ORIGINAL ARTICLE

Antemortem dental records versus individual identification

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Abstract

Background: Forensic odontology plays a pivotal role in the identification of victims in mass disasters utilizing "preserved dental records" or "ante-mortem records" available with the general dental practitioners. Identification of a deceased individual by comparing antemortem and postmortem records is more reliable and easier as compared to other methods. However, in India, the practice of maintaining dental case record requires additional emphasis. **Aim:** The aim of the present study is to assess the knowledge, attitude, and practices of dental practitioners in South India regarding awareness and importance of maintaining patient's dental records. **Settings and Design:** A descriptive questionnaire study was conducted among the alumni of the dental institution over a period of 3 months. The alumni who passed out from 2000 to 2015 were included in the study. **Materials and Methods:** A structured questionnaire containing 24 questions regarding the knowledge, attitude, and practice of maintaining clinical case records was prepared and validated. Data were collected from 543 dental practitioners from various parts of South India who were the alumni of the dental institution. **Statistical Analysis:** The data were summarized and analyzed using the statistical software Statistical Package for the Social Sciences. The descriptive analysis was done in percentages, and the results were tabulated. **Results:** Overall, 58.39% of dentists were found to be maintaining records promptly, and 84.6% dentists have knowledge about forensic odontology, but only 8.4% of dentists have helped the government agencies during mass disasters. **Conclusion:** This study reveals that the need of the hour is to change the attitude and to cultivate interest among practicing dentists regarding dental record maintenance which can tremendously help in the deceased individual identification process.

Key words: Dental records, forensic odontology, general dental practitioners, mass disasters

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Introduction

Forensic odontology is a branch which connects dentistry and the legal profession.[1] It helps in the identification of individuals who are difficult to be recognized visually or in case of absence of fingerprints, personal effects, and others due to disastrous accidents.[2] A dental record is a

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legal document that contains all subjective and objective information about the patient, and it is in the possession of the dentist.[3] The dental record is a document that contains the patient's chief complaint, the history of illness and associated systemic illness, clinical examination, dental charts, diagnosis, investigations, the treatment done, and notes on subsequent follow-up(s).[3] Maintaining dental records are legally compulsory in the European and American countries; however, in India, there is shear unawareness regarding the same.[4] The ability of clinical practitioners to produce and maintain accurate dental records is essential for good quality patient care as well as it being a legal obligation, thus extending aid in forensics. For becoming future ready, it is very important to know the current status of dental records available at the general dental practitioners. The aim of the present study is to assess the knowledge, attitude, and practices of dental practitioners in various parts of South India regarding awareness and importance of maintaining patient's dental records.

Materials and Methods

A survey questionnaire was prepared.[5-9] An ethical clearance was obtained from the Institutional Review Board. The questionnaire was validated by conducting a pilot study as well as by obtaining expert academician's opinions. The 24 questions were grouped under 12 sections [Table 1]. The most favorable option is chosen for each question by the investigator.

Only those dentists who were alumni of the respective dental institution from 2000 to 2015 were included in the study. The dentists who were indulged in clinical practice with a minimum of 1-year experience are only included in the study. The dentists who do not have a clinical practice were excluded from the study.

The study was carried out over a period of 3 months. The whole list of the alumni from 2000 to 2015 was obtained from the respective institution. The entire alumni list was divided into four categories based on the State in which the respective dentist was practicing. The four categories were as follows: dentists from Tamil Nadu, dentists from Kerala, dentists from Karnataka, and dentists from Andhra Pradesh. All these four categories were divided into a group of 10; and from each group, every 3rd, 5th, and 7th member was selected. A total of 570 dentists were selected after the block randomization out of which 145 dentists were from Tamil Nadu, 141 dentists were from Kerala, 140 dentists were from Karnataka, and 144 dentists were from Andhra Pradesh. A common E-mail ID was created without disclosing the identity of the investigator, and the questionnaire was sent to all the 570 dental practitioners.

Table 1: Summary of the results showing percentage of response to each question

Type of question	Question number	Percentage for each response				
		Option A	Option B	Option C	Option D	No response
Years of practice	1	72.5	16.2	11.3	NA	NA
Knowledge and current status of clinical case record maintenance	2	76.2	22.4	NA	NA	1.4
	3	40.6	33.6	25.9	NA	NA
	4	89.5	9.8	NA	NA	0.7
	5	66.4	30.8	NA	NA	2.8
	6	0.7	69.9	21.0	4.2	4.2
Details of the patient	7	97.9	2.1	NA	NA	NA
Format of recording case history	8	53.1	25.9	15.4	4.9	0.7
	9	33.6	15.4	50.3	NA	0.7
Recording additional findings	10	89.5	10.5	NA	NA	NA
Radiographic records	11	57.3	42.7	NA	NA	NA
	12	73.4	26.6	NA	NA	NA
	13	30.8	21.7	35.0	12.6	NA
Additional procedures mentioned	14	85.3	14.7	NA	NA	NA
	15	55.9	44.1	NA	NA	NA
	16	62.9	37.1	NA	NA	NA
	17	38.5	19.6	42.0	NA	NA
Preservation of records	18	67.8	18.2	12.6	NA	1.4
	19	4.2	10.5	24.5	57.3	3.5
Updating the records	20	66.4	7.0	25.9	NA	0.7
Participation in forensic issues	21	8.4	91.6	NA	NA	NA
Opinion on case record maintenance	22	89.5	9.8	NA	NA	0.7
	23	97.2	1.4	NA	NA	1.4
Knowledge about forensic odontology	24	84.6	15.4	NA	NA	NA

