

Survey on knowledge, attitude and practice of forensic odontology among private dental practitioners in Ghaziabad city, India

Sharma A¹, Shokeen S², Arora R³, Dhaginakatti SA⁴

ABSTRACT

1,2,3PG Student, 4Professor & Head, Department of Public Health Dentistry, I.T.S-Centre for Dental Studies and Research, Muradnagar, Ghaziabad

Introduction: Forensic odontology involves application of dental sciences in the identification of deceased individuals through comparison of ante-mortem and post-mortem records.

Aim: To study knowledge, attitude and practice of forensic odontology among private dental practitioners in Ghaziabad city.

Material and Methods: A questionnaire based cross-sectional survey was conducted on 137 private dental practitioners in their dental clinic at Ghaziabad city. A 20 Item Structured questionnaire was used to assess knowledge of dentist about the significance of dental records, indicators of child abuse, dental age estimation, identification of an individual, bite marks and dentist as a witness in the court for forensic evidence. Questions regarding their attitude and practice about maintenance of dental records and source for update on recent advances in dental practice were assessed.

Results In our study only 11% B.D.S and 23% M.D.S dental practitioners maintain dental records in their clinic. 98.4% of B.D.S and 90% of M.D.S dental practitioners said that their knowledge level/ awareness regarding forensic odontology were perceived to be inadequate. 77% of B.D.S and 66% of M.D.S dental practitioners did not know the relevance of maintaining dental records for identification of criminals and dead-bodies. 96.7% of B.D.S and 95.9% M.D.S dental practitioners were not confident in handling forensic dentistry related cases.

Conclusion: Our study revealed prevalent inadequate knowledge, poor attitude and lack of practice pertaining to patient's dental record maintenance and clinical knowledge of forensic odontology among dental practitioners in Ghaziabad.

Keywords: Forensic odontology, Dental practitioners, Ghaziabad, knowledge, Attitude, Practice, Dental record.

Received: 09-02-2015
Accepted: 24-03-2015

INTRODUCTION

The word Forensic is derived from the Latin word forum, which means "court of law" and Odontology denotes study of teeth. Forensic odontology as defined by FDI is that branch of dentistry which in the interest of justice deals with the proper handling and examination of dental evidence and with the proper evaluation and presentation of dental findings.¹ Identification of an individual through dentition is not new to us. In India, first case of identification using dentition was that of king Canouj, Jayachandra Rathore in 1191, who died in war and his body was recognized by his false anterior teeth.²

Forensic odontology involves application of dental sciences in the identification of deceased individuals through comparison of ante-mortem and post-mortem records.³ Maintaining the superior, comprehensive quality of ante-mortem dental records leads to quicker and easier identification of the remnants. Indian Dental Association recommends that the records, radiographs, models, photographs and clinical correspondence should be securely retained for at least the legal minimum period of five years to

gratify judiciary and consumers, for protection against medical negligence.⁴

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. Also there are very few qualified forensic odontologists available in India. Private dental practitioners use to examine and treat a lot of patients daily during their practice hours, thus maintaining some sort of records for certain period of time. So, with increase in road traffic accidents, crime, violence, epidemic diseases and mass catastrophe, private dental practitioners can also play an important role in solving such cases. However, Dentists often sustain a poor quality of dental record maintenance in their clinics that leads to difficulty in dental identification of their patients.⁴ Dearth of data on this perspective in Ghaziabad the catchment area of I.T.S-C.D.S.R, Muradnagar directed us to conduct present cross sectional survey for assessing the knowledge, attitude and practice of the private dental practitioners regarding forensic odontology.

MATERIAL AND METHODS

After obtaining approval from Institutional authority of I.T.S-C.D.S.R, a questionnaire based

Address for Correspondence:

Dr. Anubhav Sharma, PG Student, Department of Public Health Dentistry, I.T.S-Centre for Dental Studies and Research, Muradnagar, Ghaziabad
Email: anubhavdoc@yahoo.co.uk

cross-sectional survey was conducted on 137 private dental practitioners in their dental clinic at Ghaziabad city during the month of July and August 2012.

List of private dental practitioners was prepared from commercial contact directories of Ghaziabad city. Through convenient sampling 150 private dental practitioners were approached and explained about the purpose of study telephonically by calibrated investigator, 137 of them gave verbal participatory consent and fixed the schedule with investigator. A self-reported, validated pretested close-ended questionnaire in English language based on previous studies was employed after pilot survey. Questionnaire includes response elicited through multiple choices and yes/no questions. A 20 Item Structured questionnaire was used to assess the knowledge of dentist about the significance of dental records, indicators of child abuse, dental age estimation, identification of an individual, bite marks and dentist as a witness in the court for forensic evidence. Questions regarding their attitude and practice about maintenance of dental records and source for update on recent advances in dental practice were assessed. To ensure reliability of the survey, a pilot study was done on 20 dental practitioners. The Questionnaire was explained by the investigator which was filled and returned by the study subjects in 10 -12 minutes. Data entry and Descriptive Statistical analysis was done by employing SPSS version 16.0.

