption of celphos for suicidal intent. Till date, there is no specific antidote for its intoxication and the poisoning carries extremely high mortality. The article will throw some light upon the recent advances that have been made regarding the management of acute aluminium sulphide poisoning (AAlPP).

Keywords: Aluminium phosphide poisoning; Celphos poisoning; AAlPP; ECMO; boric acid as an antidote to AAlPP

Introduction

AlP , a mitochondrial poison, exerts its toxicity due to deadly phosphine gas that is liberated when it reacts with water or hydrochloric acid in the stomach. Phosphine gas (PH_3), the active pesticide component of AlP, is rapidly absorbed by inhalation, ingestion, and skin or mucosal contacts. The mechanism of toxicity includes cellular hypoxia due to the effect on mitochondria, inhibition of cytochrome C oxidase and formation of highly reactive hydroxyl radicals. The signs and symptoms are nonspecific and instantaneous. The mortality ranges from 45% to 100%.

Discussion

In Northern India, when it comes to choosing a poison for suicidal intent, celphos is perhaps the favourite choice of victims- way ahead of barbiturates, organophosphorus or copper sulphate[1]. Upon contact with moisture in the environment, AlP undergoes a chemical reaction yielding phosphine gas. Phosphine inhibits cellular oxygen utilization and can induce lipid peroxidation. In the case of oral intake, the phosphine gas released is absorbed by the gastrointestinal tract with simple diffusion and is mainly excreted by the kidneys and lungs. Phosphine, like cyanide, inhibits mitochondrial cytochrome oxidase and cellular oxygen utilization [2,3,4].It can rapidly perturb mitochondrial conformation and inhibit oxidative respiration by 70%. This situation results a severe decrease in mitochondrial membrane potential [3]. AlP generates cellular superoxide and peroxide radicals, which trigger cellular damage by lipid peroxidation . The direct toxic effects of phosphine [5] and phosphides [6]on cardiac myocytes, fluid loss and adrenal gland can induce profound circulatory collapse. Death is usually a resultant of refractory myocardial depression, resistant hypotension,

severe metabolic acidosis and acute respiratory distress syndrome.

Traditionally , the management of AAlPP is largely symptomatic as there is no specific antidote available. Gastric lavage with potassium permanganate (1:10,000) is done as it oxidizes PH_3 to form non-toxic phosphate[7]. Activated charcoal (approximately 100 g) given through a nasogastric tube to delay the absorption. Liquid paraffin, that accelerate the excretion of AlP and phosphine is often used[8]. For symptomatic relief from severe gastritis, antacids and proton pump blockers are employed. As AlPP is often associated with hypoglycaemia, correction of plasma glucose level with glucose containing fluids is done. Circulatory shock is dealt with 24 hr low dose dopamine (4–6 µg/kg/min) and intravenous fluids[9]. Hydrocortisone 200–400 mg every 4–6 hr has been reported to be used with good results[10]. Patients who land up in ARDS require intensive care monitoring and mechanical ventilation. If systolic blood pressure is >90 mm Hg, Diuretics may be used to enhance excretion as the main route of elimination of phosphine is renal [11]. Arrhythmias are common and they are managed just as any other situation. Metabolic acidosis requires administration of intravenous sadium bicarbonate. Dialysis may be required for severe acidosis and acute renal failure .

Specific therapy and recent advances:

The clinical management of intoxication from AlP is mainly supportive. In one study, intravenous magnesium has shown significant improvement in indicators of oxidative stress and a lower incidence of mortality (20%) in comparison to control subjects (44% mortality) 17. Oral administration of the anti-ischemic drug trimetazidine, which works through a metabolic mechanism of decreasing the production of oxygen-derived free radicals and stimulating the oxidative metabolism of glucose has been suggested to decrease mortality14,15. Administration of sorbitol solution (at a dose of 1-2 ml/kg) as a cathartic and vegetable oils and liquid paraffin as inhibitor of phosphine release from the overdosed AlP has been suggested17. coconut oil has been shown to have a role in managing acute AlP poisoning even 6 h post ingestion 18. Digoxin has been suggested for treatment of cardiogenic shock induced by acute AlP intoxication19.