NA: Not available

Only 543 dentists responded to the questionnaire. Eight dentists from Tamil Nadu, seven dentists from Kerala, five dentists from Karnataka, and seven dentists from Andhra Pradesh did not respond to the questionnaire as they were not practicing clinically.

Statistical analysis

The data were summarized using the statistical software - Statistical Package for the Social Sciences version 17.0 (IBM, Armonk, NY, United States of America). The data were descriptively analyzed with the help of percentages, and the results were tabulated.

Results

The results are summarized in Table 1.

72.5% of the dental practitioners who participated in the study have only 1–5 years of experience whereas 16.2% have 5–10 years of experience and 11.3% of the dentists have more than 10 years of experience.

22.4% of the dental practitioners answered that they have not been taught about maintaining dental records at institutional level. 40.6% of the dentists are maintaining file records in their clinic by date whereas 33.6% are maintaining their records using serial number and 25.9% of the dental practitioners use software for record maintenance.

89.5% of the dental practitioners responded that their office staffs were able to locate the files easily. 66.4% of the dental practitioners maintain a chronological order of the recorded data whereas 30.8% do not and 2.8% of the dental practitioners did not respond to this question. 69.9% of the dental practitioners keep record of the dates during every visit of the patient whereas 21% of the dentists keep records of the dates only when a procedure or treatment is done, 0.7% of the dentists keep record of the dates only on patients first dental visit and 4.2% of them do not keep record of the dates at all, 4.2% of the dental practitioners chose not to answer this question.

97.9% of the dental practitioners mention the name, age, gender, phone number, and address of the patient in the clinical case record whereas 2.1% of the dentists do not record them.

53.1% of the general dental practitioners use manually preprinted forms for recording case history whereas 25.9% of the dentists use manually blank pages. 15. 4% of the dentists record the case history digitally while 4.9% of the dental practitioners do not record case history at all. 0.7% of the dentists did not respond to this question. 50.3% of the dentists use Federation Dentaire Internationale (FDI) system for recording the tooth number in case records while 33.6% use Zsigmondy Palmer Notation System. The universal notation system is used by 15.4% of the dental practitioners. 0.7% did not respond to this question.

89.5% of the dental practitioners record additional findings (e.g., Tori, peg and laterals) in their clinical case records whereas 10.5% do not.

57.3% of the dentists take radiographs in conventional method in their clinics whereas 42.7% record the radiographs digitally. 73.4% of the dental practitioners mention the findings of the radiographs in their clinical case records whereas 26.6% do not. 35% of dental practitioners handover the radiographs to the patients whereas 30.8% retain the radiograph as hard copy. Only 21.7% of the dentists retain the radiographs as soft copy. 12.6% of the dental practitioners give one copy of the radiograph to the patient and retain one copy with them.

85.3% of the dental practitioners keep a record of every treatment done while 14.7% of the dental practitioners do not. 55.9% of the dental practitioners take photographs of the patient for record purposes whereas 44.1% do not. 62.9% of the dental practitioners mention the prescribed medication in the patient's case file whereas 37.1% do not.

Only 38.5% of the dentists take written informed consent signed by the patient while 19.6% does not take consent at all from the patients. 42% dentists admitted that they take consent only for some patients.

67.8% of the dentists preserve the dental file after treatment whereas 18.2% handover the original record to the patient. A copy of the record is hand over to the patient by 12.6% of general dental practitioners. 1.4% of the dentists did not respond to this question.

57.3% of the dentists preserve the case records permanently while 24.5% preserve them for a few years, 10.5% for few months, 4.2% for few days, and 3.5% chose not to answer this question.

66.4% of the dental practitioners update the case records in patient's subsequent visits whereas 25.9% do not update at all. 7% of the dentists update records only when a treatment procedure is done, and 0.7% of the dental practitioners did not respond to this question.

Only 8.4% of the dental practitioners shared their patient dental records with the government agencies during mass disasters.

89.5% of the dental practitioners maintain records in their private practice. 0.7% did not respond to this question. 97.2% of the dentists gave the opinion that maintaining patient records is important in a dental clinic while 1.4% of the dentists chose not to answer this question.

