

What Has Changed in the Order and Chronology of Outbreak in Temporary Dentition?

Leslie Imara de Armas Gallegos*, Yaniris Figueroa Céspedes and Yaiset de la Torre Molina

Department of Orthodontics, Faculty of Stomatology Raúl González Sánchez, Cuba

*Corresponding author: Leslie Imara de Armas Gallegos, Second Degree Specialist in Orthodontics, Master in Stomatological Emergencies. Assistant Professor, Department of Orthodontics, Faculty of Stomatology Raúl González Sánchez, Cuba

Received:  January 19, 2021

Published:  February 03, 2021

Abstract

Introduction: In daily health care practice, it has been observed that there is a notable difference in the age at which the teeth erupt in patients, who do not comply with the established canons. This has sparked interest in the subject. Objective: to determine the changes in the order and chronology of the outbreak in the primary dentition at a national and international level.

Material and Methods: A search was carried out in 8 electronic databases of the systems (MEDLINE, PubMed, Hinari Cochrane, PubMed, SciELO, Scopus and Google Scholar). The articles reviewed were 59 articles of which 18 were selected for research.

Most relevant results: After the search, we found that the topic in general has been little addressed in primary dentition. Despite this, investigations were found in India, China, Indonesia, Saudi Arabia, and Turkey. In Latin America, research that makes it possible to demonstrate ethnic differences in the eruption process is even scarcer.

Conclusions: With the passage of time, the trend is towards an advancement in the chronology of dental outbreaks at the global and national level, so they do not conform to the established canons; In addition, there are greater modifications in the chronology than in the eruption sequence. There are ethnic differences in the eruption process, conditioned by the fact that each individual and each population have their own characteristics. This is the reason why some countries have established the chronology and sequence of the outbreak typical of their child population.

Keywords: Tooth outbreak; tooth eruption; outbreak order and chronology

Introduction

The concern to know the chronology of teeth sprouting is as old as stomatology itself [1]. The age of sprouting, as an indicator of maturation, was used by Saunder (1837), when considering the second permanent molar as an essential requirement to consider a child as fit to start working. Subsequently, Beick (1913) established the presence of the first permanent molar as a requirement to begin primary education [1,2]. The studies by Mayoral et al. [3] date from 1984 and were carried out in a foreign population, but it is not known with certainty how and where they obtained their results. In Cuba, the averages provided by Mayoral 3 have traditionally been used, but the first study of the chronology of the outbreak and dental eruption sequence was published for the first time in the central region of the country in 1987, where a study of 238 adolescents and young boys [4,5]. The normal pattern of tooth

eruption is variable. However, it is possible that this pattern, both in the primary and permanent dentition, is modified chronologically more frequently and sequentially by different associated genetic and environmental factors [3,5,6]. The usual sequence of outbreak of the primary dentition is as follows: first the central incisors (6 months) followed by the lower and 8 to 9 months, the upper, the first molars 12 to 14 months, the canines 16 to 18 months and the second molars at 24 months and 24 1/2, thus considering this first dentition finished [3,7]. Some factors involved in the timing of tooth eruption are age, sex, race, heredity, nutritional status, skeletal development, history of premature extractions of primary teeth, size of teeth with respect to of the jaws, genetic factors, some factors of intrauterine and postnatal development, as well as the elements of the environment and socioeconomic level.

All of the above conditions that each individual and each population have their own characteristics, for which it is stated that it is not possible to give precise dates for the dental emergency chronology as it is relatively variable. Despite what has been described, averages can be established for diagnostic purposes, to determine if there are noticeable advances or delays in dentition (tooth timing anomalies) and as a tool for the work of stomatologists who work with children [1,4,8]. Dental emergence has been a controversial issue in each region of the world, it has its characteristics depending on each place, so it is necessary to have outbreak chronology values typical of our context [2]. In daily care practice, it has been observed that there is a notable difference in the age at which the teeth erupt in patients, who do not conform to the established canons; although the normal eruption occurs in a certain time corresponding to a chronological age of the person [5,9]. These elements lead us to the scientific question of our research: What has changed in the order and chronology of the outbreak in the primary dentition? Therefore, our objective is to carry out a bibliographic review to determine the changes in the order and chronology of the outbreak in the primary dentition nationally and internationally.

Material and Method

A review of the scientific literature was carried out during the period from March to May 2020, focusing on the changes in the order and chronology of the outbreak in the primary dentition through a search in multiple manuals and 8 electronic databases of the systems. (MEDLINE, PubMed, Hinari Cochrane, PubMed, SciELO, Scopus and Google Scholar) The articles reviewed were 59 of which 18 were selected for the investigation. As a search strategy, keywords such as: eruption sequence, dental bud, dental eruption, order, and outbreak chronology were used. In addition to establishing a date limit (last 10 years), selecting only titles in Spanish, English and Portuguese. Full articles were obtained from abstracts / titles that met the initial selection criteria.