Case reports and studies are available which suggest the treatment with various agents by various regimens with varying results. N-omega-nitro-L-arginine methyl ester (L-NAME)[20], N-acetylcysteine [20], hyperbaric oxygen [21], 25Mg2+-carrying nanoparticles [22], intragastric irrigation with sweet almond oil[22], combination of vitamin C and methylene blue[23], extensive gastric lavage with coconut oil and sodium bicarbonate solution with simultaneous aspiration[24], intra-aortic balloon pump[25], have all been used in isolation or in conjucnction with one another.

However, above all of them, Extracorporeal membrane oxygenation (ECMO) seems to hold the maximum promise regarding success management of this lethal poisoning. ECMO is a modified "heart-lung" machine to provide temporary cardiorespiratory support. Timely intervention with ECMO in patients with AlP poisoning-induced severe metabolic acidosis and refractory cardiogenic shock has shown significant improvement in overall survival in several trials and studies. Although EMCO is associated with significant complication rates of its own, it might come up as a promising “bridge therapy” in cases with intractable cardiorespiratory failure caused by AlP poisoning who are not responding to conventional treatment.[26,28,29]

Soltani etal have purposed a very interesting hypothesis stating Boric acid as a “trapping agent” for deadly phosphine gas and hence, purposes it be a specific antidote. Boric acid is a non-toxic Lewis acid which efficiently traps PH3 gas. In this reaction, boric acid acts as a Lewis acid and phosphine acts as a Lewis base. The resulted polar reaction product which has H and OH groups can form hydrogen bonds with water molecules and hence can be excreted in urine by the body[30]. Though the idea appears very practical in theory, the hypothesis is yet to be tested for In vitro and in vivo studies.

Conclusion

Although there is no specific treatment for

AAlPP as yet, various agents have been used with reasonable success. EMCO has proved to be a game changer. Boric acid could be the answer for the future.

Conflict of interest

None declared

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Case Report

Accidental Hanging- A Rare Case

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Abstract

Hanging is a common method of suicide among Indian population. Accidental hanging is not a means to take one's own life. As the name suggests it is an accidental incident. When ingredients like rope with noose is found over neck of an individual leading to death, it becomes an easy affair for anyone to term as suicidal hanging including police, with their limited knowledge. Reporters find it as sensational news. Due to ignorance 'Accidental Hanging' is considered as 'Suicide' causing a huge emotional public outburst. One such incident occurred in our National Capital, resulting in headlines in all national and regional news papers and main news item in electronic media for a week, leaving all other important news.

Keywords
Suicide versus Accidental Hanging, Acting of hanging leading to fatality

Introduction

Hanging- This is a type of asphyxia death due to constricting of the air passage at the neck, as a result of suspension of the body by a ligature in form of a noose, applied in such a manner, when weight of the body or other part of the body e.g. head acts as a constriction force.(1) Accidental hanging forms a part of medico legal classification of hanging. Accidental hanging is a rare occurrence. In this case report, this rare incidence had a nationwide outcry. The incident was not only discussed in Parliament, but was also in the national news. It was broadcasted worldwide, turning it to a global event for a cause which was not worth.

Case Report

The …rally …took a tragic turn, when a farmer … ended his life by hanging himself from a tree. What made the death… more poignant was the suspicion that he may not have intended to commit suicide and may have accidentally killed himself.(2) Eyewitness accounts and police sources show the victim climbed the tree after being provoked by a group. A cop said footage showed few people giving him a helping hand ….he is seen waving and people applauding. There after he is seen tying one end of his gamcha (scarf) to a branch and the other to his neck. .. Forensic experts and witness accounts show the victim most probably slipped immediately after tying the knot… said the branch he was resting his foot on was not very wide. Police have scanned … found no conspiracy (3). Soon after climbing tree the victim called his brother… asking him to switch on TV. "Channels will show only me, doesn't matter who's on stage making a speech'… His political ambition were well-known… he wanted to champion farmers' issue… he was keen to make a name… had told family he'd be back after appearing on TV.(4)

Discussion

Hanging can occur accidentally while at work, play or show performance of circus party, while imitating judicial hanging or exhibiting hanging exercises(5)…it can occur, when morbid curious or foolish motive induces the victim to play with rope…A rapid loss of consciousness brings out the fatal result. This may be intriguing for the investigation officer and mysterious to the autopsy surgeon and relatives.(6)

Accidental hanging can happen in autoerotic masochistic performances. The victim is usually adolescent males, and very rarely females. They are found nude or wearing female attires, at times evidences of manipulation of sexual organs may be noticed. The safety margin is low so fatal consequences are not uncommon. It can happen in boys climbing ladders or railings or even experimenting with rope in hanging exercises or acting as happened in the case report.

