Available online at www.sciencedirect.com

ScienceDirect

journal homepage: http://www.elsevier.com/locate/aob

Timing and sequence of emergence of deciduous teeth in Jordanian children

Ola B. Al-Batayneh [a,*], Ashraf I. Shaweesh [b], Earab S. Alsoreeky [c]

[a] Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan
[b] Department of Oral Medicine and Oral Surgery, Faculty of Dentistry, Jordan University of Science and Technology, Irbid, Jordan
[c] Paediatric Dentist, Madaba, Jordan

ARTICLE INFO

Article history:
Accepted 25 August 2014

Keywords:
Deciduous dentition
Timing
Tooth emergence
Tooth eruption
Sequence of tooth emergence
Jordanian children

ABSTRACT

Objective: The aim of this study was to provide the timing and sequence of deciduous tooth emergence in a sample of Jordanian children.
Design: A total of 1988 (885 female and 1103 male) children aged from 1 to 45 months recruited from nursery schools and child and maternity health centres in the northern, middle and southern regions of Jordan underwent a dental examination for the detection of deciduous tooth emergence. Children were categorized into 15 3-month-apart age groups. Using Probit regression (SPSS version 16), the median age of emergence per tooth was calculated for the total sample and for both genders.
Results: The period for acquiring deciduous dentition in the total sample ranged from 8.2 to 27.5 months. In either of the maxillary and mandibular arches, deciduous dentition emerged in the following order: central incisor, lateral incisor, first molar, canine and second molar. In addition, there were insignificant differences across side and there was a significant mandibular precedence of the central incisor although the maxillary precedence in the rest of the teeth was insignificant. Moreover, teeth emerged earlier in females although none of the inter-gender differences were significant.
Conclusions: The first standards of the timing and sequence of deciduous tooth emergence specific to the Jordanian population were provided. These standards will be used along with the previously published standards of permanent tooth emergence to aid managing patients in paediatric dentistry and orthodontics and will find applications in forensic and police sciences and in anthropological research.

1. Introduction

Eruption is defined as the movement of the tooth from the alveolar bone into the oral cavity; clinical eruption is considered a part of this process.[1] Emergence is more often defined as the first evidence of a tooth through the gingivae. For molars, some studies document emergence by evidence of one cusp and/or entire occlusal surface. A few reports scored the clinical stages of eruption of deciduous teeth.[2]

Deciduous tooth development starts before birth and is fully completed by about the fourth postnatal year.[3,4]

* *Corresponding author at*: Department of Preventive Dentistry, Faculty of Dentistry, Jordan University of Science and Technology, P.O. Box 3030, Irbid 22110, Jordan. Tel.: +96 27201000; fax: +96 227095115.
E-mail address: olabt@just.edu.jo (O.B. Al-Batayneh).
http://dx.doi.org/10.1016/j.archoralbio.2014.08.014
0003–9969/

Emergence of deciduous teeth begins around 4–8 months of age with the emergence of the lower incisors, and is completed at around 24–36 months of age upon the appearance of the second deciduous molars. The timing of tooth emergence varies by as much as 6 months.[5] The results of a review by Liversidge show that the sequence of deciduous eruption usually follows the sequence of formation with no clear pattern in the differences between jaws or between boys and girls.[6]

Generally speaking, differences in the average timing of eruption of teeth do not seem to follow a certain pattern among populations from different geographic areas and the outliers vary for different teeth. Although small population differences – of less than one standard deviation – have been reported in both eruption and tooth formation of human deciduous dentition,[6,7] factors related to deciduous and permanent tooth emergence vary from one population to another. Therefore, for more reliable application of tooth emergence standards, it was recommended that such standards should be derived from the population for which they are used.[5,8–10]

Population-specific standards of deciduous tooth emergence are valuable for the detection of temporal disturbances or anomalies affecting tooth development during early childhood.[11] In addition, the estimation of dental age by referral to available standards of deciduous tooth emergence is important if caries preventive programmes are to be introduced. Moreover, population-specific standards of deciduous tooth emergence should be available for reliable dental age estimation for forensic and police investigations and for anthropological applications.[5]

The literature available on deciduous tooth emergence has investigated various populations and ethnic groups. Although the standards of tooth emergence in Jordanians have been recently made available for permanent dentition,[10,12–14] there have not yet been any efforts towards providing standards on deciduous tooth emergence specific to Jordanian children. Currently, for the assessment of disorders of deciduous tooth emergence and dental age estimation, dentists and auxiliaries in Jordan have still been using the standards on timing and order of emergence available in the famous textbooks of oral anatomy (mostly derived from children of British or American backgrounds).[15,16]

As Jordanian children-specific standards of deciduous tooth emergence should be made available to be applied for managing Jordanian children, the objective of the current study was to provide such standards that will be integrated with the recently provided standards of permanent tooth emergence[10,12–14] and both will be used as reference databases in the field of paediatric dentistry, orthodontics, forensic investigations and anthropology.

2. Materials and methods

This cross-sectional study was conducted in Jordan on healthy children at different public and private nursery schools and on outpatients at maternity and child health centres. All participants were Jordanian citizens of Arab ancestry. Of the Jordanian participants, 95–97% are ethnically Caucasoid Arabs[17] who have been living in Jordan or the surroundings for several generations. Therefore, it is assumed that the participants of this study have minimal ethnical divergence.

The study received the ethical approval of the Institutional Review Board (IRB) at the Jordan University of Science and Technology (Approval Number 86/2011). In addition, the study was approved by the Ministry of Health and the Ministry of Development in Jordan as it required examining children at different public and private nursery schools and outpatients at maternity and child health centres.

A total of 1988 children (885 females and 1103 males) aged from 1 to 45 months underwent a simple dental examination for the detection of deciduous tooth emergence. The examinations of the participants, which took 6 months to be completed (from April to September 2011), were carried out by one investigator (EA) to avoid the effect of a potential inter-examiner error.

All efforts were made to obtain a sample representing Jordanian children. As the participants in this study were very young children not older than 4 years, it was challenging to recruit a sample perfectly representative of all Jordanian children due to the difficulty of accessing all children belonging to such an age group. In the previous study that provided the standards of permanent tooth emergence in Jordanians,[10] it was easier to access various categories of children in their kindergartens and primary schools. By contrast, very young children can be accessed only through a limited number of nursery schools and maternity and child health centres, which are normally available in urban and large rural agglomerations.

Before the assembly of the sample, the first step was to consider Jordan as an integration of three regions: North, Middle and South. The next step was to select one governorate per region. The Governorate of Irbid represented the North, Madaba the Middle and Karak the South. Then, a total of 18 nursery schools were randomly selected and incorporated into the sample. To limit the number of arranged visits and reducing travel expenses, it was decided that only nursery schools with >25 children be selected. As for maternity and child health centres, those with the largest flow of patients (>50 patients a day) were selected. Before the visits were arranged with the administration offices of the nursery schools and health centres, officials were addressed and approvals were provided.

With the help of the administration offices in nursery schools, consent forms and information statements about the projects were sent to the parents of potential participants. The information statement was a concise document in plain Arabic. It contains all the details that the parents needed to know about the participation of their children in our study. Only participants whose parents provided written consent participated in the study.

At health centres, parents were directly invited to allow their children to take part in our study. The details about our project were explained to them and they were given the opportunity to ask questions and get answers. Upon their consent, they were given consent forms to sign and their children were examined accordingly.

In addition to the section about providing consent, the consent form contained information about the needed