G14 A Study of Non-Metric Dental Traits of a North Indian Population: Forensic Aspects

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Learning Overview: After attending this presentation, attendees will understand the usefulness of non-metric characteristics of the teeth in the identification of individuals and in forensic examinations, especially with reference to sexual dimorphism and ethnicity.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by presenting the utility of morphological characteristics of the teeth in the identification of human remains, especially in a genetically disparate population.

Teeth are the hardest part of the body and can withstand even the most extreme situations, such as very high temperatures, corrosion, fire, putrefaction and decomposition, explosions and thermal trauma, as compared to the other elements of the human skeleton. Therefore, in these situations, the teeth are the most available and favored skeletal elements for the identification of the unknown human remains. Basically, there are two methods by which the teeth could be used in the identification process. The first method involves a comparison of Antemortem (AM) and Postmortem (PM) dental records of the deceased. The second method deals with making a PM dental profile in which the individualistic features of the teeth are recorded, which can ultimately help in narrowing the possible victim matches in the investigation process. The present study focuses on the variations in the morphological characteristics of the teeth, which may not only help in establishing the uniqueness and identity of the deceased in forensic examinations after comparing the AM and PM records, but also may help to estimate the sex and ethnicity/ancestry of the deceased.

The present study was conducted to examine the non-metric and morphological traits of the teeth among a North Indian population. The data were collected from a genetically disparate population of the Punjab State of North India (150 males and 150 females). Dental casts of the subjects were made by the standard procedure. These casts were studied for non-metric and morphological characteristics of the teeth. The subjects with abnormalities of the palate and lips, such as a cleft palate and cleft lip, and the subjects who were wearing partial dentures and braces were excluded from sample selection. The morphological features consist of shovel-shaped tooth, Carabelli's cusp (single-cusp, bicuspids, and multi-cusp), occlusion (normal bite and open bite), anterior cross bite, posterior cross bite, crowding, abrasion, supernumerary teeth, erosion, diastemas, crowns, peg-shaped lateral incisors, grooves, twinned, hyperdontia, abnormal crowns, crown wear, hypocones, central ridges, protostylids, distal trigonid crests, and hypoconulids. The frequencies of occurrence of these characteristic features were noted.

The statistically significant sex differences were observed in the morphological features of teeth. The most common morphological features of teeth found in males and females are Carabelli's cusp (male 90% and females 98.7%), occlusion I (male 90.7% and female 86.7%), normal bite (male 75.3% and female 72%), grooves (male 96.7% and female 73.3%), hypocone (male 98% and female 96%), central ridge (male 96.7% and female 90%), and hypoconulid (male 90.7% and females 87.3%). The least occurring morphological features of teeth found in both the sexes are shovel shaped tooth (male 23% and female 29.3%), occlusion II (male 12.7% and female 11.3%), open bite (male 4% and female 3.3%), anterior cross bite (male 2% and females 2.7%), posterior cross bite (male 5.3% and females 1.3%), crowding (male 44.7% and females 40%), supernumerary teeth (male 0.7% and female 0%), diastema (male 8.7% and female 7.3%), crowning (male 1.3% and female 0.7%), caries (male 21.3% and female 18.7%), fracture (male 4% and female 3.3%), peg-shaped lateral incisor (male 6% and female 4%), and crown wear (male 0% and female 0.7%). The study may be of great help to forensic scientists and Disaster Victim Identification (DVI) team to identify the human remains on the basis of very rare and common morphological features of the teeth. The study further cites an example for linking up certain dental traits with a particular community, especially an endogamous group.

Forensic Odontology, Personal Identification, Non-Metric Traits

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