

JOURNAL of FORENSIC ODONTO-STOMATOLOGY

VOLUME 31 Supplement 1 October 2013

Abstract book IOFOS Conference 2013 Firenze

DENTAL MINERALIZATION AS AN INDICATOR OF SEXUAL MATURITY IN GIRLS

Alizé Lacoste Jeanson*, Vanessa Urzel, Jaroslav Bruzek, Frédéric Santos

* UMR 5199 PACEA « Anthropology of Past and Present Populations », CNRS, University of Bordeaux 1, France

The authors declare that they have no conflict of interest.

Background: Age at menarche and hand-wrist development are the most commonly used indicators to study growth and development in living subjects. Unfortunately, these parameters are unavailable in past populations. However, dental mineralization is a process frequently used for age estimation both in forensic contexts and in bioarchaeology.

The aims of this study are (1) to measure the correlation between dental mineralization and menarche, and (2) to assess the mean age of menarche by dental mineralization stages.

Materials and Methods: The sample comprised 147 girls aged between 7 and 17 years (mean age 12.06 ± 1.99 years). For each girl, one to four panoramic radiographs were collected representing a total of 161 radiographs. The girls were examined in private practice in the South West of France and at Department of Orthodontics (Bordeaux University Hospital) between 2005 and 2013. Dental mineralization stages were assessed by two different methods (1) Demirjian et al. 1973 and (2) Moorrees et al. 1963, based on the evaluation of crown and root mineralization using the seven left mandibular teeth (31 to 37). First, difference between age at examination and age at menarche was defined (subsequently referred as Menarche Examination Difference or MED). Then, the measurements of correlation between development stages of permanent teeth and MED were performed using four different statistical methods (correlation ratio; regression tree; classification tree; and Bayesian inference). Bayesian inference allows to determine the probability of attribution in ante, peri and post-menarche groups for each mineralization sequence.

Results: Using correlation ratio and Demirjian's stages definition, premolars (0.62 and 0.64) appear to be the most correlated teeth with MED, followed by second molar (0.54), and canine (0.51). For the Moorrees' stages, premolars (0.65 and 0.74) are the most correlated teeth with MED, followed by canine (0.52) and second molar (0.52). Regression trees based on Demirjian's stages suggest that (1) until stage F for premolars, and/or second molar, and until stage G for canine, girls belong to the ante-menarche group; (2) after stage G for premolars, and/or second molar, and after stage H for canine, girls belong to the post-menarche group. Regression trees based on Moorrees' stages suggest that (1) until stage R1/2 for second molar, stage R3/4 for premolars, and stage Rc for canine, girls belong to the ante-menarche group; (2) after stage R3/4 for second molar, stage Rc for premolars, and after stage A1/2 for canine, girls belong to the

post-menarche group. We also generate classification trees to identify the peri-menarche group. For this purpose, minimum and maximum MED, and specific mineralization sequences that are the most predictive were obtained. Bayesian inference strengthens the results previously obtained by giving probability of attribution for each mineralization sequence in ante, peri and post-menarche groups. This probability could be implemented in further samples tests to confirm the results.

Conclusion: *Despite the results found in previous studies, it appears that the process of dental mineralization is correlated to menarche in our sample. Correlation between these two indicators cannot provide the accuracy needed for clinical studies whereas it may be useful in bioarchaeological contexts.*

KEYWORDS: Forensic Odontology, Dental mineralization, Sexual maturity.

JFOS. October 2013, Vol. 31, Sup. No.1, Pag 57-58
ISSN :2219-6749