Development

With the passage of time, the chronology of tooth eruption has been advanced worldwide and nationally [2]. In the specialized literature, it is possible to show that the chronology of the eruption (much more than the sequence) can vary between different human population groups according to ethnic pattern, geographical distribution, and diet [6]. Worldwide, dental emergence occurs earlier in Africa, the Pacific, and indigenous Australians and Americans than in Europe and Asia [10,11]. In the Nigerian population the dental eruption is ahead of Arabia and America and delayed with respect to Ireland [11]. There are differences in the characteristics of tooth eruption in developed and underdeveloped countries. Diet, socioeconomic conditions, and climate are the main influencing social conditions. In underdeveloped countries the diet

is sometimes not adequate. Consuming hormone-rich GMO foods accelerates the rash, as does hot weather [2]. The state of body weight at birth may have an influence on alterations in the order and delay in the eruption chronology during the primary dentition stage, as well as an early mixed dentition with a high incidence of malocclusions [2]. This is evidenced in the following studies. In urban and rural areas of Beijing, 2230 children between the ages of 3 to 36 months were studied with the aim of evaluating tooth eruption in premature and low-birth-weight children. It concluded that prematurity and low birth weight can affect the outbreak of the primary dentition. Tooth eruption occurs late, while in high birth weight it occurs early compared to normal weight [11]. In Indonesia, Badruddin [12], analyzed the factors associated with the eruption pattern in the primary dentition. He concluded that there are significant differences in the age of onset and the duration of the eruption process according to the nutritional status of the mother and the child. The process is completed late in the females in correspondence with the males. He also showed that the rash pattern is influenced by the educational level and occupation of the mother and the nutritional status of the child.

Xiao Zhe Wang [11] within the framework of her publication stated that in a study in children from Saudi Arabia, she demonstrated a delay in the eruption of deciduous teeth compared to Caucasian children. For his part, Pratik Kariya [13] alludes in the study to the fact that children in Iceland have been shown to have an emergency age in primary dentition similar to Scandinavian children. Regarding the eruption sequence, there is variability in both jaws in both European and Latin American countries [2]. In 318 children under 36 months of age from southern Turkey, the first tooth erupted at around 208 days and the last tooth at 741 days. It was also evidenced that the order of emergence was the following lower central incisor, lateral incisor, first molar, canine and second molar [14]. In a study carried out in India by Indira Misore [15] with 1392 children aged 3-36 months in the period from December 2015 to June 2016, the results showed a variation in the outbreak sequence in the primary dentition, since the first molar did it before the lateral incisor; this altered sequence is more frequent in the mandible. The bibliography consulted insists that a certain order in the dental bud provides the optimal opportunity for the pieces to appear in the right place; but the way to measure the presence of alterations in that order varies according to the different studies. However, the study carried out by Pratik Kariya [13] in India, where patients between 5 to 36 months were evaluated in 4 geographical areas of the city, showed as a result that the first deciduous tooth to emerge in the oral cavity was the mandibular central incisor (8.15 ± 1.69 months). Girls were observed to experience a delay in outbreak compared to boys. There was also a lag when compared to the reference range of western populations. Morgado Seraffin [10] informs us about a study carried out in the Stormarn District in Germany, with a total of 1396 patients, 711 male and 685 female,

aged between 1.51 and 25.50 years of age, in a period of 20 years (1982-2002).

It was concluded that the dental eruption is advanced in the female sex. The dental eruption occurs symmetrically in both arches with an advance in the lower jaw in both sexes. In a study carried out in Brazil [16] with preterm infants, graduated from neonatal intensive care, with the aim of relating the eruption in deciduous teeth with natal and postnatal factors, it reflected that the age of emergence of the first deciduous tooth in preterm infants was delayed, when compared to chronological age, but there was no lag when compared to biological age. Currently it is proposed that an advance in the sprouting of the teeth could affect the occurrence of malocclusions. In 2017, Carreno [6] in his study carried out in Colombia showed - according to the three stages of eruption and dental replacement - that the teeth with the most variability were the upper and lower central incisors in the primary dentition due to advancement in their emergence. In a study carried out in Ciego de Ávila, Cuba [17], during the period September 2011 to September 2012, it was evidenced that with respect to the study carried out by Mayoral [3], in the 1980s the age of outbreak of the lower central incisor, upper and lower lateral incisors was maintained. However, the eruption of the upper central incisor was delayed until 8.4 months. The budding of the upper first molars was slightly advanced until 13.8 months and that of the upper canines until 16 months. The maxillary teeth erupted before the mandibular ones. The outbreak was symmetrical in both hemi arcades. In terms of chronology, there is an advance in most of the dental groups and there are no differences in the outbreak in relation to sex and ethnic group [18]. Morgado [2] suggests that the eruption sequence, fortunately corresponds to the most favorable sequence to maintain the arch length and gives the possibility that the teeth are properly located in their corresponding arch during the transition period between the primary and permanent dentition. During the bibliographic review, we faced some limitations, since not many publications were found on the order and chronology of outbreaks in primary dentition, the issue is mostly addressed in mixed and permanent dentition.