In Post Mortem report, all the possible signs of ante mortem hanging will be present, but that would not point to accidental hanging. Only the circumstantial evidence would point to the cause. In this very case there was no pre disposing cause for suicide, the victim a 43 year old male a flamboyant and determined. He had an ambition to serve his fellow farmers. He also had ambition to be famous, so that he could be viewed in TV for which he took an uncommon step, and met with an accident.

Conclusion

Accidental Hanging may be intriguing for the investigating officer and mysterious to the autopsy surgeon and relatives, is indeed true. In this case since the incident happened in open in front of thousands eyes and camera. It was not difficult for investigating officer to come to a conclusion. Also journalists having poor knowledge on various terms of forensic termed this as suicide, which fanned the flame of imagination among common people leading to widespread publicity.

Conflict of interest

None declared

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Review Article

Violence against Women : Health Consequences and Role of Health Professionals

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Abstract

Taking into understanding the rise in the reported cases of violence against womenand also the gaps in responding to the needs of survivors at various levels,MOHFW is committed to setting up of standardized guidelines & protocols for care, treatment and rehabilitative services for survivors of sexual violence.

Key Words
Violence against women, Health Professionals & VAW

Introduction

Anything cannot be more expressive than the panic the victim of sexual violence suffers. She is afraid, escaping in her own country from the social evils. Violence against women (VAW) is an epidemic, rampant and an abhorrent act. In addition to being a violation of human rights, it's a public health issue with serious physical, mental and sexual health consequences. There is a need to address the economic and the sociocultural factors that foster a culture of VAW.In our country, around one in every three womenis likely to face this sort of violence in her lifetime with alarming statistics.

The health care system is the only institution that interacts with almost every woman at some point in her life and women living with violence are likely to visit health facilities more frequently than non-abused women. Interventions by health providers can potentially mitigate both the short and long-term health effects of gender-based violence on women and their families.

The Ministry of Health and Family Welfare recognizes the critical role to be played by the Health professionals and health systems in caring for survivors/victims of sexual violence and collecting relevant evidence so that the culprit could be brought to the book. It also recognises the critical role of health professionals in their interface with the police, CWCs and the judiciary. Such intersectoral collaboration is essential to provide services and deliver justice.

Health consequences and role of Health Professionals

Survivors of sexual violence may present to health care services with varying signs and symptoms. In addition to the violation of the human rights, there may be several direct and indirect, physical/psychological, short/long term health consequences. For those, who do not reveal a history, a few of the signs and symptoms immediately prompt one to suspect the possibility of sexual abuse/assault.

Role of the health facility and components of comprehensive health care response:

Health professionals play a dual role in responding to the survivors of sexual assault. After making an assessment regarding the severity of sexual violence, the first responsibility of the doctor is to provide the required medical treatment and psychological support and attend to the survivor's needs. While doing so it is pertinent to remember that the sites of treatment are also to be examined for evidence collection later. Secondly, they assist the survivors in their medico-legal proceedings by collecting evidence and ensuring a good quality documentation.

Legal obligations of the health worker in cases of sexual violence

Under Section 164 (A) of the Criminal Procedure Code there are legal obligations of the

health worker too. Examination of a case of rape is to be conducted without delay by a registered medical practitioner (RMP) employed in a hospital run by the government or a local authority and in the absence of such a practitioner, by any other RMP & a reasoned report is to be prepared. The consent obtained specifically for this examination & exact time of start and close of examination is to be recorded. The report is forwarded without delay to Investigating Officer (IO), and in turn IO to the Magistrate.

