

Awareness of forensic odontology among dental practitioners in Chennai: A knowledge, attitude, practice study

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Abstract

Objective: The aim of the study is to analyze the knowledge, attitude and practice of forensic odontology among dental practitioners in Chennai. **Materials and Methods:** A cross-sectional study was conducted in a sample of 322 dental practitioners in Chennai and data was collected by means of a questionnaire. **Results:** Twenty-one percent of the dental practitioners did not maintain dental records in their clinic/workplace, with only 12% of the practitioners maintaining complete records. Ninety-three percent of dental practitioners were not maintaining dental records for more than seven years. The significance of ante-mortem records in identifying deceased suspects was not known to 17% of the dental practitioners. Forty percent of the dental practitioners were not aware of child abuse and the actions to be taken. Dental age estimation was not known to 41% of the dental practitioners. Thirty-eight percent of the practitioners were unaware of the accurate method of individual identification. About 18% of the dental practitioners did not know the significance of bite mark patterns of the teeth. Ninety-three percent of the practitioners lacked formal training in collecting, evaluating and presenting dental evidence. Thirty percent of dental practitioners did not know they can testify as an expert witness in the court of law. Forty percent of the dental practitioners were unaware of identifying the age and gender of an individual in mass disasters. **Conclusion:** Our study revealed inadequate knowledge, poor attitude and lack of practice of forensic odontology prevailing among the dental practitioners in Chennai.


Key words: Chennai, dental practitioners, forensic odontology, knowledge, attitude and practice study

Introduction

Forensic dentistry is a challenging and fascinating branch of forensic science that involves the application of dental sciences in the identification of deceased individuals

through the comparison of ante- and post-mortem records. From AD 66 till date, dental identification has proved vital in identifying deceased individuals, the first case being accepted by the law in the year 1849.^[1] Recently, forensic odontology has evolved as a new ray of hope in assisting forensic medicine, but, this vital and integral field of forensic medicine is still in a state of infancy in India.^[2] There are not many institutions offering formal training in forensic odontology, with lack of job opportunities for qualified forensic odontologists who have obtained degrees abroad.

The important applications of forensic odontology include identification of human remains through dental records and assisting at the scene of crime; in cases of suspected

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child or adult abuse through bite marks or physical injuries; determination of age and gender of the living or deceased and to testify as an expert witness in the court to present forensic dental evidence.

The question always arises as to whether the dental practitioners should know about forensic odontology, the reason being that dental identification provides an accurate source of identification of the victim or the suspect. In recent times, natural and man-made disasters are occurring more frequently in India. Under these conditions, the bodies of the victims become mutilated beyond recognition, where the vital role of dental surgeons comes into picture in the identification of such individuals.

Keeping this as the background, this study was undertaken to analyze and assess the awareness about forensic odontology among the dental practitioners in Chennai.

Materials and Methods

1. Population of dental practitioners in Chennai
2. Data collection

The questionnaire was designed for practicing dental practitioners, who in their day-to-day life might be encountering cases of forensic interest.

A cross-sectional study was conducted among 322 dental practitioners in Chennai. Data was collected in a personalized manner by means of the questionnaire. The questions were both open-ended and close-ended [Table 1].

The questions were framed to assess the KAP criteria—knowledge, attitude and practice. Information was obtained on the following matters:

1. Knowledge about the significance of dental records, identification of child abuse, dental age estimation, identification of an individual, bite marks and as a witness in the court.
2. Practices about maintenance of dental records and attitude of the practitioner towards maintenance of dental records and towards child abuse.

Results

Do you maintain dental records in your clinic? If so, which of the following are maintained and for how long?

Twenty-one percent dental practitioners did not maintain dental records in their clinic. Of the remaining seventy-nine percent, only twelve percent maintained complete dental records. Ninety-three percent of the practitioners maintained the dental records for less than seven years.

Table 1: Questionnaire used in the study

1. Do you maintain dental records in your clinic? Yes/No	
2. If yes, which of the following are regularly maintained, and for how long?	
a. Patient details	f. Photographs
b. Medical history	g. Study casts
c. Family history	h. Radiographs
d. Clinical findings	i. Investigation findings
e. Treatment plan	j. Treatment log
Duration of maintenance of dental records:	
3. Are you aware of the significance of maintaining dental records in identifying the deceased and crime suspects? Yes/No	
4. How can you identify physical/neglective/sexual/psychological abuse of a child?	
5. What would you do if you identify signs or symptoms of child abuse?	
6. How do you estimate the dental age of an individual by examining the teeth?	
7. Which of the following is the most accurate and sensitive method to identify an individual?	
a. Visual identification	d. Serological comparison
b. Finger prints	e. DNA comparison
c. Physical anthropological examination of bones and teeth	
8. Are you aware of the bite mark patterns of teeth? Yes/No	
9. Have you had any formal training in collecting, evaluating and presenting dental evidence? Yes/No	
10. Are you aware that you can testify as an expert witness in the court to present forensic dental evidence? Yes/No	
11. How will you identify the age and gender of the deceased in the event of a mass disaster?	

