Vol 5 Issue 6 March 2016

ISSN No : 2249-894X

Monthly Multidisciplinary Research Journal

Review Of Research Journal

Welcome to Review Of Research

RNI MAHMUL/2011/38595 **ISSN No.2249-894X**

Review Of Research Journal is a multidisciplinary research journal, published monthly in English, Hindi & Marathi Language. All research papers submitted to the journal will be double - blind peer reviewed referred by members of the editorial Board readers will include investigator in universities, research institutes government and industry with research interest in the general subjects.

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Review of Research
International Online Multidisciplinary Journal

ISSN: 2249-894X Impact Factor : 3.1402(UIF) Volume - 5 | Issue - 6 | March - 2016

ERUPTION SEQUENCE OF PRIMARY AND PERMANENT TEETHIN A GROUP OF EGYPTIAN CHILDREN AT GIZA GOVERNORATE

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ABSTRACT:

Knowledge of dental eruption pattern must be taken into consideration during occlusal development, malocclusion diagnosis and efficient treatment planning.Aim of the study: Determine the eruption dates and sequence of primary and permanent teeth and Correlate between chronological and developmental age of eruption of primary and permanent teeth in a group of children in Giza Governorate, Egypt represented by percentage of deviation from the standard range. Study Design: Cross sectional observational study.Subjects and Methods:The study sample consisted of 1656 healthy Egyptian children of both sexes, 1120 children were randomly selected from Giza governmental schools.And 536 children were randomly selected from children attending Maternal andchild welfare centers and Giza public hospitals. Children were selected according to certain criteria then examined and the status of the eruption of each primary & permanent tooth was recorded on a

specially designed survey sheet.Statistical analysis: performed with IBM® SPSS® statistics version 20 for windows. Student's t-test was used for comparisons between mean ages of eruption in boys and girls. The significance level was set at P ≤0 . 05.One sample t-test was used to compare between mean ages of eruption of the study group and the standard values.Results:There was no statistically significant difference in mean ages of eruption of primary and permanent teeth between boys and girls and between right and left sides. Sequence of eruption of primary teeth among boys and girls was central incisors, lateral incisors, first primary molars, canines, second primary molars. Sequence of eruption of permanent teeth differed between boys and girls. For primary dentition there was statistically significant difference between mean ages of eruption and the standard range for some teeth whether in permanent dentition it was for most teeth. Conclusions: Ages and sequence of eruption of primary and permanent teeth differ among populations. The primary dentition exhibited less deviation from the standard range than the permanent dentition.

KEY WORDS: Primary and Permanent Teeth, Eruption sequence, Giza, Egypt.

INTRODUCTION:

The sequence of eruption of primary teeth and their shedding to be succeeded by permanent teeth considered as an ordered age specific event. Timing of eruption is a critical indicator during child development so most parents are watching their children for any variation (Peedikayil, 2011).Eruption of teeth is a natural physiological process by which a tooth moves from its site of development to its final functional position in the oral cavity. Emergence of teeth is the moment when the tooth pierce gingival tissue into the oral cavity. The process of eruption starts way before the emergence of the concerning tooth and continues throughout life(Yeung and Chu, 2014).

Up to date knowledge of dental eruption pattern must be taken into consideration during occlusal development, malocclusion diagnosis and efficient treatment planning of malocclusions in children and adolescents(Kauret al., 2010).Therefore, population specific standards for dental eruption dates are crucial resourcesfor general dental practitioners, orthodontists and pedodontists(Khan, 2011).The timing and sequence of eruption of primary teeth differed among populations and geographic areas and even within apparently homogenous groups which might be due to environmental factors (Solimanet al., 2011).Also eruption dates of permanent teeth varied among different races (Khan et al., 2008).

Different factors were detected to affect dental eruption as racial, ethnic, sexual and individual factors and they were always considered in determining the standards of normal eruption(Peedikayil, 2011).Aprevious study on Egyptian children concluded that eruption dates of primary teeth were near that of Saudi Arabians and Nigerians and earlier than in Iraqis and Nepalese (Solimanet al., 2011).A PhD Thesis was also conducted on orientation of permanent maxillary canines eruption among a group of 180 Egyptian children (90 males, 90 females), their ages ranged from 6 to 15 years and results showed that eruption of permanent canine among girls preceded boys and maxillary canine in boys erupted before mandibular ones (Abou El-Yazeed, 2005). Each individual had different eruption pattern depending on his ethnic or racial origin these variations need to be analyzed and should form the basis for developing a new standard table for tooth eruption customized to the population in which they are to be applied (Raoet al., 2014).

Due to unavailability of local data, the standards for eruption time being taught in Egyptian

dental colleges are based on non-Egyptian population, especially American and European standards, the present study aims to determine the eruption dates of primary and permanent teeth, correlate chronological and developmental age of eruption of primary and permanent teeth in a group of children in Giza Governorate, Egypt and determine sequence of eruption of primary and permanent teeth, in order to develop norms for Egyptian children.

SUBJECTS AND METHODS

The study sample consisted of 1656 healthy Egyptian children of both sexes, 1120 children were randomly selected from Giza governmental schools (El Mohamadya School, El Sedeek School, El Basha primary classes and El Magd school) and 536 children were randomly selected from children attending Maternal andchild welfare centers (KafrGabl health unit) and Giza public hospitals (Om El Masryeen Hospital). They were selected according to certain criteria:

1.For chronology of primary teeth Children aged 5 months to 3 years old, their ages were accurately determined according to their birth date. Their ages were confirmed from their parents and their birth certificate.
2.For chronology of permanent teeth children aged 5 to 12 years old, their ages were accurately determined according to their birth records present at the schools.
3.Children were apparently free from any systemic disease.
4.The dentition was free of any dental anomalies.

The protocol of this study was previously admitted to the Ethical Committee of the National Research Centre and approved with code no 13011. The purpose and the procedures were explained to the parents and written consent was taken from the parents before examination. Other information such as medical and dental history was also obtained.

Children were examined using disposable mouth mirrors to retract soft tissue and disposable dental probes. Both the upper and lower jaws were examined and the status of the eruption of each primary & permanent tooth was recorded. If any part of a tooth was visible, whatever small, the tooth was regarded as erupted and recorded on the survey sheet accordingly. If the tooth was not erupted the corresponding space on the survey sheet was left blank.Parents and children were questioned concerning their missing teeth, all teeth reported lost by accident or extractions were considered erupted. Birth dates were recorded from birth certificate or school birth date registers.