The Criminal Law (Amendment) Act, 2013 is an Indian legislation passed by the LokSabha on 19 March 2013, and by the RajyaSabha on 21 March 2013, which provides for amendment of Indian Penal Code, Indian Evidence Act, and Code of Criminal Procedure, 1973 on laws related to sexual offences. The Bill received Presidential assent on 2 April 2013 and came into force from 3 April 2013. It was originally an Ordinance promulgated by the President of India, Pranab Mukherjee, on 3 April 2013, in light of the protests in the 2012 Delhi gang rape case.

The Criminal Law Amendment Act 2013, in Section 357C Cr.PC says that both private and public health professionals are obligated to provide treatment. Denial of treatment of rape survivors is punishable under Section 166 B IPC with imprisonment for a term which may extend to one year or with fine or with both.

Health professionals need to respond comprehensively to the needs of survivors.

The components of a comprehensive response include

Establishing a uniform method of examination and evidence collection by following the protocols in the Sexual Assault Forensic Evidence (SAFE) kit. Informed consent for examination, evidence collection and informing the police. First contact psychological support and validation. Maintaining a clear and fool-proof chain of custody of medical evidence collected. Referring to appropriate agencies for further assistance (e.g. Legal support services, shelter services, etc).

The World Health Organization does not recommend universal screening for violence of women attending health care. WHO does encourage health care providers to raise the topic with women who have injuries or conditions that they suspect may be related to violence.

Its important for health care providers to be aware that a woman's health problems may be caused or made worse by violence. The health provider may suspect & identify women who may be subjected to violence if she has any of on going emotional health issues such as stress, anxiety or depression, harmful behaviour such as misuse of alcohol or drugs, thoughts plans or acts of self harm or attempted suicide, injuries that are repeated or not well explained, unwanted pregnancies, unexplained chronic pain or conditions (pelvic pain or sexual problems, gastrointestinal problems, kidney or bladder infections, headaches), repeated health consultations with no clear diagnosis.

Violence may also be suspected if a woman's partner or husband is intrustive during consultations, if she often misses her own or her children's healthcare appointments, or if her children have emotional or behavioral problems. It is important to establish a rapport with the survivor. Depending on her answers questions may be continued and listen to her story. In case of affirmative answers to any of the direct questions, simple and direct questions may be asked so that she knows that you are interested in hearing her problems. Some women may not like the words ''violence'' and ''abuse''. Cultures and communities have ways of referring to the problem with other words. It is recommended to use language that is appropriate and relevant to the culture and community you are working in &its also important to use the words that women themselves use. The questions related to violence should be asked in an empathic, non judgemental manner.

Often first line support is the most

important care the health professional can provide by practical care and response to the women's emotional, physical, safety and support needs without intruding on her privacy. The goals of first line support are to identify her needs and concern, listen and validate her concerns and experiences, help her to feel connected to others, calm and hopeful, empowering her to feel able to help herself and to ask for help. Exploring what her options are, respecting her wishes, helping her to find social physical and emotional need & enhancing safety are also important. When you help her deal with her practical needs it helps her with her emotional needs and vice-versa. Never say or do anything to suggest disbelief regarding the incident. Do not pass judgmental remarks or comments that might appear unsympathetic. Appreciate the survivor's strength in coming to the hospital as it can serve to build a bond of trust. Convey important messages such as: the survivor is not responsible for precipitating the act of rape by any of her actions or inactions. Explain to the survivor that this is a crime/violence and not an act of lust or for sexual pleasure. Emphasize that this is not a loss of honour, modesty or chastity but a violation of his/her rights and it is the perpetrator who should be ashamed.

Facilitating Procedures

The health worker should explain to the survivor in simple and understandable language the rationale for various procedures and details of how they will be performed.

The protocol and guidelines aim to achieve the following: Operationalise informed consent and respect autonomy of survivors in making decisions about examination, treatment and police intimation. There are specific guidance on dealing with persons from marginalised groups like persons with disabilities, sex workers, LGBT persons, children, persons facing caste, class or religion based discriminationor persons from minority community. Ensure gender sensitivity in the entire procedure by disallowing any mention of past sexual practices through comments on size of vaginal introitus, elasticity of vagina or anus. Further, it bars comments of built/height-weight/nutrition or gait that perpetuate stereotypes about 'victims'. Focus on history by recognising various forms and dynamics of sexual violence including activities that lead to loss of evidence. Evidence collection based on science and history, with specific guidance for taking relevant samples and preservation of evidence is a must. Lay down standard treatment protocols & guidelines for managing health consequences of sexual violence and provision of first line psychological support.

