



Physical Anthropology Section – 2003

H10 The Hyoid Bone as a Sex Discriminator

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The purpose of this study was to assess whether the hyoid bone is a practical and reliable indicator of sex dimorphism.

With an ever-increasing number of archaeological and forensic cases involving fewer and fewer recovered remains, the suite of methods to ascertain the sex of the remains diminishes. In this eventuality, more and varied techniques are requisite for the accurate estimation of skeletal sex. Encouraged by positive results of recent radiographic analyses of sex dimorphism in the hyoid bone (Reesink et al. 1998), the author started collecting metric data on macerate specimens of the hyoid bone.

The hyoid bone is part of the cranium. It is positioned at the base of the tongue, suspended from the styloid processes of the temporal bones. It consists of a corpus, two greater cornua which articulate laterally, and two lesser cornua which articulate at the superior-lateral margins.

The choice of dimensional criteria was based on a review of the literature and on the measurements taken by Reesink et al. (1998) and Papadopoulos et al. (1989). Based on their earlier multivariate analysis of 13 traits, three traits appeared to be most useful in the radiographic analysis of sex dimorphism. The traits of choice are 1) the maximal height of the corpus (MMH); 2) the anterior posterior thickness of the corpus (ATP); and 3) the maximal transverse diameter of the corpus (MMH). The chosen traits are also those that are most easily taken.

Data were taken on 52 hyoid bones (38 male and 14 female) from past forensic cases, cadaver materials and archaeological remains where the sex was either known or was judged from a combination of pelvic morphology and discriminant functions. All measurements were taken to 0.1 mm. Hyoid bones with obvious pathology or trauma were excluded. Those hyoid bones that showed cornu-cornu fusion, to the extent of obliterating the measuring points, were omitted. Approximately 5% of the selected hyoid bones could not be measured, usually due to fusion of one or more greater cornua with the corpus. The classification formula is $0.56(\text{MMH}) + 1.92(\text{ATP}) + 2.46(\text{MTD}) - 73.2$, with male assigned to positive values and female assigned to negative values.

In males, 32 of 38, or 84.2%, were correctly classified. In females, 9 of 14, or 64.3%, were correctly classified. Overall 41 of 52 or 78.9% were correctly classified. Both combined and male classifications were a few percent better than Reesink et al. (1998) radiographic technique, while female classification was not as good. These results may be an artifact due to the rather larger male sample and to a lesser extent the racial mixture, which has not been considered in this sample. Determination of sex based on the individual hyoid measurements is not significant. However, the overall correct classification is significantly higher than apriori probability and thus may be a useful technique in sex determination. Further verification of this technique on larger, racially separate samples is suggested before these hyoid measurements are added to the stable of reliable sex discriminators.

Hyoid Bone, Sex Determination, Discriminant Function