Probit regression analysis was used for estimation of tooth eruption. Age data were rounded to the nearest month. Each tooth was classified as (Present or absent). From these values the mean and standard deviation values of age of eruption were obtained. Paired t-test was used to compare between right and left sides and it yielded non-significant difference between the two sides, so the mean of the two sides was obtained. Student's t-test was used for comparisons between ages of eruption in boys and girls. The significance level was set at $P \leq 0.05$. One sample t-test used to compare between mean ages of eruption of the study group and the standard values relying on McDonaldet al., 2011. Correlation between chronological & developmental age of eruption of primary and permanent teeth in Egyptian children was represented in the form of percentage of deviation from the standard range. Percentage of deviation from the standard range calculated from subtracting the count of cases within standard from all the cases lying within the Minimum and maximum age of eruption.

RESULTS

Primary dentition

Comparison between boys and girls in mean ages of eruption forprimary teeth:

Table (1) and Fig. (1)show Mean, standard deviation (SD) values and results of Student's t-test for comparison between ages of eruption of permanent teeth in boys and girls in months. There was no statistically significant difference between mean ages of eruption of upper and lower primary teeth in boys and girls.

Table 1: Comparison between mean ages (by months) of eruption for primary teeth in boys and girls.

Gender	Boys		Girls		P-value
Tooth	Mean	±SD	Mean	±SD	
51, 61	9.8	±0.31	13.1	±0.61	0.618
52, 62	11	±0.40	16	±0.70	0.370
53, 63	19.7	±0.78	20.2	±0.78	0.952
54, 64	17.6	±0.76	17.3	±0.75	0.916
55, 65	23.8	±0.98	23.8	±0.98	1.000
71, 81	9	±0.20	10.8	±0.45	0.806
72, 82	9.6	±0.32	12.4	±0.35	0.557
73, 83	20.2	±0.79	20.5	±0.81	0.930
74, 84	15.7	±0.76	17.8	±0.50	0.897
75, 85	22.9	±0.92	23	±0.39	0.986

*: Significant at P ≤0 . 0 5

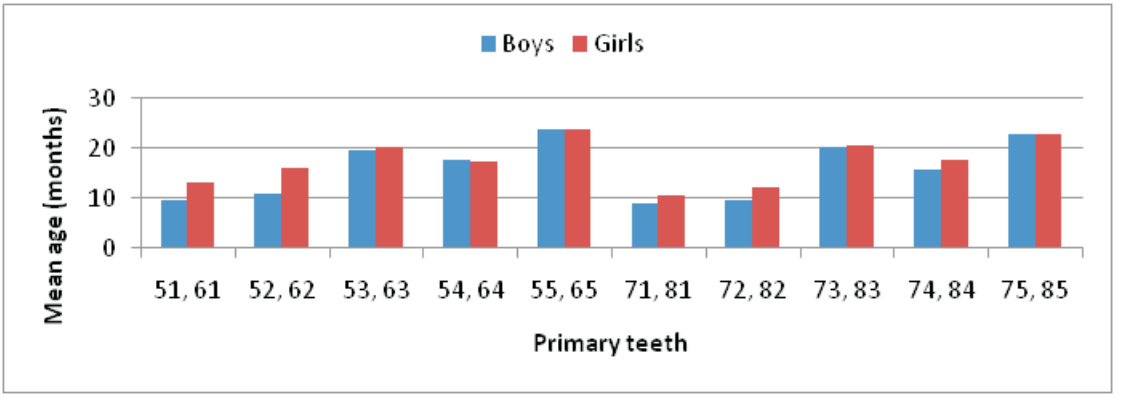

Fig. 1: Mean ages (by months) of eruption for primary teeth in boys and girls

Sequence of eruption of primary teeth in boys:

Fig. (2) shows sequence of eruption of primary teeth in boys as follow: lower central incisor, lower lateral incisor, upper central incisor, upper lateral incisor, lower first molar, upper first molar, upper canine, lower canine, lower second molar and upper second molar.

Sequence of eruption of primary teeth in girls:

Fig. (3) shows sequence of eruption of primary teeth in boys as follow: lower central incisor,

lower lateral incisor, upper central incisor, upper lateral incisor, upper first molar, lower first molar, upper canine lower canine, lower second molar and upper second molar.

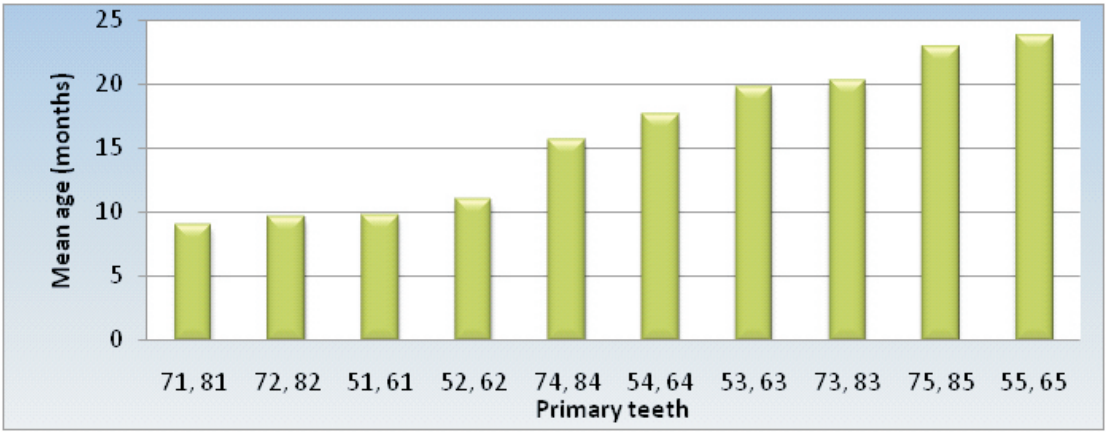

Fig. 2: Sequence of eruption of primary teeth in boys.