Ensure confidentiality & establish rapport with the survivor. Explain to the survivor that she/he must reveal the entire history to health professional without fear. The survivor may be persuaded not to hide anything. Explain the fact that genital examination may be uncomfortable but is necessary for legal purposes. The survivor should be informed about the need to carry out additional procedures such as x-rays, etc. which may require him/her to visit to others departments.

Examination

The history taking & examination should be carried out in complete privacy in the special room set up in the hospital for examination of sexual violence survivor. The room should have adequate space, sufficient lighting, a comfortable examination table, all the equipment required for a thorough examination documented in the sexual assault forensic evidence (SAFE) kit list for collecting and preserving physical evidence following a sexual violence:

P/V examination, commonly referred to by lay pesons as 'two finger test' must not be conducted for establishing an incident of sexual violence & no comment on the size of the vaginal introitus, elasticity of the vagina or hymen or about past sexual experience or habituation to sexual intercourse should be made as it has no bearing on a case of sexual violence. No comment on shape size and/or elasticity of the anal opening or about

previous sexual experience or habituation to the anal intercourse should be made.

While performing the examination, the purpose of forensic medical examination is to form an opinion on: Whether a sexual act has been attempted or completed. Whether such a sexual act is recent.Whether any harm has been caused to the survivor's body. This could include injuries inflicted on the survivor by the accused and by the survivor on the accused. However, the absence of signs of struggle does not imply consent. The age of the survivor needs to be verified in the case of adolescent girls/boys. Whether alcohol or drugs have been administered to the survivor also needs to be ascertained.

The women with life threatening or severe conditions should be referred for emergency treatment and urgent hospitalization.

Along with councilling, emergency contraception, in the form of EC pill or emergency copper IUD, should be offered to the women who have been sexually assaulted, so that she can make an informed decision. Women should also be given antibiotics to prevent and treat the sexually transmitted infections (STI's). There's no need to test for STI's before treating. The women exposed to sexual violence should also be offered immunisation for Hepatitis B. Postexposure prophylaxis (PEP) to prevent HIV should be started as soon as possible upto 72hrs after possible exposure to HIV.

There should be follow up visits after 2 weeks, 1 month, 3 months and 6 months after the assault for the injuries, STI's, pregnancy, mental health and planning.

To summarize, the Health professionals and health systems play a critical role in caring for survivors/victims of sexual violence and collecting relevant evidence so that the culprit could be brought to the book. These guidelines are helpful to all the medical practitioners to deal with such cases in an informed manner and contribute to make India a better and safe place to live in.

Conflict of interest

None declared

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PAFMAT
News and Views: Assault on Doctors

Recent incidents of violence against doctors and subsequent protests by medical practitioners once again highlight that the doctor-patient relationship has changed for the worse. True, violence against doctors cannot be condoned on any grounds. However, it is important to acknowledge the root cause of the increasing assaults on medical practitioners.

Dr DS Bhullar
Editor-in-Chief Journal of PAFMAT

The assault on doctors should be made punishable by minimum of seven years rigorous imprisonment with fine and offence should be made non-bailable. The attackers should be made to compensate the whole loss of property of any doctor. It should be uniform all over the country

Dr Gurmanjit Rai

Public starts misbehaving when they come to know that doctor is a toothless tiger. Nobody misbehaves with a senior police officer. The corporate hospitals are misleading relatives to believe that smaller hospital which referred the case has maltreated the case. This is to enhance seriousness for making fat bills. So either quacks or specialists are ruling. In all cases of assault and alleged medical negligence, an ombudsman should be created, headed by forensic doctors with investigation powers and full police thana control, something like medical examiner system. This branch of forensic medicine will be considered super-specialization.

