Medical Xpress

First study of sexual dimorphism in the deciduous canines of the Ratón Pérez collection

June 28 2023

Credit: Unsplash/CC0 Public Domain

The Dental Anthropology Group at the Centro Nacional de Investigación sobre la Evolución Humana (CENIEH) has published a paper on sexual

dimorphism in the journal *Anthropological Science*, examining the differences between the deciduous canines of the boys and girls who have donated their teeth to the Ratón Pérez Collection, held at the CENIEH.

The results obtained in this study, which employed techniques of virtual anthropology and 3D digital models, reveal that there is much less sexual dimorphism in the milk teeth than in the permanent dentition, and the reason may lie in the effect of hormones on the dimensions of the dentin.

"The dentin, as a living tissue that can respond to stimuli and biological signals, would be susceptible to changes in the concentrations of sex hormones, and could thus play a more decisive role than had been recognized in the appearance of sexual dimorphism in the permanent dentition," explains Elena Gil Donoso, lead author of this research.

Sex estimation

The study of sexual dimorphism, namely, the differences between men and women present within a population, can furnish valuable information about evolutionary processes and the selection pressures that have molded the physical and behavioral characteristics of the different species comprising our lineage. Likewise, studying these differences is a fundamental step for drawing up sex estimation methodologies in the forensic sciences.

The moderate sexual dimorphism found to be present in the deciduous canines analyzed contrasts with the results obtained in earlier studies conducted with the permanent dentition. In 2018, an analysis of these same variables in a forensic collection of permanent canines enabled the Dental Anthropology Group to devise a new technique of sex estimation. However, it is not possible to apply it to the milk teeth because the

sexual differences in the dentin component are smaller here, in comparison with the permanent dentition.

The other participants in this study carried out by the master's degree student Gil Donoso, under the supervision of the CENIEH researchers Cecilia García Campos and José María Bermúdez de Castro, were students taking the Master's in Physical Anthropology: Human Evolution and Biodiversity, given jointly by the Universidad de Alcalá, the Universidad Autónoma de Madrid and the Universidad Complutense de Madrid.

More than 4,500 teeth

This work has highlighted the crucial role wide-ranging reference dental collections such as the Ratón Pérez Collection play in investigating the variability present in our species.

The extensive Ratón Pérez Collection of milk teeth was created in 2014 with the objective that it would become a reference sample for use by scientists from a variety of disciplines. It has continued to expand since then with donations from all over Spain and abroad, and today it holds over 4,500 dental pieces.

"Thanks to the creation of this collection, it will be possible to carry out a lot of other dental anthropology studies, in which the participants could perhaps be students, as in this case, thus helping to train the upcoming generations of researchers," adds García Campos.

More information: Elena Gil-Donoso et al, Sexual dimorphism of deciduous canine dental tissues dimensions of modern human populations, *Anthropological Science* (2023). DOI: 10.1537/ase.230315