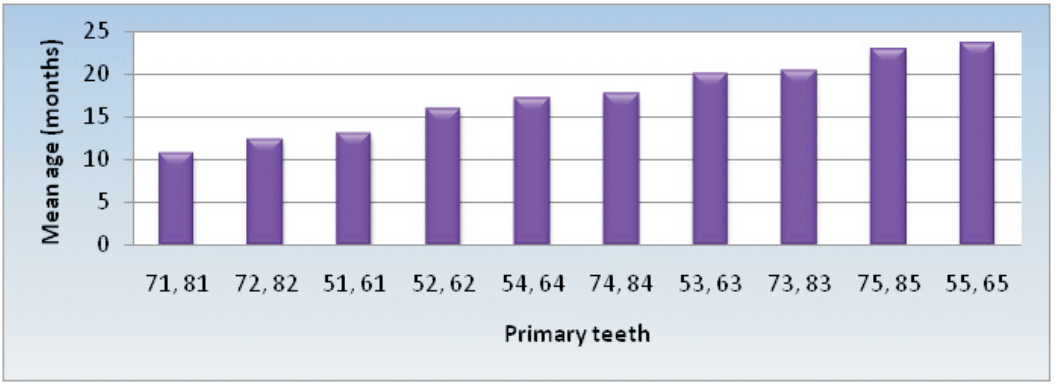

Fig. 3: Sequence of eruption of primary teeth in girls.

Correlation between chronological and developmental age of eruption of primary teeth in boys represented by percentage of deviation from the standard range relying on McDonaldet al.(2011):

Table (2)shows mean, standard deviation (SD), results of one sample t- test for comparison between mean ages of eruption and the standard range and percentage of deviation from standard range in boys. There was no statistically significant difference between mean age of eruption and the standard for all teeth except upper second primary molar, lower central and lateral incisors and lower second primary molar.

Table 2: Percentage of deviation for mean ages (by months) of eruption of primary teeth from standard range in boys.

Tooth	Mean	±SD	Standard Range ±1	P-value	Deviation from normal range (%)
51, 61	9.8	±0.31	10 (8-12)	0.815	25.2
52, 62	11	±0.4	11 (9-13)	1.00	63.3
53, 63	19.7	±0.78	19 (16-22)	0.384	51.9
54, 64	17.6	±0.76	16 (13-19)	0.076	1.9
55, 65	23.8	±0.98	29 (25-33)	0.001*	16.9
71, 81	9	±0.2	8 (6-10)	0.005*	54.3
72, 82	9.6	±0.32	13 (10-16)	=0.001*	78.2
73, 83	20.2	±0.79	20 (17-23)	0.892	53.7
74, 84	15.7	±0.76	16 (14-18)	0.835	22.1
75, 85	22.9	±0.92	27 (23-31)	0.003*	23.1

*: Significant at P ≤0 . 0 5

Fig. (4) shows percentage of deviation of upper and lower primary teeth from the standard range in boys. There was high percentage of deviation from the standard range exceeding 50% in upper lateral incisor, upper canine, lower central and lateral incisors and lower canine but other teeth showed low percentage of deviation.

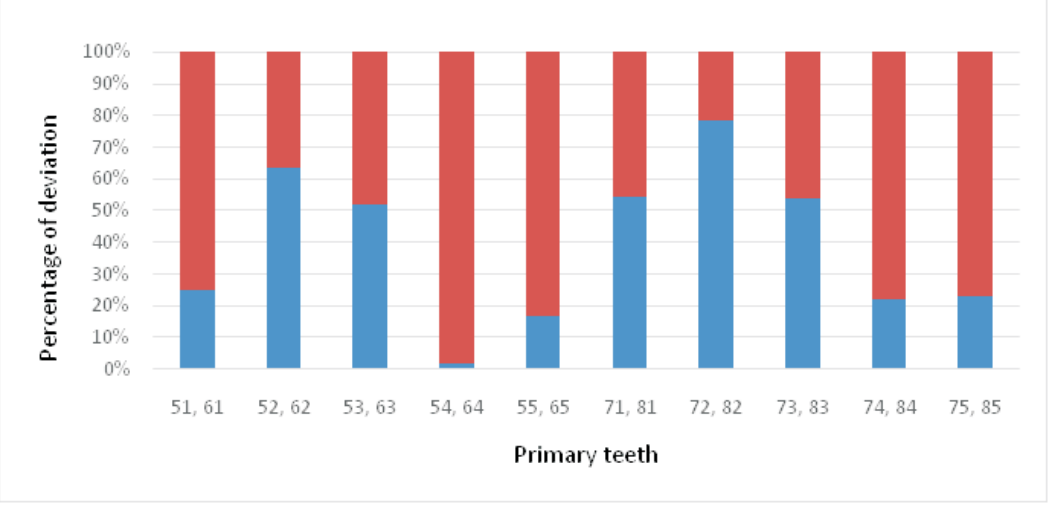

Fig. 4: Percentage of deviation for primary teeth from the standard range in boys.

Correlation between chronological and developmental age of eruption of primary teeth in girls represented by percentage of deviation from the standard range relying on McDonaldet al.(2011):

Table (3)shows mean, standard deviation (SD), results of one sample t- test for comparison between mean ages of eruption and the standard range and percentage of deviation from standard range in girls. There was statistically significant difference between mean age of eruption and the standard for all teeth except upper canine, upper first primary molar, lower central and lateral incisors and lower canine.

Table 3: Percentage of deviation for mean ages (by months) of eruption of primary teeth from standard range in girls.

Tooth	Mean	±SD	Normal Range	P-value	Deviation from normal range (%)
51, 61	13.1	±0.61	10 (8-12)	0.012*	2.6
52, 62	16	±0.7	11 (9-13)	=0.001*	82.0
53, 63	20.2	±0.78	19 (16-22)	0.284	11.5
54, 64	17.3	±0.75	16 (14-18)	0.098	11.4
55, 65	23.8	±0.98	29 (25-33)	=0.001*	22.4
71, 81	10.8	±0.45	8 (6-10)	0.078	0.0
72, 82	12.4	±0.35	13 (10-16)	0.088	87.5
73, 83	20.5	±0.81	20 (17-23)	0.711	12.8
74, 84	17.8	±0.5	16 (14-18)	0.002*	29.6
75, 85	23	±0.39	27 (24-30)	=0.001*	9.3

*: Significant at P ≤0 . 0 5

Fig. (5) shows percentage of deviation of upper and lower primary teeth from the standard range in girls.There was low percentage of deviation from the standard range for all teeth except in upper and lower lateral incisors.