RESULT

Of the 137 returned questionnaire, 120 were completely filled & were included in the analysis. Among 120 dental practitioners (90 male and 30

female), 85 were B.D.S and 35 M.D.S dental practitioners. Regarding maintenance of dental records (Table No. 1), only 11% B.D.S and 23% M.D.S dental practitioners do maintain dental records at their respective clinic. Among B.D.S dental practitioners those who maintain dental records, only 46.4% of them maintained dental records for less than 2 years, 40.5% for 2-5 years and 13.1% for more than 5 years. Among M.D.S dental practitioners 22.9% maintained dental records for less than 2 years, 51.4% for 2-5 years and 25.7% for more than 5 years (Table no.2). 98.4% of B.D.S and 90% of M.D.S dental practitioners said that their knowledge level/ awareness regarding forensic odontology were perceived to be inadequate. 77% of B.D.S and 66% of M.D.S dental practitioners did not know the relevance of maintaining dental records for identification of criminals and dead-bodies. 80% B.D.S and 68% M.D.S dental practitioners were not aware that dentist can present forensic dental evidence in the court as an expert witness. 93.4% of B.D.S and 93.4% of M.D.S dental practitioners were never been called by authority/court for forensic dental evidence. 96.7% of B.D.S and 95.9% M.D.S dental practitioners were not confident in handling forensic dentistry-related cases. Only 6.6% of B.D.S and 6.6% of M.D.S dental practitioners had handled forensic dentistry related cases before.

21.7% of B.D.S dental practitioners and 31.6% of M.D.S dental practitioners said that they know they have a role in identifying deceased in the incident of mass fatality. 84.1% of B.D.S dental practitioners and 93.3% of M.D.S dental

Table No.1: Questions assessing the knowledge, attitude and practice of forensic odontology.

| QUESTIONS | B.D.S | | M.D.S | |
|--|-------|-------|-------|-------|
| | Yes | No | Yes | No |
| Do you maintain dental records in your clinic? | 11% | 89% | 23% | 77% |
| Do you know that you can present forensic dental evidence in the court as an expert witness? | 20% | 80% | 32% | 68% |
| Do you know the relevance of dental records in recognising the dead and accused criminal? | 23% | 77% | 34% | 66% |
| Do you have knowledge about bite mark patterns of teeth? | 76% | 24% | 84% | 16% |
| Had you been called by authority/court for forensic evidence related? | 6.6% | 93.4% | 6.6% | 93.4% |
| Do you think you have a crucial role in identifying deceased in the incident of mass fatality? | 21.7% | 78.3% | 31.6% | 68.4% |
| Are you confident in handling forensic dentistry-related cases? | 3.3% | 96.7% | 4.1% | 95.9% |
| Can you estimate the dental age of an individual by examining the teeth? | 84.1% | 15.9% | 93.3% | 6.7% |
| Do you think your present knowledge level/ awareness about forensic dentistry is adequate? | 1.6% | 98.4% | 10% | 90% |
| Can you identify indicators of domestic violence and child abuse? | 80.3% | 26.7% | 82.5% | 17.5% |
| Have you handled any forensic dentistry related cases before? | 6.6% | 93.4% | 6.6% | 93.4% |
| Have you been trained about forensic dentistry during your education period? | 6.6% | 93.4% | 4.1% | 95.9% |
| Are you a part of forensic team in your city? | 0 | 100% | 1.6% | 98.4% |

Table No. 2: Duration of maintenance of dental records by dental practitioners

| QUESTION | Education | < 2 years | 2-5 years | >5years |
|---|-----------|-----------|-----------|---------|
| For how long you maintain dental records? | B.D.S | 46.4% | 40.5% | 13.1% |
| | M.D.S | 22.9% | 51.4% | 25.7% |

Table No.3: Modes of knowledge update by dental practitioners

| QUESTION | Education | Specialised P.G course | Workshops | CDE/ Conference | Journal Books Internet |
|---|-----------|------------------------|-----------|-----------------|------------------------|
| How do you upgrade your knowledge related to forensic dentistry | B.D.S | 4.1% | 14.1% | 18.3% | 63.5% |
| | M.D.S | 15.0% | 22.5% | 33.6% | 28.8% |

practitioners said that they can estimate the dental age of an individual by examining the teeth. 80.3% of B.D.S dental practitioners and 82.5% of M.D.S dental practitioners could identify indicators of domestic violence and child abuse. 76% of B.D.S dental practitioners and 84% of M.D.S dental practitioners were aware of bite marks pattern.

