F39 A Pilot Study to Investigate Sexual Dimorphism of the Teeth in a Guatemalan Forensic Population

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After attending this presentation, attendees will have gained an insight into a practicing forensic investigations and see how population- specific research can be immediately implemented into modern case reports that are presented to the judicial system in Guatemala.

This presentation will impact the forensic community and/or humanity by providing an additional tool in sexing the skeleton for the forensic community currently working in Guatemala in exhumations relating to the massacres that took place in the early 1980s. It is especially applicable to remains in a poor state of preservation and can be incorporated into forensic reports presented to the courts in Guatemala. It can also be used with caution for other populations within the Americas and for prehistoric Mayan populations. It can encourage other population- specific investigations relating to identification in forensic investigation in the human rights field.

The Guatemalan Forensic Anthropology Foundation (FAFG) currently works on the exhumation and analysis of victims of the Guatemalan Civil War mainly from the early eighties.

The majority of the remains are fully skeletonized with taphonomy such as climate (temperature and humidity), soil type, scavenging, insect activity, and human intervention influencing preservation of the remains. As a consequence, many skeletons recovered are incomplete and, in some cases, highly fragmentary making sex difficult to ascertain using traditional pelvis, skull and metric sexing techniques. Therefore, it is essential that methods be developed at the population-specific level to determine sex using the skeletal elements that are recovered, which is often the dentition. The purpose of this pilot study is to aid in the determination of sex based on the sexual dimorphism of teeth of the Guatemalan indigenous Mayan population.

The Guatemala massacres indiscriminately included men and women, young and old, which further complicates the process of identification. In poorly preserved cases, the clothes are used to determine sex. In court, this type of inference falls under a “presumptive identification,” and in Guatemala it is the ultimate decision of the judge to make a positive identification proving that scientific methods for sexing these skeletons is imperative. In addition, there are poorly preserved cases where the victims were buried without clothes, again suggesting the need for scientific methods. Therefore, the research from this pilot study is invaluable to the work of the FAFG.

Research on the determination of sex from teeth has been published with encouraging results and high confidence levels. There is general consensus that canines are the most sexually dimorphic teeth (Hillson 2005), while incisors, premolars, and the first molars are also useful for determining sex (Ditch and Rose 1972). In this pilot study, the first step is to determine if the teeth are sexually dimorphic within this population by testing the measurements set out by Ditch and Rose (1972). If this is validated, the next step is to incorporate the most sexually dimorphic teeth into a discriminate function analyses by following the statistical techniques of Ditch and Rose (1972). The advantage of this method is that it can be used to sex juveniles once the tooth crown has formed even if it has not erupted fully. The data set consists of 100 (fifty male, fifty female) adult Guatemalan Mayan skeletons of known sex.

The discriminate function analysis from this pilot study provides a scientific and population specific method that can be used alongside more traditional metric and non-metric sexing techniques in the FAFG. The results and implications of this research as related to population variation in morphology and the scientific analysis of cases will be discussed in this presentation.

Guatemalan, Sexual Dimorphism, Teeth

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