ORIGINAL ARTICLE

# PERCEPTION OF FORENSIC ODONTOLOGY AMONG THE DENTAL PRACTITIONERS OF PESHAWAR; A QUESTIONNAIRE BASED STUDY

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**ABSTRACT**

*The aim of the study was to evaluate the awareness and practice of Forensic Odontology among the dental surgeons of Peshawar in May 2018. A cross –sectional descriptive study was conducted over 200 dental practitioners of Peshawar through questionnaire comprising of eight close ended questions. The questionnaire was pretested by 15 dentists twice on consecutive days. Data were analyzed through descriptive statistics using SPSS. Knowledge and practice of Forensic Odontology was found to be deficient while positive attitude was seen towards adoption of Forensic Odontology as a subject in dental curriculum. Forensic Odontology has been deprived of its due importance in this part of the world. The subject yet requires much recognition.*

**Key Words:** *Forensic Odontology, Forensic Dentistry, questionnaire, Peshawar, teeth, identification, age estimation, gender discrimination, ante-mortem, post-mortem, records, racial determination.*

## INTRODUCTION

Teeth, since long, have been used for identification purposes. The first case in history that has been registered in court of law dates back to 1849.[1] Forensic Odontology is a part of forensic science that aims to reveal the truth. The word 'forensic' comes from a Latin word forum, that means court of law and 'odontology' refers to the study of teeth. In simple terms, it is the application of dentistry in the legal proceedings. It has been defined by Federation Dentaire International (FDI) as, "branch of dentistry which deals with proper handling, examination and evaluation of dental evidence in the interest of justice.[2] This branch involves human identification, bite marks analysis, assessment of cases of abuse ( child/ spousal/ elder) and assessment of medicolegal cases.[3]

Forensic Dentists works zealously to identify the found human remains. Human identification can be made by comparing postmortem data with patient's ante mortem dental records (including dental casts, cinematographic records and X-rays).[4] In the absence of ante mortem data, post mortem dental profiling is being carried out through forensic anthropology to determine an individual's age, ancestry background, gender and socioeconomic status.[5] It may also reflect over a person's profession, dietary routine or any dental/ systemic disease.[6] The changes observed in mandible and teeth over the time and the variations in the ratio of D and L aspartic acid in dentine, help determine the relative age of an individual. Tooth morphology and shape of palate are of particular interest in racial determination. Sex determination focuses on cranial appearance, mandibular morphology and to a lesser extent mandibular canine index and cheiloscopy (study of the lip prints). Microscopic examination for presence of y chromatin also determines sex of individual.[7-8] The palatal Rugae pattern, facial reconstruction and Maxillary sinus measurements by special computer software using 3D computer tomography scans can now be used in computer and digital forensics[9].

The reason that teeth and other dental tissues play important role in the field of forensic science could be explained briefly through following

1. Firstly, teeth and supporting structures follow a predictable pattern of aging
2. Teeth shows some characteristic features that can be used in comparative identification.
3. Enamel is the hardest tissue of body, hence, it can better tolerate trauma of desiccation, water emersion, burn and chemical erosion, better than any other tissue of the body.
4. The dental pulp is a good source of DNA as being protected by enamel[10].

At present, the world recognizes and has accepted forensic odontology as an established subject. Unfortunately in Pakistan, forensic dentistry still requires

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much recognition as it is only included as a topic in the dental curriculum and yet not as a subject.

The aim of the study was to evaluate the awareness and practice of the subject by the dental surgeons in hospitals and private clinics of provincial metropolis of Khyber Pakhtunkhwa.

## MATERIALS AND METHODS

After the approval from institution's ethical committee, a cross sectional descriptive study was conducted in both government dental college (Khyber College of Dentistry), private dental colleges (Peshawar Dental College, Sardar Begum Dental College) and at private clinics through questionnaire. The questionnaire was written in English language and the validity was checked through a pilot survey. It included eight close ended questions. The perception of Forensic Odontology among dentists was checked by enquiring about the significance of dental record keeping, gender and race identification, significance of Rugae pattern and tooth as a source of DNA. Questions related to the perception and practice of dentists in medicolegal cases were also included. Dentists were asked if they agree to the adoption of forensic odontology as a subject in the dental curriculum. A single investigator visited all the practitioners and the willing dentists were asked to fill the consent form and the questionnaire. Equal distribution of questionnaires among the public and private sector was ensured. All the information was kept confidential.