B.D.S dental practitioners upgrade their knowledge related to forensic dentistry by (Table No. 3) Journal / Books / Internet (63.5%), CDE/Conference (18.3%), Workshops (14.1%), Specialised P.G course (4.1%) while M.D.S dental practitioners upgrade their knowledge related to forensic dentistry through CDE/Conference (33.6%), Workshops (22.5%), Journal / Books / Internet (28.8%), Specialised P.G course (15%).

Only 6.6% of B.D.S dental practitioners and 4.1% of M.D.S dental practitioners had been trained about forensic dentistry during their education period. None of the B.D.S dental practitioners were part of the forensic team of the city. Only 1.6% of M.D.S dental practitioners were part of the forensic team.

DISCUSSION

Each person is worthy enough to retain the pride of their identity after death as well. Even though there are abundant acknowledged scientific identification methods, the proficiency of forensic odontologists is still a prerequisite. Being diverse and resistant to environmental challenges, teeth are well thought out to be excellent post-mortem material for identification with enough concordant points to make a meaningful comparison.⁵ Furthermore; most restorative materials used by dentist are also resistant to post mortem destruction to certain extent. ⁶

Scope of forensic odontology is wide and it includes identification of suspects in criminal investigations, suspected child or adult abuse, bite marks or physical injuries, determination of age and gender of the living or deceased person, presenting forensic dental evidence as an expert witness in the court and human identification through human remains that are decomposed

and mutilated in mass disasters. The fruit for success of identification lies in accessibility and precision of record compilation and maintenance.

In our study M.D.S dental practitioners presented better level of knowledge and awareness about forensic odontology than B.D.S dental practitioners. Reason could be justified as majority of B.D.S dental practitioners upgrade their knowledge related to forensic dentistry by Books and Internet while M.D.S dental practitioners upgrade their knowledge through CDE, Conferences, Journals, and Workshops which are more updated sources.

According to British Medical Association, “An expert witness is a person who is qualified by his or her knowledge or experience to give an opinion on a particular issue(s) to a court.” Based on the evaluation of the dental investigations, dentist can provide his viewpoint to the lawyer to solve criminal cases. In our study majority of dental practitioners were not aware that they can present forensic dental evidence and hence they were not confident enough in handling forensic dentistry-related cases.

Dentist has a role in identifying deceased in case of mass catastrophe as they can aid in issuing death certificate which helps in claiming the insurance, settlement of property, facilitate remarriage of a surviving spouse and allows last ritual of the body. Identifying feature include displaced / rotated teeth, restorations, carious tooth, missing teeth, occupational or habit-created wear facets, fractured teeth, diastema, prosthodontic appliances, extent of shovelling of the maxillary incisors, presence and angulation of impacted teeth, dental anomalies, intrinsic staining and bone level present. Sex of a person can be identified by finding out Barr bodies and Y-chromosomes in dental pulp. However, in our study only 21.7% of B.D.S and 31.6% of M.D.S knew the role of dentist in the event of mass disaster.

There is a need for maintaining the records officially and professionally to protect against any commercial, legal, and medico-legal litigation.⁷ Indian law says Under Article 51 A(h) of the Constitution of India, there is a moral

obligation on the doctor and a legal duty, to maintain and preserve medical, medico-legal, and legal documents in the best interests of social and professional justice.⁴ Results of our study suggested that only few of the dental practitioners maintain records and for more than 5 years. These findings were similar when compared with findings of the study conducted by Preeti S (2011)³ and Madhusudan Astekar (2011)⁸. Dental practitioners of our study reported that they maintain records for follow-up, reference and maintaining the patient's appointment schedule, not for sole purpose of forensic.

For age estimation, the investigator is concerned with the person's degree of maturity. Age of a child can be identified by comparing eruption of primary and permanent teeth against the person's chronological age. Eruption of third molar, periodontal disease progression, tooth wear, multiple restorations, extractions, bone pathologies and complex restorative work could provide a clue about an older individual age. These markers have an accuracy of $\pm 10-12$ years.⁹ In 2009 Druid et al.¹⁰ proposed combining aspartic acid racemization analysis and enamel uptake of Radioactive Carbon-14 studies to provide age of unidentified body cases with more useful information. In our study both B.D.S and M.D.S dental practitioners were confident enough in estimating the age of children, teenagers and adolescents but not for adults and older people.