Are you aware of the significance of maintaining dental records in identifying the deceased and crime suspects? Yes/No

The significance of maintaining dental records in identifying the deceased and crime suspects was not known to 17% of dental practitioners.

How can you identify physical/neglective/sexual/psychological abuse of a child?

Forty percent dental practitioners did not know to identify child abuse, while the rest said they would identify by physical injuries, scars, behavior, clothing, nourishment etc.

What would you do if you identify signs or symptoms of child abuse?

Thirty-four percent dental practitioners did not give any answers, while the remaining spoke about parental/child counseling and reporting to the child care authorities.

How do you estimate the dental age of an individual by examining the teeth?

Forty one percent dental practitioners did not know how to estimate the age of an individual by examining the teeth.

Which of the following is the most accurate and sensitive method to identify an individual?

Thirty-eight percent of the dental practitioners did not know the accurate and sensitive way to identify an individual. The remaining sixty-two percent answered that DNA and fingerprints would be an accurate and sensitive method for identification.

Are you aware of the bite mark patterns of teeth? Yes/No

About 18% of the dental practitioners did not know the significance of bite mark patterns of the teeth.

Have you had any formal training in collecting, evaluating and presenting dental evidence? Yes/No

Ninety-three percent of the dental practitioners did not have any formal training in collecting, evaluating and presenting dental evidence.

Are you aware that you can testify as an expert witness in the court to present forensic dental evidence?

Thirty percent of the dental practitioners were not aware that they could testify as an expert witness in the court of law.

How will you identify the age and gender of the deceased in the event of a mass disaster?

Forty-two percent dental practitioners did not know to identify the age and gender of the deceased in the event of a mass disaster.

Discussion

Forensic odontology is an important branch of the study of dentistry that would assist in solving cases of abuses and deaths. Greater knowledge and awareness of forensic odontology among the dental practitioners would be required in the growing field of medicine.

The practice of forensic odontology has gained importance in a number of developed countries across the world. But in developing countries like India, it is yet to gain full momentum. The death toll in India due to the tsunami in 2004 was more than 15,000^[3] but it is a question left unanswered, whether all victims were identified. This could have been made possible if there were adequate forensic odontologists for identification of the victims.

The law enforcement authorities in India usually seek the help of dental surgeons in government service rather than dental practitioners who have degrees in forensic odontology from universities outside India and who are not in government service. The outcome is that there is a

dearth of qualified forensic odontologists in India, which is evident by the rare instances wherein forensic odontology has been applied successfully in solving criminal cases or to identify the deceased. One such successfully reported case is that of the assassination of the former Prime Minister of India, Mr. Rajiv Gandhi, where the forensic odontologists had played a very valuable role.^[4]

This study was conducted among the dental practitioners to assess their awareness about forensic odontology. The results show that the knowledge of forensic odontology among the dental practitioners is not adequate.

The significance of forensic odontology can be attributed to the ability of the dental tissues to withstand environmental assaults and still retain some of its original structure. This makes teeth an excellent and an accurate source for DNA material.^[5] Even the few practitioners who were aware of this, answered more by their knowledge that was gained through the media.

Forensic dentists who are associated with identification of the deceased and crime investigations are usually required to provide testimony in the court of law in the capacity of an 'expert witness'.^[6] Nearly one-third of the respondents were not aware that they could testify as an expert witness in court to present forensic evidence, while a few were not willing to testify even if called upon, according to this study.

Age is one of the essential factors in establishing the identity of a person. Estimation of the human age is a procedure adopted by anthropologists, archaeologists and forensic scientists.^[7,8] This has helped forensic odontologists to solve cases in countries abroad, and could similarly play a very important role in solving cases in India. But nearly half of the practitioners did not know how to estimate the dental age by examining the teeth. The reasons for this could be multifactorial, either their ignorance/lack of basic knowledge or lack of confidence in answering this question, apart from not knowing the significance of dental age with regard to forensics.

All cases of child abuse, which are greatly growing in number in day-to-day life, should be detected as soon as possible. The teeth can also be used as weapon and, under certain circumstances, may leave information as to the identity of the biter. Analysis of bite marks is one of the major responsibilities of a forensic dentist.^[9] Therefore, dental health professionals have to be alert about a variety of physical and behavioral indicators to identify suspected child abuse. If the dentist suspects physical abuse with a young patient, then he or she should have another dental staff member witness the injuries and assist in their documentation.