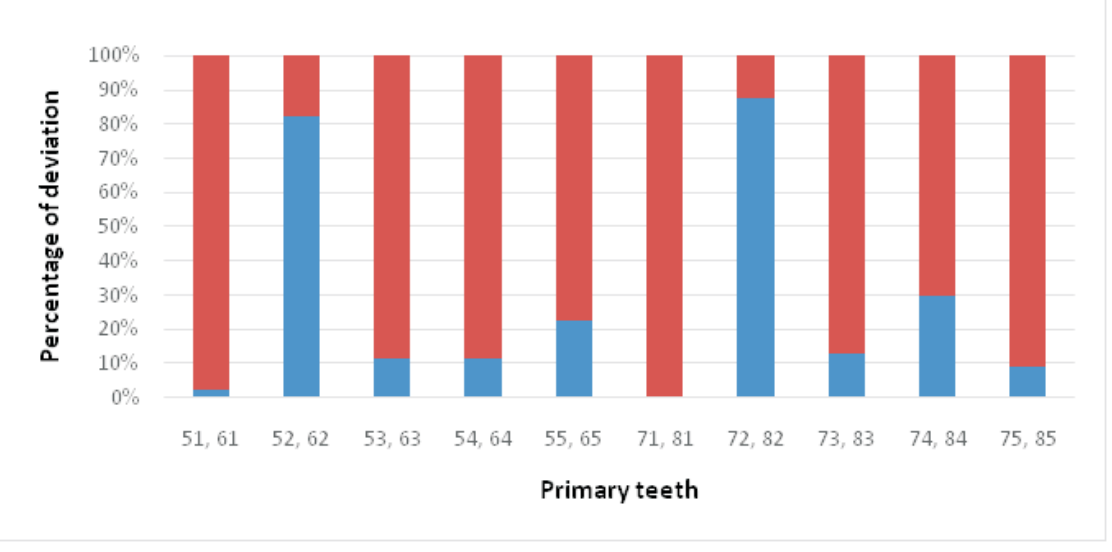

Fig. 5: Percentage of deviation for primary teeth from the standard range in girls.

Permanent dentition

Comparison between boys and girls in mean ages of eruption:

Table (4) and Fig. (6) show mean, standard deviation (SD) values and results of Student's t-test for comparison between ages of eruption of permanent teeth in boys and girls in years. There was no statistically significant difference between means age of eruption of upper and lower permanent teeth in boys and girls.

Table 4: Comparison between mean ages (by years) of eruption for permanent teeth in boys and girls.

Gender	Boys		Girls		P-value
Tooth	Mean	±SD	Mean	±SD	
11, 21	7.9	±1.97	7.9	±2.37	0.571
12, 22	8.5	±2.00	8.3	±2.41	0.498
13, 23	9.6	±2.39	10.2	±2.00	0.082
14, 24	9	±2.10	9.8	±2.16	0.712
15, 25	9.3	±2.18	10.1	±2.06	0.553
16, 26	6.9	±1.80	6.8	±1.38	0.813
17, 27	9.7	±2.45	10.5	±1.98	0.218
31, 41	6.8	±1.82	6.9	±2.26	0.893
32, 42	7	±1.95	7.1	±1.38	0.915
33, 43	9.2	±2.10	9.9	±2.15	0.927
34, 44	9.1	±1.98	9.8	±2.12	0.890
35, 45	9.2	±2.08	10.1	±2.04	0.618
36, 46	7	±1.70	6.5	±2.33	0.725
37, 47	9.4	±2.23	10.3	±2.08	0.834

*: Significant at P ≤0 . 0 5

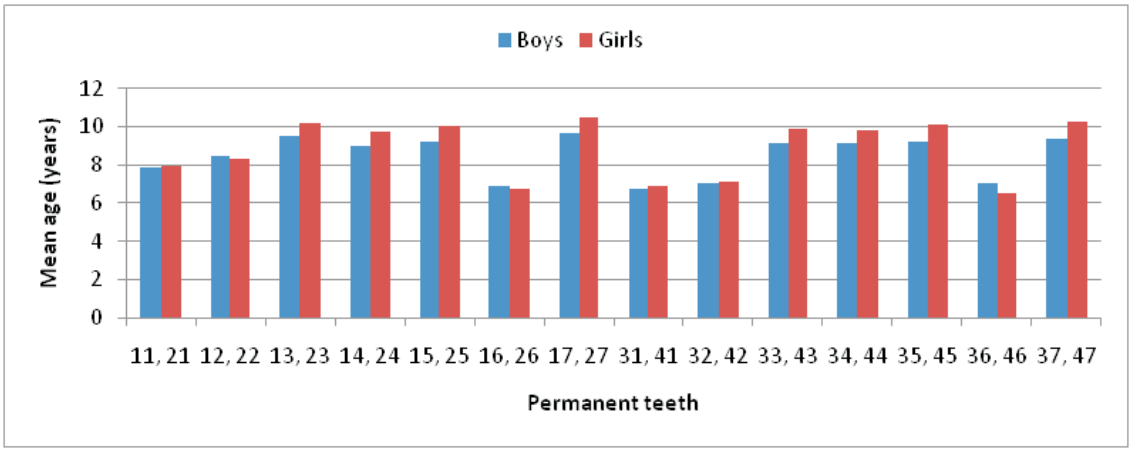

Fig. 6: Mean ages (by years) of eruption for permanent teeth in boys and girls.

Sequence of eruption of permanent teeth in boys:

Fig. (7) shows the sequence of eruption of permanent teeth in boysis lower central incisor, upper first molar, lower first molar, lower lateral incisor, upper central incisor, upper lateral incisor, upper first premolar, lower first premolar, lower canine, lower second premolar, upper second premolar, lower second molar, upper canine and upper second molar.

