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Time and Eruption Sequence of Permanent Teeth among Sudanese Children in Khartoum State

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Abstract

The main purpose of this study is to determine the mean ages and standard deviation of eruption times for permanent dentition among Sudanese children and to compare it with other population groups.

Methodology : Descriptive cross sectional study school-based, basic schools in Khartoum state,study sample was 616 individuals.

Conclusion: from the result of the present study it could be concluded that parallel to earlier reports on different ethnic groups, the results of this study indicate that the permanent teeth of Sudanese children in Khartoum state erupt earlier in girls than in boys. The difference range from four months to one year.In this study the permanent teeth of Sudanese children in Khartoum state clearly emerge later than Africans by about 18 months. Caucasian precedes Sudanese in eruption time of anterior teeth only by 12 to 18 months with exception of these anterior teeth the time of eruption is almost same.

Keywords: Eruption time, permanent teeth, Sudanese

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Introduction

The ages at which the primary and permanent teeth erupt are of great significance in relation to growth and development of the child. Most parents consider tooth eruption an important event in the child development, hence are often anxious about timing and sequence of eruption. Several studies have shown variation in the ages at which teeth erupt as well as variation of eruption patterns between different ethnic and racial groups.The time and sequence of eruption of permanent teeth has been studied by several researchers in many parts of the world.

Objective

To determine eruption times among Sudanese children in Khartoum state, sequence and gender differences.

Methodology

Descriptive cross sectional study school-based, basic schools in Khartoum state,study sample was 616 individuals.For the purpose of this study eruption will be defined as "Any tooth or any part of its crown penetrating the gingiva and visible in the oral cavity".[1]

Statistical analysis used

Results were subjected to probit's regression analysis. The average age of eruption excluding third molars was given as the mean in months for each gender.

Results :

	Girls	Boys	
Upper Teeth	Mean±S.D	Mean±S.D	P_value
C.I	8.15±1.26	8.56±1.33	0.18
L.I	9.55±1.34	9.98±1.21	0.05 *
C	11.42±1.05	11.54±1.27	0.65
P.M1	10.93±1.19	10.75±1.32	0.60
P.M.2	10.70±0.70	11.70±1.03	0.01 *
M1	6.44±1.91	6.87±1.92	0.25
M2	11.90±1.17	11.90±0.81	1.00
Lower Teeth	Mean	Mean	P_value
C.I	7.94±1.19	8.49±1.41	0.06
L.I	9.53±1.25	9.85±1.23	0.13
C	11.39±1.15	11.51±1.24	0.67
P.M.1	10.89±1.22	11.43±1.23	0.13
P.M.2	11.18±1.14	11.56±1.03	0.39
M1	6.02±1.41	6.81±2.11	0.03 *
M2	11.86±0.88	12.31±0.85	0.32

Table 1: Comparison between the ages of eruption in boys and girls.

There was a trend for girls to erupt teeth earlier than boys. Statistically significant differences emerged in relation to maxillary lateral incisor and first pre-molar and mandibular first molar.

Author /year	Jaw	Girls	Boys
Hassan 2019. SUDAN	Upper	6-1-2-5-4-3-7	6-1-2-4-3-5-7
	Lower	6-1-2-4-5-3-7.	6-1-2-4-3-5-7.
Jaswal 1983. INDIA[2]	Upper	6-1-2-4-5-3-7.	6-1-2-4-3-5-7
	Lower	6-1-2-3-4-5-7.	6-1-2-3-4-5-7.
Kochkar[3] 1998	Upper	6-1-2-4-3-5-7.	
	Lower	1-6-2-3-4-5-7.	
Mayhall[4] 1978	Upper	6-1-2-4-5-3-7.	
	Lower	6-1-2-3-4-7-5.	

