G10   Dental Age Estimation in Children With Juvenile Rheumatoid Arthritis (JRA)

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After attending this presentation, attendees will better understand the influence of JRA on dental age estimation.

This presentation will impact the forensic science community by providing results from dental age estimation with two different methods.

Introduction: Methods based on calcification of permanent teeth provide reliable and accurate tools for estimating the ages of children. Dental mineralization is considered to be relatively unaffected by important diseases, nutritional status, and environmental factors that can affect growth and maturation of other biological organs (e.g., the skeleton), which are routinely used for medicolegal and forensic age estimation; however, there are few published reports that specifically focus on age estimation for children affected by genetic, chromosomal, and autoimmune diseases. Therefore, the possible influence of disease on dental maturation in children has not been completely elucidated.

Goal: This study evaluates dental maturation in children with JRA and assesses whether this disease affects dental maturation.

Materials and Methods: This retrospective study analyzed a total of 120 orthopantomographs (OPGs) of 61 patients (44 females and 17 males) that were taken for clinical purposes. A total of 30 children underwent subsequent OPG examinations after a period of years. The sample age of the total study population ranged from 3.25 years to 16.18 years (average 9.24 years). A total of 19 patients had been treated with corticosteroid therapy. Digital photos of OPGs were prepared and submitted to two forensic odontologists acquainted with dental age estimation methods and procedures. Subject age and all clinical information were masked from the operators, except for the child's gender. Two different methods were utilized for age estimation: the original Demirijan method using seven teeth (D), and The London Atlas of Tooth Development and Eruption (LA). The statistician randomly selected 15 OPGs from the general population group; these were re-evaluated by the two operators to calculate intra-observer error. A control group (50 OPGs) of Unaffected Children (UAC) with similar age distribution and gender ratio was evaluated for age estimation using the D and LA methods. The age estimations for the population with JRA were compared to those for the UAC population to evaluate possible effects of JRA on dental maturation. A possible effect of corticosteroid therapy also was evaluated.

Results: Four different age estimates were obtained for each child (two operators and two methods). The inter- and intra-operator errors were considered. The availability of multiple OPGs for some individuals allowed evaluation of variable effects of JRA at different tooth developmental phases or physical age. Preliminary results indicate that there are no significant differences in age estimates for children affected by JRA and unaffected children. Statistical analyses of these results are ongoing.

Dental Age Estimation, Rheumatoid Arthritis, Forensic Odontology

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