



Physical Anthropology Section – 2004

H95 Epiphyseal Closure Rates in the Srebrenica Youth

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This presentation will examine the rates of epiphyseal closures in Srebrenica sub-adults. By developing a population-specific standard for aging, anthropologists working in Bosnia can more accurately sort commingled remains, thus ensuring accurate identifications in situations where families lost multiple sons.

Gathering data on the rates of epiphyseal closures will assist in the identification process of those killed during the fall of Yugoslavia. This study will present histograms for each stage of epiphyseal closure. Using this data, the anthropologist can compare remains with these standards. These histograms will also be of aid when sorting commingled remains.

It is estimated that up to 40,000 people are unaccounted for from the armed conflicts in the former Yugoslavia from 1991 to 1999. The International Commission on Missing Persons (ICMP) has assumed the task of assisting in the identification of these individuals by performing large scale DNA analysis in conjunction with anthropological analysis. One important aspect this work is the accurate age estimation of skeletal remains. This is particularly true when identifying remains from the July 11-15, 1995, fall of Srebrenica in which an estimated 8000 Bosnians lost their lives. Srebrenica presents a particular problem for anthropologists because a majority of the male inhabitants of the town were killed. Not infrequently, a family will be missing two sons, whose age difference is minimal. If neither of these sons had any children, a DNA match is not sufficient to distinguish between them. As a result, the anthropologist must utilize all available skeletal data to correctly identify each son.

Anthropological standards that provide age range data based on various epiphyseal closures are widely available and easily attainable. However, none of these standards have been developed using skeletal samples from the Balkans. Balkan youth may age differently than data from non-Balkan standards, especially considering the effects of food deprivation and others stressors that were endured during an individual's critical physical growth periods. Because of the need for such accuracy, aging standards must be tested on the Bosnian youth and either noted as accurate, or a new standard based on this population must be devised.

This study considers only those youth who were killed in the Srebrenica massacre, thus mitigating variation in malnutrition and other stressors. Epiphyses in individuals between the ages of 14 to 30 were observed and assigned a score between zero and four. These scores denote open (0), beginning (1), active (2), recent (3), and complete union (4), following the method described by McKern and Stewart. Epiphyseal closures that were difficult to observe after eight years of taphonomic changes, such as the medial border and inferior angle of the scapula, and the transverse and spinous processes of the vertebrae, were not recorded. Age data were obtained once a DNA match was made and the identification completed.

Of 72 cases collected, results suggest that a majority of the epiphyses are completely fused two years earlier in the Bosnian population than those Americans killed in the Korean War as observed by McKern and Stewart. From these results, it would appear that the Srebrenica youth are maturing at an accelerated rate as compared to the American youth and that the age ranges offered by McKern and Stewart can be narrowed to address the growth rates of this population.

Epiphyseal Closures, Aging, Sub-Adults