Table 2: 2-Sequence of eruption of Permanent Teeth in Sudanese boys and girls and its comparison with other studies showing almost identical sequence of eruption with some variation in pre-molar sequence

Tooth	Ghana	Australia	Iran	Sudan
M1	5	5.83	6.83	6.63
L.I	7.42	8.5	9.42	9.85*
C.I.	6.25	7.43	8.08	8.40*
M1	4.75	6.5	6.83	5.83
L.I	6.08	7.58	8.42	9.11*
C.I.	5.25	6.5	6.83	7.25*

Table 3 : 3-Comparison of eruption times (years) of Permanent incisors and first permanent molar with different ethnic groups showing same eruption times with Iranian but delayed when compared with other population

Discussion

For all permanent teeth, the mean age at eruption was lower for girls than for boys. This is similarly reported in a previous study on Japanese children.[5] and in a recent study on Danish children.[2]All mandibular teeth appeared to erupt earlier compared to their maxillary counterparts in both gender this finding is similar to other studies [6, 7]. Common sequence noted in boys in upper arch was first molar; central incisor; lateral incisor; first pre-molar; canine; second pre-molar and second molar (6-1-2-4-3-5-7). This sequence is in agreement with Kochhar who found this sequence in 16% of population he studied.[2] Sequence in lower arch was: first molar; central incisor; lateral incisor; first pre-molar; canine; second pre-molar; and second molar (6-1-2-4-3-5-7) it's in accordance with Kochhar who found this sequence in 6% of his study sample.

Girls sequence for upper arch was: first molar; central incisor; lateral incisor; second and first pre-molar; canine and second molar (6-1-2-5-4-3-7). This sequence is in agreement with Kochhar which found in 2% of population he studied.[2]

For lower arch it was: first molar; central incisor; lateral incisor; first and second pre-molar; canine and second molar (6-1-2-4-5-3-7). Children in the present sample had some maxillary and mandibular canines and premolars already fully erupted at the age of 6.5–8 years, suggesting emergence of permanent teeth into the oral cavity even at an earlier age. Possible causes of early emergence of the permanent teeth, such as early extraction of the primary teeth.[8] Some had permanent first molars fully erupted at age of 4 years, and permanent second molar fully erupted at 9 years in Fallata tribe suggesting role of ethnicity in the eruption of permanent teeth.

When this results compared with African studies it was evident that Sudanese children in Khartoum state erupt their permanent teeth later than Africans who showed eruption times earlier than Sudanese children by 18 months for first molar (as calculated from table 3). Australian and Western population showed earlier eruption time for central and lateral incisor only; the permanent central and lateral incisors erupted 1 to 1.5 years later in our study subjects compared to the Western population (as calculated from table 3). This exactly is in accordance withGupta et.al (2007),who studied Eruption age of permanent mandibular first molars and central incisors in the south Indian population.[9]Mayhall (1978) found that Inuit of both sexes showed statistically significant earlier emergence times than Montreal children, except for the incisors.[4]With no reference eruption age existing for Sudanese populations; this cannot be regarded as delayed eruption. Most probably this is because of very early premature extraction of primary teeth (11%) which delay the emergence time of permanent teeth in Sudanese population. The canine; premolars and molars erupt earlier than Australian the difference range from 2-6 months.The differences in timing of permanent tooth emergence among different ethnic groups have been attributed to genetic factors, environmental factors including socioeconomic status and nutritional factors and climate.

Conclusion

From the result of the present study it could be concluded that parallel to earlier reports on different ethnic groups, the results of this study indicate that the permanent teeth of Sudanese children in Khartoum state erupt earlier in girls than in boys. The difference range from four months to one year, and the mandibular teeth erupt earlier than the corresponding maxillary teeth. In this study the permanent teeth of Sudanese children in Khartoum state clearly emerge later than Africans by about 18 months. Caucasian precedes Sudanese in eruption time of anterior teeth only by 12 to 18 months with exception of these anterior teeth the time of eruption is almost same.

The result of the present study is almost identical with Iranian population for central, lateral incisor and first permanent molar teeth.

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