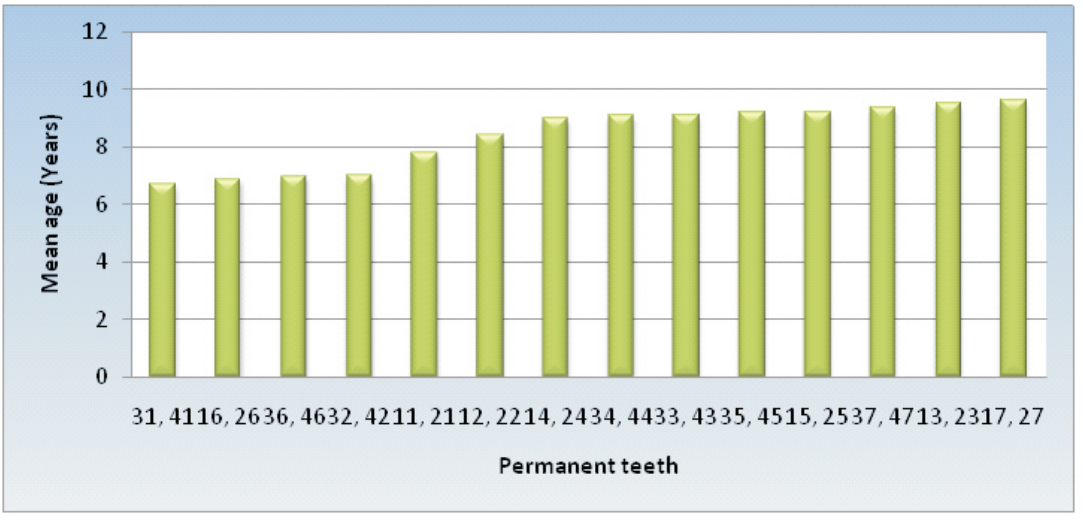

Fig. 7: Sequence of eruption of permanent teeth in boys.

Sequence of eruption of permanent teeth in girls:

Fig. (8) shows the sequence of eruption of permanent teeth in girlsis lower first molar, upper first molar, lower central incisor, lower lateral incisor, upper central incisor, upper lateral incisor, upper first premolar, lower first premolar, lower canine, upper second premolar, lower second premolar, upper canine, lower second molar, upper second molar.

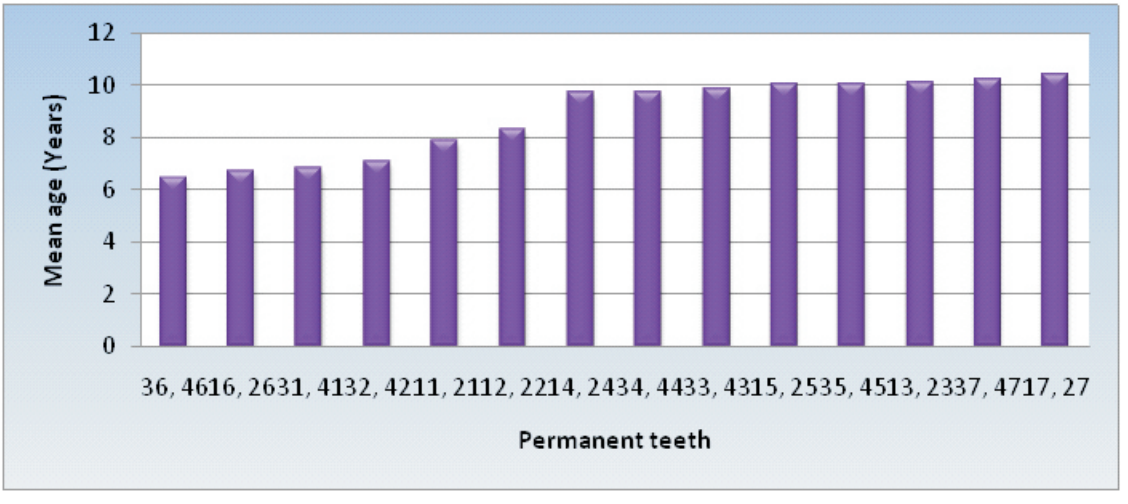

Fig. 8: Sequence of eruption of permanent teeth in girls.

Correlation between chronological and developmental age of eruption of permanent teeth in boys represented by percentage of deviation from the standard range relying on McDonaldet al., 2011:

Table (5)shows mean, standard deviation (SD), results of one sample t- test for comparison between mean ages of eruption and the standard range and percentage of deviation from the standard range in boys. There was statistically significant difference between mean ages of eruption and the standard for all teeth except upper lateral incisor, lower central incisor and lower canine.

Table 5: Percentage of deviation for mean ages (by years) of eruption of permanent teeth from standard range in boys.

Tooth	Mean	±SD	Standard range (years)	P-value	Deviation from standard range (%)
11, 21	7.9	±1.97	7.5(7-8)	0.026*	70.2
12, 22	8.5	±2.00	8.5(8-9)	0.767	72.1
13, 23	9.6	±2.39	11.5(11-12)	=0.001*	52.4
14, 24	9	±2.10	10.5(10-11)	=0.001*	52.0
15, 25	9.3	±2.18	11(10-12)	=0.001*	20.8
16, 26	6.9	±1.80	6.5(6-7)	=0.001*	84.0
17, 27	9.7	±2.45	12.5(12-13)	0.008*	88.9
31, 41	6.8	±1.82	6.5(6-7)	0.085	66.0
32, 42	7	±1.95	7.5(7-8)	0.003*	75.5
33, 43	9.2	±2.10	9.5(9-10)	0.223	86.2
34, 44	9.1	±1.98	11(10-12)	=0.001*	22.1
35, 45	9.2	±2.08	11.5(11-12)	=0.001*	67.4
36, 46	7	±1.70	6.5(6-7)	=0.001*	82.2
37, 47	9.4	±2.23	12(11-13)	=0.001*	50.0

*: Significant at P ≤0 . 0 5

Fig. (9) shows percentage of deviation of upper and lower permanent teeth in boys from the standard range. There was high percentage of deviation from the standard range exceeding 50% except upper second premolar and lower first premolar.

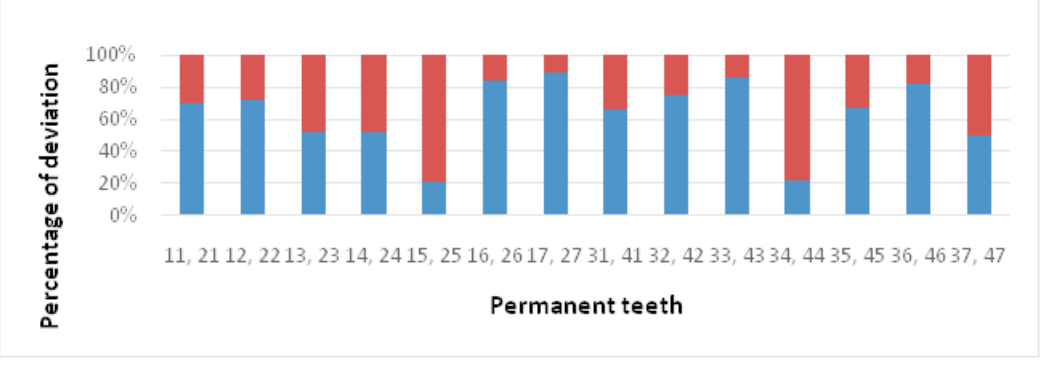

Fig. 9: Percentage of deviation of permanent teeth from the standard range in boys.