84.6% of the dental practitioners are aware about forensic odontology and its importance in individual identification.

From the above-mentioned results, the most favorable responses are evaluated [Table 2 and Figure 1], and the authors came to the conclusion that about 58.39% of the dentists are maintaining records properly in their practice whereas 41.61% are not maintaining the records properly [Figure 2].

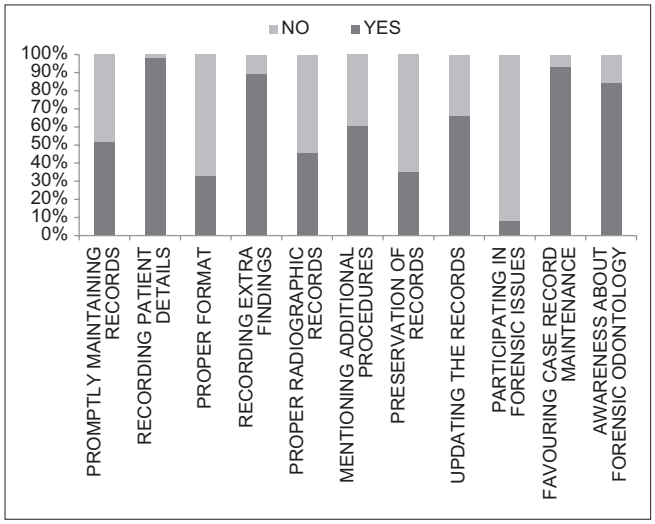

Figure 1: Bar chart showing the comparison of most favorable response with aggregate of other responses

Discussion

The most common element of forensic dentistry that a general practitioner is likely to encounter is to supply antemortem records to a forensic odontologist. Hence, the production, retention, and release of clear and accurate patient records are an essential part of the dentist's professional responsibility. Hence, this study was undertaken to assess the knowledge and awareness regarding record maintenance and its importance in forensic among dental practitioners.[10]

On review of scientific literature, it shows many questionnaire surveys conducted by various authors in India. However, most of the studies were conducted in

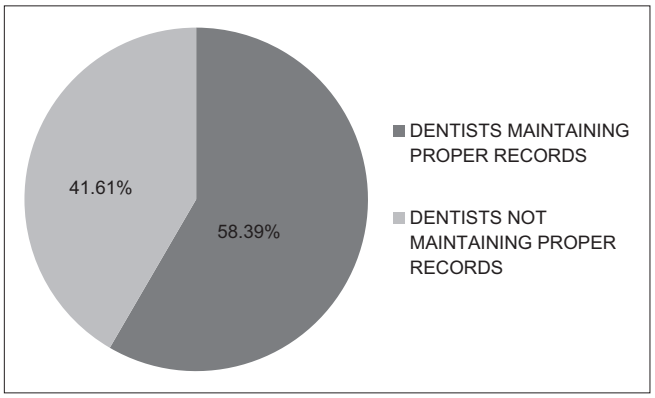

Figure 2: Pie chart showing the overall result of the study

Table 2: Most favorable response in each question and the overall favorable percentage

Question number	Type of question	Most favourable response	Percentage	Overall percentage
2	Knowledge and current status of clinical case record maintenance	A	76.2	51.61
3		C	25.9	
4		A	89.5	
5		A	66.4	
6		B	69.9	
7	Details of the patient	A	97.9	
8	Format of recording case history	C	15.4	32.85
9		C	50.3	
10	Recording extra findings	A	89.5	
11	Radiographic records	B	42.7	45.93
12		A	73.4	
13		B	21.7	
14	Additional procedures mentioned	A	85.3	60.65
15		A	55.9	
16		A	62.9	
17		A	38.5	
18	Preservation of records	C	12.6	34.95
19		D	57.3	
20	Updating the records	A	66.4	
21	Participation in forensic issues	A	8.4	
22	Opinion on case record maintenance	A	89.5	93.35
23		A	97.2	
24	Knowledge about forensic odontology	A	84.6	

the northern and western parts of the country. The studies conducted in southern part of India mostly concentrated on the metropolitan cities. This study is the first of its kind which concentrated on both rural and urban areas of Kerala, Tamil Nadu, Karnataka, Telangana, and Andhra Pradesh.

Studies by Astekar, *et al*. in Rajasthan and by Gupta *et al*. in Punjab and UP showed that only 38% and 22% of the dental practitioners, respectively, are maintaining records properly[11,12] which is very much less when compared to the present study. One of the studies conducted in Chennai, Tamil Nadu by Preethi, *et al*. also yielded similar results to the present study such as poor attitude and lack of practice among the dental practitioners in Chennai, but this study concluded that the practitioners had inadequate knowledge[13] which is not in accordance with the present study. Studies by Ramesh *et al*., in Kanpur and by Sahni *et al*. in Delhi concluded that the dental practitioners have sufficient knowledge regarding forensic odontology but what lacks is the attitude and interest among them.[2,10] These results are also in accordance with the present study because in this study, the dental practitioners have high awareness regarding the importance of antemortem dental records in individual identification but still lack the attitude for maintenance.