### *Pretesting of the questionnaire*

Questionnaire of 8 questions were administered to a panel of three academician and a convenience sample of 15 dentists twice on successive days who were interviewed to gain feedback on the overall acceptability of the questionnaire in terms of length, language clarity, time, and feasibility of dentists completing and returning it. Based on the opinions expressed a mean Content Validity Ratio (CVR) of 0.89 among academicians and Cronbach's coefficient of 0.76 in dentists was found. Face validity was also assessed and it was observed that 93% of the participants found the questionnaire to be easy.

### *Statistical Analysis*

The data was analyzed through the Statistical Package for Social Sciences version 20.0 software (SPSS Inc, Chicago, IL, USA). The response of questionnaire was analyzed through descriptive statistics.

## RESULTS

The study included 200 participants among which 38.7 % were females and 61.3 % were male practitioners. The mean age found was 30 years with minimum of 25 years and maximum age of 56 years. 91.3 % of practitioners appreciated the significance of dental record keeping. Only 30% agreed to the fact they could identify the gender of individual through teeth while 25% admitted of ascertaining race. 31.3% knew about the characteristic Rugae pattern specific for individuals. 57.5% of practitioners considered tooth as a good source of DNA. 51.3 % knew that they could be called any time by the court of law. 72.5% of practitioners had never been under any sort of training in collecting, evaluating and presenting dental evidence. 83.8 percent agreed on adoption of Forensic Odontology as a subject in dental curriculum (table 1)

## DISCUSSION

Forensic Odontology deals with the use of dentistry in legal proceedings. Globally, the emphasis on this

TABLE 1: RESPONSE OF QUESTIONNAIRE RELATED TO PERCEPTION OF FORENSIC ODOTOLOGY AMONG DENTAL PRACTITIONERS OF METROPOLIS OF KPK, PAKISTAN.

| | Questions | Yes (%) | No (%) | Don't know (%) |
|---|---|---|---|---|
| 1 | Do you appreciate the significance of keeping dental record for identifying deceased and crime suspects | 91.3 | 7.5 | 1 |
| 2 | Can you ascertain gender of individual through teeth | 30 | 42.5 | 27.5 |
| 3 | Have you tried or support the idea of identifying the race of an individual as a dentist? | 25 | 60 | 15 |
| 4 | Do you know Rugae pattern is peculiar and specific for individuals? | 31.3 | 41.3 | 27.5 |
| 5 | Do you think tooth is a good source for extraction of DNA? | 57.5 | 10 | 32.5 |
| 6 | Do you think you can be called any time by the court of law as an expert witness in dental evidence? | 51.3 | 27.5 | 21.3 |
| 7 | Have you ever had any training in collecting, evaluating and presenting dental evidence? | 26.3 | 72.5 | 1.3 |
| 8 | Do you think Forensic Odontology be adopted as a subject? | 83.8 | 10 | 6.3 |

subject has been increased with the increase in crime rate, terrorism and mass disasters. Forensic dentists most commonly work for the identification of mutilated bodies of victims that are difficult for recognition by family members as in disaster victim identification (DVI).[11] Major role of the subject has been found in identifying victims of Indian Ocean Tsunami of 2004[12] and incident of 9/11[13]. Ted Bundy, the famous serial killer of America, has been identified through his bite-marks[14]. John Wike Booth[15] (person who assassinated President Abraham Lincoln) and the bodies of Adolf Hitler[16] and General Zia ul Haq[17] (the ex-President of Pakistan) were identified through dental means.

As more male practitioners work in private clinics as compared to female practitioners, the study included more males. This study showed that high number of dental practitioners realize about the importance of subject by appreciating the importance of dental record keeping. A small percent of the practitioners could ascertain the gender of an individual. 60% did not support the idea of identifying race of an individual as a dentist. This shows the lack of knowledge over the subject. Although the major portion of the practitioners realize that they could be called anytime in the court of law as an expert witness in dental evidence but had never collected or presented dental evidence. A similar lack of knowledge has also been found in the metropolis city (Karachi) of another province of the country.[18] A study conducted in Rawalpindi-Islamabad showed both lack of knowledge and practice in Forensic Odontology among dental practitioners.[19] Across the border, however, an Indian study showed better knowledge of the subject among practitioners.[20,21]

This challenging field has been deprived of its due importance in this part of the world. We highly suggest to carry out further studies in this field in Pakistan.

## CONCLUSION

Forensic Odontology has been deprived of its due importance. The knowledge and practice has been found to be deficient while practitioners had positive approach towards adoption of Forensic Odontology as a subject in dental curriculum.

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| **3 Mansoor Alam:** | Compiled data and configured results. |
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