Correlation between chronological and developmental age of eruption of permanent teeth in girls represented by percentage of deviation from the standard range relying on McDonaldet al. (2011): Table (6) shows mean, standard deviation (SD), results of one sample t- test for comparison between mean ages of eruption and the standard range and percentage of deviation from standard range in girls. There was statistically significant difference between mean age of eruption and the standard for all teeth except upper lateral incisor and lower permanent molar.

Table 6: Percentage of deviation for mean ages (by years) of eruption of permanent teeth from standard range in girls.

Tooth	Mean	±SD	Standard range (years)	P-value	Deviation from standard range (%)
11, 21	7.9	±2.37	7.5(7-8)	0.013*	77.4
12, 22	8.3	±2.41	8.5(8-9)	0.283	84.0
13, 23	10.2	±2.00	11.5(11-12)	=0.001*	57.4
14, 24	9.8	±2.16	10.5(10-11)	=0.001*	74.7
15, 25	10.1	±2.06	11(10-12)	=0.001*	40.1
16, 26	6.8	±1.38	6.5(6-7)	=0.001*	86.5
17, 27	10.5	±1.98	12.5(12-13)	=0.001*	55.8
31, 41	6.9	±2.26	6.5(6-7)	0.006*	75.6
32, 42	7.1	±1.38	7.5(7-8)	=0.001*	89.1
33, 43	9.9	±2.15	9.5(9-10)	0.003*	86.3
34, 44	9.8	±2.12	11(10-12)	=0.001*	39.9
35, 45	10.1	±2.04	11.5(11-12)	=0.001*	58.0
36, 46	6.5	±2.33	6.5(6-7)	1.00	74.9
37, 47	10.3	±2.08	12(11-13)	=0.001*	20.5

*: Significant at P ≤0 . 0 5

Fig. (10) shows the percentage of deviation of upper and lower permanent teeth in girls from the standard range. There was high percentage of deviation from the standard range exceeding 50% except upper second premolar, lower first premolar and lower permanent second molar.

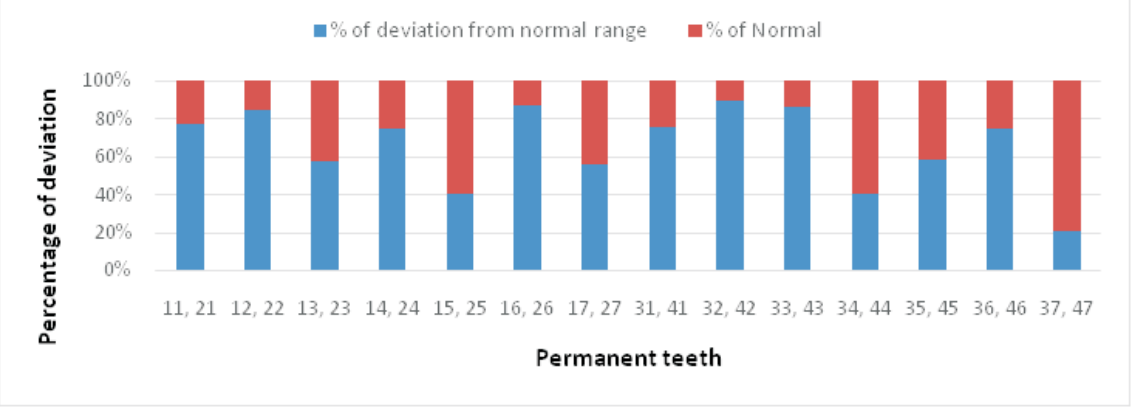

Fig. 10: Percentage of deviation of permanent teeth from the standard range in girls.

DISCUSSION

Eruption dates of primary and permanent teeth affected by ethnic origin more than any other factors such as the socioeconomic status or nutrition (Hussinet al., 2007).Population specific standards for tooth eruption dates and sequence were always very important for valid clinical assessment by dental practitioners(Shaweesh, 2012).

The study sample selected may be considered representative both quantitatively (large number of patients) and qualitatively for the population of Giza, because it was composed of patients with average living standards.Data were collected by one examiner, this reduced intra-examiner or inter-examiner errors and increased reliability and reproducibility of results like the study done in Jordan (Shaweesh, 2012).

Following a cross-sectional observational study design leaded to including large number of subjects with less expenses and efforts as the study conducted by Shaweesh (2012). A sample of 1656 children of both sexes were randomly selected, 536 children age ranged from 5 to 36 months to include eruption of all primary dentition similar to studies conducted in Egypt bySolimanet al.(2011) and in Nigeria by Owotadeet al.(2008).While the 1120 children age ranged from 5 to 13 years to include eruption of all permanent dentition excluding the third molars due to its large variability of eruption time, frequent missing germ and impaction, this came in agreement with Sharafet al.(2012)from Egypt,Friedrichet al.(2009) from Syria and (Nichiforet al., 2011) from Romania.

The first primary tooth erupted was lower central incisor at a mean age 9 months for boys which was earlier than previous studies in Egypt by El-Beheri and Hussein(1987) and Abd El Hakamet al.(2015) who reported a mean age 10.39 and 18.8 months respectively and slightly delayed from Solimanet al.(2011)who reported a mean age 8 months and in relation to other populations it was far early than Indian children Raoet al.(2014) who concluded a mean age 13.5 months and close to Jordanian children [Al-Batayneh et al, 2015] who was at a mean age 8.3 months. In girls the first primary tooth erupted was also the lower central incisor but at a mean age of 10.8 months which was near to El-Beheri and Hussein(1987) who reported a mean age 11.11 months, delayed than Solimanet al.(2011)and Al-Bataynehet al.(2015) who reported a mean age 7.9 and 8.1 months respectively and far earlier than Abd El Hakamet al.(2015 who reported a mean age 18.96 months.

