

G1 The Applicability of the “Dimodent” Sex Predictive Equation Assessed in a Senegalese Population

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Learning Overview: After attending this presentation, attendees will gain a method to achieve a sexual dimorphism using odontometric data specific to each population. The purpose of this study is establish the degree of this dental dimorphism within the population.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by demonstrating that the determination of gender is one of the most important and crucial steps in identification using the Dimodent method described by Fronty.¹

Materials and Methods: A total of 104 subjects (52 males and 52 females) aged 20 to 60 years were included in this study. Mesiodistal and vestibulo diameters, lingual of the mandibular lateral incisor and canine, were measured with a digital caliper on plaster models. The measurements obtained were integrated into the sexual prediction equation: $P=1/(1 e^y)+Y$. Y is evaluated based on measurements of mesiodistal and buccolingual diameters. The Mesiodistal Dimension (MD) was defined as the largest distance between the contact points on the proximal surfaces of the dental crown.

$P=1/(1 e^y)+Y$ is evaluated according to measurements of mesiodistal and vestibulo diameters. $Y=+24.2 (1.54*+I MD) (1.92*-I VL) (2.84* C-MD) (3.38*C VL)$ (I=Incisor, VL=Vestibulo-Lingual, C=Canine). The equations and P and Y were created on Excel[®] thanks to the inter- and intra-observer variabilities that were evaluated with the Kappa Cohen test.

After casting alginate (irreversible hydro-colloid) impressions with hard plaster, the measurements were taken along the long axis of each tooth, with a digital caliper with a digital display of precision of 0.01mm according to the method described by Dimodent.

This study included 104 Senegalese melanoderm subjects, including 52 women and 52 men randomly selected, with an average age of 41.22 years \pm 12.58. The study of inter- and intra-writing of the functions $P=1/(1 e^y)+$ where P expresses the probability of being in the presence of a feminine or masculine dentition. According to Dimodent: if P is between 50% and 100%, the teeth are probably female. If P is between 0% and 49%, the teeth are likely to be male. Depending on the value of P found, the samples were ranked according to the pattern.

The collected data were analyzed using Microsoft[®] Excel[®] (version 2013) software. The comparison of the data was made with the Chi-square Xtests² and Pearson and a significance level $p \leq 0.05$ was retained.

Results: The study of inter- and intra-examiner variability yielded a satisfactory kappa of 0.70. A statistically significant difference was found in the medial-distal ($p<0.0001$) and vestibul-lingual ($p<0.0001$) diameter of the canine. The measurements obtained on the lateral incisor, mesiodistal diameter, are not discriminate.

In this study, the overall positive prediction rate is 86.53%. The success rate was higher for men (90.38%) than for women (82.69%).

Conclusion: The method used in this study is simple and inexpensive to conduct and therefore can be applied in forensic odontology to establish an individual's sexual identity.

Reference(s):

¹. Fronty P., Coignet F., Ingrand P. Determination du sexe par l'analyse odontometrique des dents monoradiculees. *Biom Humet Anthropol*, 1998; 16:41-7.

Sex Assesment, Dimodent Equation, Mandibular Canine