Dr. Dildar Singh

A patient brought to Government Hospital Sector 16 Chandigarh at 4-00 A.M. with history of being assaulted. Police said there was a loud noise too. Patient given pain killer, injury described as an abrasion and sent home. Went again to hospital at 12 noon with pain abdomen and chest. Advised X-Ray with normal result and sent home. Again came at 3.00 PM and collapsed and died. PM examination revealed rifled fire arm injury with bullet lodged in pelvis. So much for expertise of doctors. They deserve what they are getting.

Dr. D. Harish

We are responsible for these things. Doctors are becoming greedy. Privatization of medical profession leads to all these things. Further, growth of RMP, touts and agents leads to exploitation of patients. Entrance should be tough. Medical profession should be given to a person who deserves it. Documentation of record should be up to mark. We are responsible for all this.

Dr. Rajiv Joshi

There is a thin line of difference between the word business and profession. Profession is governed by professional ethics and regulations set by the professional bodies overseeing the professional practices. When any profession crosses that thin line and start doing business instead of practicing profession, ethics are compromised and malpractices creep in. when it happens with any profession, social image and esteem is bound to face crisis and this is true for all professions.

Dr. Navpreet Kaur

In this regard, there's no escaping the fact that commercialization of the medical profession has brought us to this pass. This commercialization process starts right from the medical education level where many students pay large capitation fees to gain admission through management quotas. As soon as such practices are allowed, medical education becomes an investment for future earnings. And if the medical profession is treated just like any other career, then problems are bound to crop up.

Dr. Nikhil Mehta

We must accept the fact that the medical profession is unlike any other job. Doctors directly deal with human lives and stand between life and death. This is precisely why doctors have a status only next to God. But if doctors make money the sole driver of their profession, then they lose that godly status and become mere mortals.

Dr. KK Aggarwal

Earlier, those who became doctors did so to help people. That was their sole motivation. However, today medicine is just another career option with private hospitals becoming money-making machines where doctors are given monthly targets to generate revenues. This has created the impression that doctors are untrustworthy; they push unnecessary treatments, and are not honest with patients' relatives. In fact, hospitals have become places full of fear and dread rather than places of healing. This is precisely the reason assaults on doctors are happening.

Dr. SS Oberoi

What can be done?

Though the scenario seems gloomy, tackling the problem requires residents' participation.

- Doctors should work with the government in creating an effective strategy to prevent hospital violence.
- Security personnel should be posted at the entrance of every hospital and should not let anyone through without checking for identification.
- Weapons should be confiscated before allowing passage to anyone.
- All attendants must register at the front desk and be given a visitor badge to be worn at all times.
- No more than two attendants should be allowed with the patient.
- Laws against doctor assault should be prominently displayed on the walls of the hospital.
- To ensure doctor safety, every hospital should create an emergency protocol and an evacuation plan in case of a major act of violence.

INSTRUCTIONS TO AUTHORS

Preparing a Manuscript For Submission to Journal of Punjab Academy of Forensic Medicine and Toxicology

Unpublished Ethical, Un-Plagiarised original manuscript written in English should be sent to:

Dr. D S Bhullar, Editor-in-Chief, Journal of Punjab Academy of Forensic Medicine and Toxicology by email at: editorinchief@pafmat.com

The Publication Particulars

The JPAFMAT is the official publication of the Punjab Academy of Forensic Medicine & Toxicology, published since 2001.

The Contents of the Journal

The journal accepts a range of articles of interest, under several feature sections as follows:

- Original Papers: Includes conventional observational and experimental research.
- Commentary: Intended for Reviews, Case Reports, Preliminary Report and Scientific Correspondences.

Letter to the Editor

Designed to be an avenue for dialogue between the authors of the papers published in the journal and the readers restricted to the options expressing reviews, criticisms etc. It could also publish letters on behalf of the current affairs in the field of Forensic medicine in the country.

Editorial

Intended as a platform, for the Editor-in-Chief and for others with a keen interest in forensic medicine that wished to comment on the current affairs.

Special Features

In the History of Indian Forensic Medicine, Book Review, Abstracts, Announcement etc, which appear frequently, but not necessarily in every issue.

News and Notes

Intended for providing information of members and activities of the Academy and other such other organizations affiliated to the Academy may appear frequently and not in every issue.