Although reports show that the majority of victims sustain injuries in the head and neck region, few dentists recognize

domestic violence as a problem that their patients encounter and fewer have protocols in place to facilitate intervention. Reasons commonly cited for a dentist's failure to report are lack of education about the signs and symptoms of abuse and neglect, ignorance of the reporting procedure and concern about making a false accusation and disrupting the dentist's relationship with the family.^[10] Child abuse is presenting a serious social problem with global dimensions, increasing at an alarming rate in all socioeconomic strata and all ethnic or racial communities.^[11] Child abuse and neglect is any interaction or lack of interaction between a caregiver and a child resulting in non-accidental harm to the child's physical and developmental state.^[12] Nearly half of the dental practitioners did not know how to identify child abuse; a few of them not knowing the actions to be taken in cases of child abuse. A few practitioners who were aware of child abuse suggested referral of the cases to a psychiatrist/pediatrician, as they claimed it was not their field of work.

The identification of a large number of casualties in mass disasters is complex and fraught with hazards, both physically and emotionally. A forensic anthropologist may be called in when human remains are found during archaeological excavation, or when badly decomposed, burned, or skeletonised remains are found by law enforcement or members of the public.^[13] Most of the dental practitioners in the study were not aware of the methods to identify the age and gender of the deceased individuals, which is where the most vital role of a forensic odontologist comes into play.

The dental record serves a purpose of future reference for the practitioners when needed, and is not always maintained for a forensic purpose. It is also maintained as consumer court evidence and for dental insurances.^[14] There has been an increasing awareness among the public regarding legal issues involving healthcare, which warrants for any dental practitioner to have a thorough knowledge of dental record issues.^[14] Whether the records maintained by practitioners are complete and useful for forensic odontology would be a valid question to consider

The majority of the dental practitioners were aware of the significance of maintaining dental records. Strikingly, only very few practitioners maintain complete records and very few knew the duration of dental record maintenance as stated by the law, which is a minimum of seven years to a maximum of ten years.^[15]

The study shows clearly that there is a general lack of practice of forensic odontology among dental practitioners in India. This could be owing to multiple reasons. There are very few institutions offering formal training in forensic odontology. Most of the practitioners had no formal training. There are no fully equipped labs for forensic odontology in India. Forensic odontology was not included as a part of our academic curriculum until recently. There are very few workshops or

conferences that have been conducted in forensic odontology per year for dental surgeons, which could kindle an interest among the students to probe deeper into the subject.

This study covers most parts though not all, of Chennai, a metropolitan city, having around 332 dental practitioners, including both government and private practitioners as the study subjects.

Conclusion

This study, conducted among 322 dental practitioners regarding their awareness about forensic odontology, revealed inadequate knowledge, poor attitude and lack of practice prevailing among these study subjects. This study reflects the current situation of our country in the field of forensic odontology.

This condition, however, could be improved if necessary steps are taken to make forensic odontology a part of our course. In addition, periodic conferences and seminars if conducted would help the dental practitioners and students enrich their knowledge about forensic odontology.

References

1. Chandra Shekar BR, Reddy CV. Role of dentist in person identification. *Indian J Dent Res* 2009;20:356-60.
2. Bagi BS. Role of forensic odontology in medicine. *J Indian Dent Assoc* 1977;49:359-63.
3. Tsunami Toll Updated. *SBS World News*, March 24, 2005.
4. Chandrasekharan P. The first human bomb. The untold story of Rajiv Gandhi assassination. *ALT Publ* 2010.
5. Pretty IA, Sweet D. A look at forensic dentistry-Part 1: The role of teeth in determination of human identity. *Br Dent J* 2001;190:359-66.
6. Rajendran R, Sivapathasundharam B. Editors. Shafer's textbook of Oral Pathology. 6th ed. India: Elsevier Pub; 2009.
7. Singh A, Gorea RK, Singla U. Age estimation from the physiological changes of teeth. *J Indian Acad Forensic Med* 2004;26:94-6.
8. Balwant Rai. Five markers of changes in teeth: An estimating of age. *Internet J Forensic Sci* 2006;1:
9. Babar MG. Essential guidelines for forensic odontology. *Pakistan Oral Dent J* 2007;27:79-84.
10. Sfikas PM. Does the dentist have an ethical duty to report child abuse? *J Am Dent Assoc* 1996;127:521-3.
11. Dhar V, Tandon S. Bite mark analysis in child abuse. *J Indian Soc Pedod Prev Dent* 1998;16:96-102.
12. Subramanian EM, Subhagya B, Muthu MS, Sivakumar N. Neglected child with substance abuse leading to child abuse: A case report. *J Indian Soc Pedod Prev Dent* 2005;23:92-5.
13. Adebisi SS. Forensic anthropology in perspective: The current trend. *Internet J Forensic Sci* 2009;4:1.
14. Charangowda BK. Dental records: An overview. *J Forensic Dent Sci* 2010;2:5-10.
15. Neville BW, Damn DD, Allen CM, Bouquot JE. Editors. *Oral and Maxillofacial Pathology*. 2nd ed. India: Elsevier Publ; 2004.

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