



Physical Anthropology Section – 2005

H34 Dental Enamel Thickness as a Method of Subadult Sex Determination

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After attending this presentation, attendees will learn about efforts to further explore dental enamel thickness as a possible subadult sex determination method from the dentition.

This presentation will impact the forensic community and/or humanity by providing awareness of a new potential subadult sex determination method for unknown human remains.

There is a paucity of sex determination methods for subadults. The methods that do exist can be highly subjective and/or variable in accuracy. The purpose of this study was to determine if dental enamel thickness could be used to determine sex in subadults. Past studies have shown that females with two X chromosomes generally have thicker enamel than males with one X chromosome and one Y chromosome. In order to test if females have thicker dental enamel than males, data were collected from bitewing radiographs from an ethnically diverse group of 89 children between the ages of two to 13 years. Dental enamel thickness measures were recorded from up to as many as eight separate teeth: right and left mandibular first and second molars, and right and left maxillary first and second molars (i.e., two teeth in each of the four quadrants). For each tooth, two measures were recorded: mesial enamel thickness and distal enamel thickness. Data for as many as 16 variables were recorded for each of the 89 children in the sample.

Results indicate statistically significant sex differences in the enamel thickness for the left maxillary first molar distal ($p < 0.027$) and the left mandibular second molar distal ($p < 0.050$). It is interesting to note that nearly significant sex differences were found for the enamel thickness measures of the right maxillary first molar ($p < 0.056$) and right mandibular first molar distal ($p < 0.068$). Further, the right maxillary second molar distal ($p < 0.053$) and the left mandibular first molar mesial ($p < 0.064$) were nearly significant. In all cases, the *distal measurements* showed greater sex differences than the mesial measurements of enamel thickness. Thus, of the teeth studied, the measures of distal dental enamel thickness for the left maxillary first molar and the left mandibular second molar appeared to be the best discriminators of sex in subadults.

The utility of these preliminary findings for assessing sex in forensic cases will be presented. The goal is to continue to research dental enamel thickness on additional known populations which could further substantiate this feature as a method of subadult sex determination.

Subadult Sex Determination, Dental Enamel Thickness, Forensic Anthropology, Human Identification