Dental clinicians, as other healthcare professionals are at the forefront in spotting signs of violence appearing on their patients. The dentist should be aware of child, elderly or spousal abuse and bite marks when confronted with unusual oral injuries, especially in cases of persons with accompanying body injuries.¹¹ Abusive trauma to the face and mouth includes fractured anterior teeth, missing or displaced teeth, fractures of the maxilla and mandible, laceration of labial frenum, bruised or scarred lips, face and neck. Kenney and Clark have cited numerous researches that suggest approximately 50% of injury in child abuse cases occur in the oral and perioral region.¹² Dentist should be able to distinguish the injury caused by bites through arch alignments and specific tooth morphology. From legal point of view, matching of bite marks produced on human tissues to a suspect's dentition may enable law enforcers to implicate the suspect in the crime case. Majority of dental practitioners of our study were confident in identifying domestic violence, child abuse and bite marks among their patients, but when asked about reporting to any authority on identification of abuse, none of them had reported to any authority.

Dentists should be aware of the legal impact of such cases and should refer them to the

appropriate authorities for suitable action. Photographs and radiographs of the injury or injuries are often helpful to document injuries. Some laws penalize healthcare workers by imprisonment, and/or fines, for not reporting violence manifested on their patients.¹³ 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.¹⁴

CONCLUSION

The results of our study suggest that in Ghaziabad city 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. It indicates that these dentists are not at all prepared for any kind of forensic and medico legal needs, be it for cases of consumer forum, civil or criminal litigation. The overall quality of record-keeping was poor in line with the records findings of other worldwide studies. It can be improved by introducing forensic odontology as subject in dental curriculum at both undergraduates and postgraduates levels. Institutions should offer formal training in forensic odontology. Consistent upgrading knowledge of dental practitioners and students through periodic CDE Program, Workshops and Conferences is obligatory.

REFERENCE

1. Acharya AB, Sivapathasundharan B. Forensic Odontology. Shafer's Textbook of Oral Pathology 5th Ed. Elsevier 2006;1199-227.
2. Sansare K. Forensic odontology, historical perspective. Indian J Dent Res 1995;6:55-7.
3. Preethi S, Eintein A, Sivapathasundaram B. Awareness of forensic odontology among dental practitioners in Chennai: A knowledge, attitude, practice study. J Forensic Dent Sci 2011;3: 63-6.
4. Maintenance of Records. Available from: http://www.ida.org.in/Dental_Practice_Accreditation/maintenance_of_records.htm.
5. Dr. Suhail Hani Al-Amad. Forensic Odontology. Smile Dent Journal 2009; 4(1): 22-4.
6. Manjunath K, Sivapathasundharan B, Saraswathi T R. Efficacy of various materials in recording enamel rod endings on tooth surface for personal identification. J Forensic Dent Sci 2011;3:71-6
7. Dhawan R, Dhawan S. Legal aspects in dentistry. J Indian Soc Periodontol 2010;14:81-4.
8. Astekar M, Saawarn S, Ramesh G, Saawarn N. Maintaining dental records: Are we ready for forensic needs? Journal Forensic Dent Sci, 2011;3(2):52-7.
9. Pretty IA, Sweet D. A look at forensic dentistry - Part 1: The role of teeth in the determination of human identity. Br Dent J 2001;190:359-6.

10. Druid. H, K. Spalding, and B. Buchholz. Dead victim identification: Age determination by analysis of bomb-pulse radiocarbon in tooth enamel. Denver: American Academy of Forensic Sciences. Proceedings 2009;15.
11. Avon SL. Forensic odontology: the roles and responsibilities of the dentist. J Can Dent Assoc 2004; 70(7):453-8.
12. Acharya AB, Sivapathasundhararn B. Forensic Odontology. Shafer's Textbook of Oral Pathology 5th Ed. Elsevier 2006;1219.
13. Government of Dubai. Article 273 Federal Penalties Law of the UAE Number 3. 1987. Available at:URL:<http://www.dc.gov.ae>. Accessed 12 Nov. 2014
14. Sfikas PM. Does the dentist have an ethical duty to report child abuse? J Am Dent Assoc 1996;127:521-3.

How to cite this Article: Sharma A, Shokeen S, Arora R, Dhaginakatti SA. Survey on knowledge, attitude and practice forensic odontology among private dental practitioners in Ghaziabad city, India. J Dent Specialities,2015;3(1):43-47

Source of Support: NIL

Conflict of Interest: None Declared