In Latin America, research that makes it possible to demonstrate ethnic differences in the eruption process is even scarcer. This highlights that what is urgent is not only to do science at a good level, but also to avoid the isolation of the scientific system and promote the strengthening of nuclei capable of translating the available knowledge, considering that the most up-to-date bibliography is in English. While most of the Third World countries have renounced their leadership in the scientific field, Cuba is committed to scientific and technological development as a vehicle for social development. Within this panorama, Cuba's position is very unique since children constitute a priority area and Orthodontics in our country has a purely social character. As part of this context, we

propose to continue carrying out this type of research, given that Cuban studies are scarce and restricted to very specific samples and locations. In fact, there are no national standards for the chronology of dental eruption obtained from studies, considerable due to their magnitude in the Cuban population.

Conclusions

With the passage of time, the trend is to advance the chronology of tooth eruption at the global and national level. There are greater modifications in the chronology than in the eruption sequence. The outbreak chronology is conditioned to the fact that each individual and each population have their own characteristics. Some countries have established the chronology and sequence of eruptions typical of their child population.

References

1. Chillón A de la T, Gómez IP, Barrera GB, Quinzán YS, Junco AR (2017) Chronology and sequence of eruption of the first permanent molars. *MEDISAN* 21(1).
2. Morgado Seraphim D (1984) The science-technology-society vision of the behavior of tooth eruption according to chronology and risk factors. *MEDICIEGO* 2013 19 (2). Mayoral J, Mayoral G, Mayoral P (Eds.), *Orthodontics: fundamental principles and practice*, Technical Scientific Editorial, Havana.
3. San Miguel Pentón A, Veliz Concepción OL, Escudero Alemán R Z (2011) Emergency chronology of permanent dentition in children from the municipality of Santa Clara: Part I *Rev Cubana Estomatol* 48(3).
4. Concepción Obregón T, Hernández S, Paula H, Matos Rodríguez A, Díaz Pacheco C (2013) Order and chronology of outbreak in permanent dentition. *Rev Cienc Méd Pinar Río* 17(3).
5. Carreño B, De La Cruz S, Gómez M (2017) Chronology of dental eruption in a group of Caucosoid mestizos from Cali (Colombia). *Rev Estomatol* 25(1).
6. War Labrada M, Murillo Castellanos A, Mibia Fong Borg A (2002) Tooth eruption. Myth or Reality. *Multimed* 6(1).
7. Vaillard Jiménez E, Castro Bernal C, Carrasco Gutiérrez R, Espinosa De Santillana I, Lezama Flores G, et al. (2008) Correlation of weight and height with dental eruption. *Rev Cuba Estomatol* 45(1).
8. B Holly Smith (2008) *Dental development (human)*. Wenda Trevatha, University of Michigan, USA.
9. Morgado Serafín D, García Herrera A (2012) Chronology and variability of dental eruption. *Mediciego* 17(Suppl. 2).
10. Xiao Zhe Wang, Xiangyu Sum, Jun Kang Quan (2019) Effects of Premature Delivery and Birth Weight on Eruption Pattern of Primary dentition among Beijing Children. *Chin J Dent Research* 22(2): 131-137.
11. Amalliah Badruddin I, R Putri M, Rahardjo A (2017) Factors Associated with Primary Teeth Eruption Pattern in Children Under Three Years Old in BejiDepok, West Java. *J IntDentMed Res*.
12. Pratik Kariya, Shobha Tandon, Sweta Singh (2017) Polymorphism in emergence of deciduous dentition: A cross-sectional study of Indian children. *J Invest Clin Dent* 9(1).
13. Bayram Coban, Leyla Kansu, Anil Dolgun (2018) Timing and sequence of eruption of primary teeth in southern Turkish children. *Acta Med. Alanya* 2(3).
14. Indira Mysore Devraj, Nandlal Bhojraj, D Narayanappa (2017) Polymorphism in the Eruption Sequence of Primary Dentition: A Cross-sectional Study. *Journal of Clinical and Diagnostic Research* 11(5): 72-74.

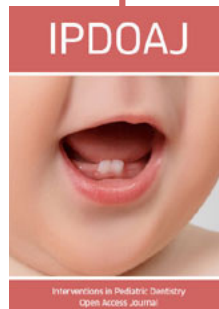
15. Vargas Dadalto EC, Wetler Marcona C, Martins Gómez AP (2018) Erupção do first dente decíduo in pre-thermo-born infants: accompanying 12 months. Rev Odontol UNESP 47(3).
16. Morgado Serafín D, García Herrera A (2013) Risk factors for chronological alterations of tooth eruption in the population of the Baraguá municipality. Mediciego 19(1).
17. García Cabrera M, San Miguel Pentón A, alvarez García I (2016) Chronology and order of outbreak of the permanent dentition. Acta Med Cent 10(2).



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here: [Submit Article](#)

DOI: [10.32474/IPDOAJ.2021.05.000218](https://doi.org/10.32474/IPDOAJ.2021.05.000218)



Interventions in Pediatric Dentistry : Open Access Journal

Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles