## H71 Subadult Sexual Dimorphism in Long Bone Dimensions (The Luis Lopes Collection)

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After attending this presentation, attendees will learn how significant sexual dimorphism is present in subadult long bone dimensions. Attendees will also learn that the development of a new sex determination method for subadults, utilizing long bone dimensions, may be a possibility in the future.

This presentation will impact the forensic community by contributing to the available research on subadult sex estimation. This research is important because sex estimation is an important aspect of the biological profile. However, when dealing with subadult remains sex assessment is still very difficult. Development of a reliable sex determination method for subadults would aid in the identification of unidentified juvenile remains.

The purpose of this study is to evaluate sexual dimorphism of long bone dimensions in a sample of 72 individuals ranging in age from birth to 17 years. The sample was obtained from the Luís Lopes collection curated at the Bocage museum in Lisbon, Portugal. The subadult sample consisted of two groups, one group ranging in age from birth to 11 years and the second group ranging in age from 12 to 17 years. In order to test whether significant sexual dimorphism was present in the long bones, MANCOVA tests were performed on the following measurements: maximum clavicle length, maximum diameter of the clavicle, minimum diameter of the clavicle, circumference of the clavicle, maximum glenoid cavity breadth, maximum diameter of the humerus, minimum diameter of the humerus, circumference of the humerus, maximum breadth of the distal humerus, maximum diameter of the radius, minimum diameter of the radius, circumference of the radius, maximum diameter of the ulna, minimum diameter of the ulna, circumference of the ulna, maximum diameter of the femur, minimum diameter of the femur, circumference of the femur, maximum breadth of the distal femur, maximum diameter of tibia, minimum diameter of the tibia, circumference of the tibia, maximum breadth of the proximal tibia, maximum diameter of the fibula, minimum diameter of the fibula, and circumference of the fibula. Results of the analysis indicate that significant sexual dimorphism was detected in the clavicle, radius, and tibia of the young subadult group. In the older subadult group, significant sexual dimorphism was detected in the clavicle, humerus, ulna, femur, and tibia. Logistic regression tests were also performed on the data to determine the probability of classifying an individual into the correct sex group. Cross-validation was not available due to small sample sizes. Therefore, all probabilities are inflated and results should be considered preliminary. Although the probabilities are inflated, the results suggest that the sexual dimorphism in subadults may be significant enough to differentiate between the sexes. Clavicle measurements proved to be fairly accurate sex predictors for young and older subadults. Models constructed from clavicle measurements correctly sexed ~83% of the young subadult sample (≤11 years) and ~95% of the older subadult sample (≥12 years). Humerus, tibia, and ulna measurements were more accurate at predicting the sex of older subadults than younger subadults. Humerus measurements correctly classified ~77% of the younger subadult sample and ~94% the older subadult sample. Ulna measurements correctly classified 74% of the younger subadults and 86% of the older subadult sample. Although only ~72% of the young subadult sample was correctly sexed using tibia measurements, they appear to be very effective (~92% accurate) for predicting the sex of older subadults. Overall, the most accurate models for sexing subadults in this sample were constructed from the measurements of several long bones, but this greatly reduced the sample size. Approximately 91% of the young subadult sample was accurately classified using a combination of measurements from different long bones.

This research suggests that sexing subadults from long bone dimensions could be a possibility in the future. Further research should be conducted on sexual dimorphism in subadult long bone dimensions. Such research could lead to the development of a sex determination method for subadults.

**Subadult, Sexual Dimorphism, Long Bone Dimensions**