While in permanent dentition the first toothin boys was the lower central incisor at a mean age of 6.8 years which was consistent with the previous study by Sharafet al.(2012) and with Lithuanians (Almonaitieneet al., 2012). Butother studies in Kafr El Sheikh Governorate(Abd El Hakamet al., 2015) and others like India(Kauret al., 2010) and Jordan(Shaweesh, 2012) reported that lower first molar was the first tooth erupted in boys. In girls the first permanent tooth erupted was the lower first molar at a mean age of 6.5 years which was not consistent with the previous study by Sharafet al.(2012)and with Lithuanians (Almonaitieneet al., 2012) who found that the first tooth in girls was the lower central incisor. Also was not consistent with Abd El Hakamet al.(2015) who reported the upper first molar the first tooth. But Malaysians (Hussinet al., 2007) and Jordanians (Shaweesh, 2012) reported the same at a mean age 6.4 and 6.08 years respectively.

Consistent with the findings reported from different populations like Nepal (Gupta et al., 2007), Australia (Woodroffeet al., 2010) and Jordan (Al-Bataynehet al., 2015) and the findings reported from Egypt by El-Beheri and Hussein(1987), Solimanet al.(2011) and Abd El Hakamet al.(2015) findings of the present study indicated that sequence of primary teeth eruption within the arch followed the standard pattern relying on McDonaldet al.(2011).When both arches were combined sequence of eruption differed a little from that reported by El-Beheri and Hussein(1987) and Abd El Hakamet al.(2015)as the lower primary lateral incisor erupted earlier than upper primary central and lateral incisors for both genders contradicting the general agreement that lateral incisors erupt first in the maxilla but this agreed with GunaShekhar and Tenny(2010) for Indian children. Also in boys, the lower primary first molar erupted before the upper one as that reported by Solimanet al.(2011).

For permanent dentition the most common sequence of eruption of canines and premolars in maxilla were first premolar, second premolar then canine for both sexes which is similar to that reported by Sharafet al.(2012)for both sexes and Abd El Hakamet al.(2015) for boys. While in mandible the sequence was first premolar, canine then second premolar for both sexes which was also similar to Sharafet al.(2012)but differed from Abd El Hakamet al.(2015) and other population like Romanians (Feraruet al., 2011) and Malaysians (Hussinet al., 2007). This difference may be due to different environmental factors or genetic variations. Second molars and canines tended to erupt at a younger

age in the last decades which could be explained by accelerated process of general development and the beginning of puberty at a younger age this came in agreement with Nichiforet al.(2011).

Thenon significant difference between boys and girls went in accordance with Indians (Raoet al., 2014)and Pakistanis (Khan, 2011), but it was noticed that in general boys preceded girls which agreed with previous studies on Egyptian children reported by El-Beheri and Hussein (1987), Solimanet al.(2011) and with studies on other populations as Nigeria (Owotadeet al., 2008) and Saudi Arabia(Al-Jasser and Bello, 2003) and was in disagreement with the previous Egyptian studies by Sharafet al.(2012)and Abd El Hakamet al.(2015)and with many other studies on different populations like Australians [Diamantiand Townsend, 2003], Turkish [Wedl et al, 2004], Lithuanians (Almonaitieneet al., 2012), Jordanians (Shaweesh, 2012), Nepalese (Gupta et al., 2007) and Jordanians (Al-Bataynehet al., 2015). The earlier eruption among boys was explained by [Infante, 1974] to be due to male advancement in first trimester human embryos.

In general mandibular permanent teeth in both genders erupted before their maxillary opponents which is in agreement with what was reported by other populations like Turkish (Wedl, 2004), Romanians (Nichiforet al., 2011) and Lithuanians (Almonaitieneet al., 2012) and by Abou El-Yazeed et al., (2008) for Egyptian children. This can be explained by earlier development and mineralization of the tooth buds of the mandibular teeth that precede the tooth buds of the maxillary teeth.

A standard range was taken from McDonaldet al.,(2011) to rely on as a chronological age of teeth, based on that it's the most recent worldwide standards on which most nations all over the world rely on.There was statistically significant difference between mean age of eruption of primary teeth and the standard range relying on McDonaldet al.(2011) for some teeth in both boys and girls less than that found in permanent dentition which indicates that ethnic variations played a major role in eruption of permanent teeth. There was high percentage of deviation from the standard range exceeding 50% for most permanent teeth in both boys and girls; this can be explained by high caries prevalence of primary teeth in most developing low-income countries in Asia and Africa as reported by WHO (2012). In comparing levels of asymmetry between the primary and permanent dentition according to Guatelli-Steinberg et al.(2006), it was suggested that symmetry in tooth eruption directly associated with the developmental time span for each specific class of teeth. This would suggest that the primary dentition may exhibit less asymmetry than the permanent dentition due to the controlled intrauterine environment and shorter period of calcification and development.

From the results of the present study it was obvious that mean ages and sequence of eruption of primary and permanent teeth in Egyptian population was different from that of other populations due to several racial, socioeconomic, environmental or genetic factors which indicate that considering Egyptian standards in preventive, orthodontic, pediatric and educational fields would be more reliable.

CONCLUSIONS

From the results of the study it was concluded that:

- Ages and sequence of eruption of primary and permanent teeth differ among populations.
- Mandibular primary teeth showed earlier eruption dates in relation to their maxillary counterparts for both sexes, except for maxillary canine for boys and girls and maxillary first molar for girls.
- Mandibular permanent teeth in both genders erupted before their maxillary opponents except for upper first premolar and upper first molar in boys and upper first and second premolars in girls.
- Boys preceded girls in primary teeth eruption except the upper first molar.
- All permanent teeth erupted sooner in boys than in girls except for upper lateral incisor, upper and

lower first molars.

• The primary dentition exhibited less deviation from the standard range (McDonaldet al., 2011) than the permanent dentition.

• Updated population specific standards for Egyptians should be the basis for diagnosis, treatment planning and preventive programs upon which orthodontists and pediatric dentists can rely on.

REFERENCES

1.Abd El Hakam R., Taha S., Abou El Yazeed M. and Nasr R. 2015. The Eruption Sequence of Primary and Permanent Teeth in a Group of Children in Kafr El-Sheikh Governorate, Egypt. Rev. Res. J., 4: 1-11.

