

## ABSTRACT

### **Sex Determination using Dental Arch Width Study with Discriminant Analysis Function (3D Odontometric in Chinese Population)**

**Background:** Sex determination is the first parameter to be established in personal identification since it can cut down half of the population. Dental arch width had known to showed results in sex determination. However, every ethnicity has its characteristics. Problems with uncommon dental arch sizes can also be encountered (male with small values and female with high values)

**Purpose:** This study aim to define the differences of male and female's dental arch width as well as as categorization **Method:** A cross-sectional study was conducted in 40 dental casts of Chinese Population age 18-25 (20 male and 20 female). Dental casts were scanned with intraoral scanner and 3D measurement were done using Rapidform Explorer in ten parameters. Garn & Lewis method was used to identify variables with high sexual dimorphism then analyzed with independent t-test and discriminant function analysis **Results:** Ten parameters of maxillary ; coronal intercanine (IC), coronal interpremolar 1 (IP1), cervical interpremolar 2 (IP2), WALA interpremolar 2 (IP2), & cervical intermolar 2 (IM2) also mandibular ; coronal intercanine (IC), coronal interpremolar 1 (IP1), coronal interpremolar 2 (IP2), cervical interpremolar 2 (IP2), cervical intermolar 1 (IM1) between males and females were all statistically significant at  $P < 0,05$ . A discriminant function equation of maxillary [Sex=  $-31,772 + 0,291(\text{coronal IC}) + 0,172(\text{coronal IP1}) + 0,282(\text{cervical IP1})$ ] and mandibular [Sex=  $-12,576 + -0,11(\text{coronal IC}) + -0,447(\text{coronal IP1}) + 0,685(\text{coronal IP2})$ ] was derived for sex determination **Conclusion:** There were significant sex differences in the size of dental arch width based on discriminant function analysis

**Keyword :** Forensic odontology, sex determination, dental arch width, categorization, 3D imaging study, Chinese Population

## ABSTRAK

### **Penentuan Jenis Kelamin Menggunakan Lebar Lengkung Geligi dengan Analisis Fungsi Diskriminan (Odontometri 3D pada Populasi Tionghoa)**

**Latar belakang:** Determinasi jenis kelamin merupakan parameter pertama yang dapat ditentukan pada identifikasi seseorang karena mengeliminasi setengah jumlah populasi. Lebar lengkung geligi dapat dijadikan alat determinasi jenis kelamin. Setiap populasi akan tetapi memiliki ciri khas tersendiri. Permasalahan karena ukuran yang tidak umum juga dapat ditemukan (laki-laki berukuran kecil serta perempuan berukuran besar) **Tujuan:** Studi ini bertujuan untuk menjelaskan perbedaan lebar lengkung geligi laki-laki dan perempuan serta kategorisasi **Metode:** Studi potong lintang menggunakan 40 model studi Populasi Tionghoa berumur 18-25 tahun (20 laki-laki dan 20 perempuan). Model studi dipindai menggunakan pemindai intraoral dan pengukuran 3D dilakukan menggunakan *Rapidform Explorer* pada sepuluh variabel. Metode Garn & Lewis digunakan untuk mengidentifikasi variabel yang memiliki nilai seksual dimorfisme tinggi kemudian dianalisis dengan independen *t-test* dan analisis fungsi diskriminan **Hasil:** Sepuluh parameter dari maksila ; koronal interkaninus (IC), koronal interpremolar 1 (IP1), servikal interpremolar 1 (IP1), WALA interpremolar 2 (IP2), & servikal intermolar 2 (IM2) serta mandibula ; koronal interkaninus (IC), koronal interpremolar 1 (IP1), koronal interpremolar 2 (IP2), servikal interpremolar 2 (IP2), dan servikal intermolar 1 (IM1) antara laki-laki dan perempuan signifikan  $P < 0,05$ . Formula dari fungsi diskriminan pada maksila [Jenis Kelamin=  $-31,772 + 0,291$  (koronal IC) +  $0,172$  (koronal IP1) +  $0,282$  (servikal IP1)] dan mandibula [Jenis Kelamin=  $-12,576 + -0,11$  (koronal IC) +  $-0,447$  (koronal IP1) +  $0,685$  (koronal IP2)] didapatkan untuk determinasi jenis kelamin **Kesimpulan:** Terdapat perbedaan jenis kelamin signifikan dengan ukuran lebar lengkung rahang berdasarkan fungsi analisis diskriminan

**Kata kunci :** Odontologi Forensik, determinasi jenis kelamin, lebar lengkung geligi, kategorisasi, studi imaji 3D, Populasi Tionghoa