Many international questionnaire surveys were also conducted regarding the same topic. One study done by Dierickx, *et al*. in Belgium concluded young dentists maintain records properly than the experienced practitioners.[14] A study conducted by Al-Azri, *et al*. in Australia concluded that dental practitioners in Australia have reasonable awareness regarding the antemortem record maintenance[15] which is similar to the result obtained from the present study.

One of the measures that can be done to improve the maintenance of antemortem dental records is introducing a new "dental card" for the citizens of the country, and this card should be linked with the existing identity cards (e.g., Aadhar cards in India) so that it is easy to find the details of the deceased person. This dental card must be maintained under a central database and it will be very helpful in cases of mass disasters (e.g., in cases of air accidents or train accidents, if the deceased person has booked the tickets with Aadhar card as ID proof, it will be very easy to trace the dental card and the antemortem dental details which can finally help in deceased individual identification). The dental card can be updated every 6 months with the help of dentists posted in the Primary Health Centers (PHCs). More dentists must be appointed in the PHCs for this purpose.

Conclusion

The present survey revealed the current status of antemortem dental case record maintenance and knowledge about the uses of these records in forensic odontology in the southern part of India. It revealed that there is low maintenance of case records. Adequate knowledge is observed among the dental practitioners, but they lack the attitude and interest in the application of that knowledge. More measures must be taken to improve this condition like the maintenance of dental cards, the introduction of forensic odontology as a subject for both undergraduates and postgraduates, conducting more workshops and conferences in forensic odontology or else this field will remain as an infant.

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Conflicts of interest
There are no conflicts of interest.

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Questionnaire

Questionnaire: Questionnaire for the study

1. Please specify your years of experience in dental practice
   a. 1–5 years
   b. 5–10 years
   c. More than 10 years
2. Have you been taught about maintaining dental records at institutional levels (Under Graduate and Post Graduate curriculum)?
   a. Yes
   b. No
3. How do you sort clinical/patient records in your clinic?
   a. By date (manually)
   b. By serial number (manually)
   c. Using software
4. Can your dental office staff locate the case files easily?
   a. Yes
   b. No
5. Are the recorded data maintained in a chronological order in your dental clinic?
   a. Yes
   b. No
6. Do you keep record of the dates in clinical/patient files?
   a. Only on patients first visit
   b. During every visit of the patient
   c. Only when procedures or treatments are done
   d. Never
7. Has name, age, gender, and contact details of the patient been mentioned in the clinical case record?
   a. Yes
   b. No
8. How do you record the case history?
   a. Manually preprinted forms
   b. Manually blank page
   c. Digitally
   d. Does not record at all
9. Which tooth numbering system do you use?
   a. Zsigmondy – palmer notation
   b. Universal notation
   c. Federation dentaire international notation
10. Apart from patient's chief complaint, do you mention any additional abnormalities/normal variations?
    a. Yes
    b. No
11. Mention the type of radiographs you routinely take
    a. Conventional
    b. Digital
12. Do you incorporate the findings of the radiographs in the case record form?
    a. Yes
    b. No
13. How do you handle the patient's radiographs after the treatment?
    a. Retain the radiograph as hard copy
    b. Retain the radiograph as soft copy
    c. Handover the radiograph to the patient
    d. Hard copy handover to the patient and the soft copy is retained
14. Do you record every treatment that was done to the patient?
    a. Yes
    b. No
15. Do you take photographs of the patient for the record purpose?
    a. Yes
    b. No
16. Do you mention the prescribed medication in the clinical file?
    a. Yes
    b. No
17. Do you take a written informed consent signed by the patient?
    a. Yes
    b. No
    c. For some patients only
18. How do you handle the patient's dental file after the treatment?
    a. Preserve the dental file
    b. Handover the original record to the patient
    c. Handover a copy of the record to the patient
19. How long the preserved dental records are retained in your dental clinic?
    a. Few days
    b. Few months
    c. Few years
    d. Permanently
20. Do you update the clinical case records in patient's subsequent visits?
    a. Yes
    b. Only when a treatment procedure is done
    c. No
21. Have you ever shared patient dental records with any government agencies during the incidence of mass disasters?
    a. Yes
    b. No
22. Do you maintain patient records in a proper way in your clinic?
    a. Yes
    b. No
23. Do you think maintaining patient record is important in a dental clinic?
    a. Yes
    b. No
24. Are you aware about forensic odontology and its importance in individual identification?
    a. Yes
    b. No