General Principles

The text of observational and experimental articles is usually (but not necessarily) divided into the following sections: Introduction, Methods, Results, and Discussion.

This so-called "IMRAD" structure is not an arbitrary publication format but rather a direct reflection of the process of scientific discovery. Long articles may need subheadings within some sections (especially Results and Discussion) to clarify their content. Other types of articles, such as case reports, reviews, and editorials, probably need to be formatted differently. Electronic formats have created opportunities for adding details or whole sections, layering information, crosslinking or extracting portions of articles, and the like only in the electronic version. Double spacing all portions of the manuscript— including the title page, abstract, text, acknowledgments, references, individual tables, and legends—and generous margins make it possible for editors and reviewers to edit the text line by line and add comments and queries directly on the paper copy. If manuscripts are submitted electronically, the files should be double-spaced to facilitate printing for reviewing and editing. Authors should number all of the pages of the manuscript consecutively, beginning with the title page, to facilitate the editorial process.

International Uniform Requirements

Please visit **http://www.icmje.org/** for detailed instructions for manuscript submission.

Format of Application for Membership

To

The General Secretary
Punjab Academy of Forensic Medicine & Toxicology (PAFMAT)

Dear Sir,

I wish to become a Life Member / Annual Member of PAFMAT. I am furnishing the required particulars below with a request to enrol me in the academy. The fee of Rs. 1000 / Rs. ---- for Life Membership / Annul Membership is enclosed as a Demand Draft with No_____ Of _____Bank, in the name of PAFMAT, SBOP Chandigarh along with my two passport size photographs.
I have gone / will go through the rules and regulations of the academy and I agree to abide by the same.

PARTICULARS

1. Full Name (in block letters)
2. Father's / Husband's name
3. Date of Birth
4. Qualification (with name of university & date of passing)
5. Official Designation & Place of Posting
6. Permanent Address
7. Address for Correspondence (subsequent change of address to be intimated)
8. Phone No. & Email

Place Yours Sincerely

Date

(Signature)

FOR USE OF PAFMAT
Membership Accepted with Life / Annual membership No. / PAFMAT / /

Dated

Treasurer **President**

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Punjab Academy of Forensic Medicine & Toxicology

Undertaking format for organizing PAFMATCON

(To be prepared in duplicate)

To
The President / General Secretary
Punjab Academy of Forensic Medicine & Toxicology

Sub: Consent for holding the conference.

Dear Sir

As discussed and decided in the general / executive body meeting of the academy dated ……..at ……..……(*name the venue*), I give my consent to hold the ……annual conference of Punjab Academy of Forensic Medicine & Toxicology on ……(*Tentative date*) in …… (*Name of the medical college / venue*) subject to the following:-

a. The conference and / or the CME programme shall be under the auspices of Punjab Academy of Forensic Medicine & Toxicology. The banner showing the same will be displayed at a suitable area on the main venue.
b. The President and the General Secretary of the Academy will be suitably seated on the dais during the inaugural programme. The President will address the gathering about the policies, programs or other relevant aspects of the Academy. The General Secretary will read out the annual report.
c. The registration of the President, General Secretary, Secretary Finance and the Editor-in-Chief of the Academy will be complimentary.
d. The conference will get accredited with at least 4 CME Credit hours from Punjab Medical Council.
e. The President and / or General Secretary of the Academy along with one member of Punjab Medical Council will be the signatory to the certificate issued to delegate attending the conference / CME / workshop.
f. The organizing committee will send formal invitation to all the office bearers of the academy.
g. The Journal of the Academy will be released during the inaugural programme. The Editor-in-Chief and the Joint Editor will be invited to the dais for the release ceremony.
h. The Organizing Secretary of the programme will hand over the list of the delegates to the General Secretary of the Academy at the end of the conference.
i. The Organizing Committee will collect Rs. 100/- (Rupees one hundred only) per delegate of the programme and will deposit the collected amount in the account of the Journal of PAFMAT / hand over the Cheque for the collected amount favoring Journal of Pb. Aca. Of Forensic Med. & Toxicology to the Editor-in-Chief after the conference.

Sd/-

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