2.Abou El-Yazeed M. 2005. Relative Position and Orientation of Developing Permanent Maxillary Canines in Relation to Maxillary Lateral Incisors and First Premolars in a Group of Egyptian Children. PhD Thesis, Faculty of Oral and Dental Medicine, Cairo University, Egypt.

3.Abou El-Yazeed M., AbouZeid W. and Tawfik W. 2008. Dental Maturation Assessment by Nolla's Technique on a Group of Egyptian Children.Aust. J. Basic Appl. Sci.,2: 1418-24.

4.Al-Batayneh O., Shaweesh A. and Alsoreeky E. 2015. Timing and Sequence of Emergence of Deciduous Teeth in Jordanian Children. Arch Oral Biol., 60: 126 -33.

5.Al-Jasser N. and Bello L. 2003. Time of Eruption of Primary Dentition in Saudi Children. J Contemp Dent Pract.,4: 65–75.

6.Almonaitiene R., Balciuniene I. and Tutkuviene J. 2012. Standards for Permanent Teeth Emergence Time and Sequence in Lithuanian Children, Residents of Vilnius city. Stomatologija, Baltic Dent Maxillofac J., 3: 93-100.

7.Diamanti J. and Townsend G. 2003. New Standards for Permanent Tooth Emergence in Australian Children. Aust. Dent. J., 48: 39–42.

8.El-Beheri S. and Hussein M. 1987. Sequence and Age of Emergence for Deciduous Teeth among A Group of Children in Urban and Rural Areas of Egypt.Egypt Dent. J., 33: 13-30.

9.Feraru I., Rãducanu A., Feraru S. and Herþeliu C. 2011. The Sequence and Chronology of the Eruption of Permanent Canines and Premolars in a Group of Romanian Children in Bucharest. Oral Health Dent Manag.,10: 193-8.

10.Friedrich R., Habib S. and Scheuer H. 2009. Eruption Times of Permanent Teeth in Children and Adolescents in Latakia (Syria). Arch.Kriminol., 223: 84-97.

11.Guatelli-Steinberg D., Sciulli P. and Edgar H. 2006. Dental Fluctuating Asymmetry in the Gullah: Tests of Hypotheses Regarding Developmental Stability in Deciduous Vs. Permanent and Male vs. Female Teeth. Am J. Phys.Anthropol., 129: 427–34.

12.GunaShekhar M. and Tenny J. 2010. Longitudinal Study of Age and Order of Eruption of Primary Teeth in Indian Children. J.Clin. Exp. Dent., 3: 113-6.

13.Gupta A., Hiremath S., Singh S., Poudyal S., Niraula S. et al.2007. Emergence of Primary Teeth in Children of Sunsari District of Eastern Nepal. McGill J. Med., 10: 11–15.

14.Hussin A., Mokhtar N., Naing L., Taylor J. and Mahmood Z. 2007. The Timing and Sequence of Emergence of Permanent Teeth in Malay School Children in Kota Bharu, Malaysia. Arch.Orofac. Sci., 2: 36-40.

15.Infante P. 1974. Sex Differences in the Chronology of Deciduous Tooth Emergence in White and Black Children. J. Dent. Res., 53: 418-21.

16.Kaur I., Singal P. and Bhatnagar D. 2010. Timing of Permanent Teeth Emergence and Dental Caries among Jatsikh Children of Public and Government Schools of Patiala District. Anthropologist, 12: 141-8.

17.Khan N. 2011. Eruption Time of Permanent Teeth in Pakistani Children. Iranian J Publ Health, 40: 63-73.
18.Khan N., Chohan A., Al Nasser F. et al.2008. Statistical Presentation of Eruption Age of Permanent Second Molars, Premolars and Canines in Female School Children living in Riyadh, Saudi Arabia.Saudi Dent J., 20: 140-9.
19.McDonald R., Avery D. and Dean J. 2011. Eruption of the Teeth: Local, Systematic and Congenital Factors that influence the Process. Dentistry for the Child and Adolescent; Mosby's 9th Ed., 151-2.
20.Nichifor M., Scutariu M., Mocanu C., Crauciuc E., Ungureanu E., Toma O. and Scutariu M. 2011. Study Regarding the Sequence of Eruption of Permanent Teeth at A Group of Children from Buzau. Sci Ann "AL. I. Cuza" Univ IASI, Series Mol Genet Biol., 12: 85-94.
21.Owotade F., Oziegbe E., Sofowora C. and Esan T. 2008. Eruption Chronology of Primary Teeth in Nigerian Children. J ClinPediatr Dent., 32: 341-5.
22.Peedikayil F. 2011. Delayed Tooth Eruption. E-Journal of Dentistry. 1: 81-86. Available from www.ejournalofdentistry.com [accessed 22 January 2015].
23.Rao A., Rao S., Shenoy R. and Ghimire N. 2014. Changing Trends in Tooth Eruption-Survey among Children of Mangalore, India. Int. J. Adv. Res., 2: 449-54.
24.Sharaf R., Taha S. and El-Dokky N.2012. A Study on the Sequence of Eruption of Permanent Teeth in a Group of Egyptian Children. Cairo Dent J., 28: 235-9.
25.Shaweesh A. 2012. Clinical duration of permanent tooth eruption in Jordanians: from emergence to functional eruption. Intl. J.Stomatol.Occl. Med., 5: 70–6.
26.Soliman N., El-Zainy M., Hassan R. and Aly R. 2011. Timing of Deciduous Teeth Emergence in Egyptian Children. East Mediterr Health J., 17: 875–81.
27.Wedl J., Schoder V., Blake F., Schmelzle R. and Friedrich R. 2004. Eruption Times of Permanent Teeth in Teenage Boys and Girls in Izmir (Turkey). J.Clin. Forensic Med., 11: 299–302.
28.WHO, 2012. Oral Health Fact Sheet N. 318. www.who.int/mediacentre/factsheets/fs318/en/. Last accessed June, 2015.
29.Woodroffe S., Mihailidis S., Hughes T., Bockmann M., Seow W., Gotjamanos T. et al.2010. Primary Tooth Emergence in Australian Children: Timing, Sequence and Patterns of Asymmetry. Aust. Dent. J.,55: 245–51.
30.Yeung C. and Chu C. 2014. A Review of the Eruption of Primary Teeth. OA Dentistry, 2: 1-6.

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