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Prevalence of Dental Anomalies (Mesiodens and Enamel Hypoplasia) Among Primary School Children in Badra/Iraq

Sanaa Rasheed Abd Al-Aaloosi[1], Maitha Sameer Kadhim[2], Basma Fathi Alanbari[3]

[1]Department of Prosthodontics, Al-Rafidain University College, Iraq, [2]Department of Preventive Dentistry, Al-Rafidain University College, Iraq, [3]Department of Periodontology, Al-Rafidain University College, Iraq

Abstract

Background: Dental anomalies considered as one of the developmental defects during teeth formation caused by both genetic and environmental factors which responsible for notable deviation from normal size, color, number, contour and developmental degree. The aim of this study was to determine prevalence of defect in number (hyperdontia or mesiodens teeth) and structural defect (enamel hypoplasia, localized and generalized,) among primary school children.

Material and methods: A cross sectional study that comprises data from 403 boys and 411 girls; a primary school students aged from 5-12 years with a total of 814 student; was conducted in Badra/ Iraq.

Results: The study shows a prevalence rate of a mesiodens from 814 students was 0.49% and it represented more frequently in males more than females with a ratio of 3:1. While, the prevalence of enamel hypoplasia was estimated to be 0.86 % among the observed population, it observed more in girls than in boys, with the proportion being around 1: 1.333 male: female ratio.

Conclusion: the prevalence of dental anomalies was found to be more in males than in females and most of the cases found in age group between 8-10 years old. Routine checkup for these anomalies during primary and mixed dentation which can help for early diagnosis and detection of these disorders that will help minimizing future complications and give well prognosis.

Key words: *prevalence, Dental anomalies, mesiodens, enamel hypoplasia.*

Introduction

Dental anomalies are brought about by both hereditary and environmental factors; the deformities in specific genes are the most compelling etiological factors in the prenatal and postnatal periods which responsible for abnormality in tooth measurement, morphology, position, number and structure [1, 2, 3].

Supernumerary teeth (Fig.1) are extra teeth in comparison to normal condition, is one of the developmental problems in children [4]. Mesiodens are one the most common type of these defects, it mostly present in the midline between the two central incisors [5]. It may occur as single, multiple, unilateral or bilateral. It happens in 82% of cases in the maxilla, specifically in the premaxillary district only a few numbers of studies have revealed the occurrence of mesiodens in the mandible [5, 6, 7]. The incidence of mesiodens in primary dentition is uncommon in contrast to permanent dentition [8], with a two-time risk of appearance in the male when compared to the female [9]. Morphologically; mesiodens may have various structures cone-like or peg structure, tuberculate and supplemental (tooth like) have been recorded, of which the cone form is the most popular [6, 10]. Mesiodens may erupt into oral cavity spontaneously or they stay impacted and not erupted, which intervene with permanent teeth eruption and may be give rise to malocclusion. In general, mesiodens may cause different types of oral problems such as malocclusion, impaction of food, aesthetics problems and formation of cyst [11, 12].

Corresponding author:
Sanaa Rasheed Abd Al-Aaloosi
E-mail: dr_sanaa77@yahoo.com

Enamel defects are divided into four forms which include: pit, plane, linear, and enamel hypoplasia (Fig.2). Enamel hypoplasia is one of structural abnormalities, caused by defect in formation of enamel matrix. Both primary and permanent teeth susceptible for this deformity [13]. It is two types, either hypo-mineralization, which is a diminution in mineral substance of tooth enamel or hypo-calcification, which is a distortion of tooth enamel in which normal amount of enamel are formed but hypo-calcified, in both types, the enamel is weak than normal [14- 16].

Studies have recommended that enamel hypoplasia, especially in anterior teeth, is related with poor esthetics; tooth sensitivity; malocclusion and susceptibility to dental caries [15, 17, 18].

Early identification and treatment of this anomalies is important to prevent malocclusion, delay eruption, function, esthetic and psychological problems.

The aim of this study was to determine the prevalence of defect in number, hyperdontia (mesiodens teeth) and structure defect enamel hypoplasia among primary school children in Badra- Wasit /Iraq. Data will be useful to evaluate the effectiveness of dental services and preventive programs among population in this small city.

Fig.1 Supernumerary tooth (mesiodens)

Fig.2 Enamel hypoplasia

Materials and Method

A cross sectional study that comprises data from 403 boys and 411 girls; a primary school students aged from (5-12) years with a total of 814 student; was conducted from (8) primary schools found in Badra city /Wasit governorate/Iraq. The total number of people population of that city was about 10000 people during time of examination. The examination was done by a well-trained dentist inspector and as a part of the governmental preventive program named "oral and dental care program" to control dental caries and enhance oral health among primary school children in whole of Iraqi cities after obtaining approval from the school administrations and the students' families for the examination.

The presence of mesiodens and enamel defect were recognized by direct visual assessment using a torch to enhance visualization and disposable dental mirror and probe for each child, radiograph not taken at this study because the field of survey was a classroom of school. All obtained data were statistically analyzed using Microsoft excel sheet to determine the mean and percentage of occurrence.

Results

According to this study, only four patients were recorded with a mesiodens from 814 students as shown in table 1 and 2 with a prevalence to be 0.49% of Badra's primary school children population (Fig. 3). It occurs more frequently in males more than females with a ratio of 3:1. All mesiodens seen was conical shape, single and concerning to position all mesiodens was palatal placed causing space between the central incisors.

The same tables show that the prevalence of enamel hypoplasia was estimated to be 0.86 % among the observed population (Fig. 3). It happened more much of the time in young female than in young male with approximately proportion being around 1: 1.333 male: female. Most of the anomalies found in age group (8-10) years as shown in table 1.

Table 1 distribution of study sample according to age

Age group	Male			Female			Total
	Mesiodens	Enamel Hypoplasia	Total	Mesiodens	Enamel Hypoplasia	Total	
5-7 years	0	0	80	0	0	78	158
6-8 years	0	0	77	0	0	87	164
7-9 years	0	0	71	0	2	75	146
8-10 years	3	2	59	0	2	77	136
9-11 years	0	1	73	1	0	57	130
10-12 years	0	0	43	0	0	37	80
Total	3	3	403	1	4	411	814

Table 2 prevalence of mesiodens and enamel hypoplasia observed

Types of Anomalies	Total cases examined	Males		Females		Total cases observed	
		N	%	N	%	N	%
Mesiodens	814	3	0.36855	1	0.1228	4	0.4914
Enamel hypoplasia	814	3	0.36855	4	0.4914	7	0.85995

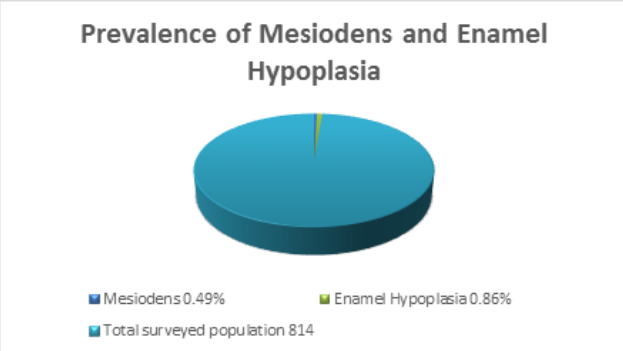

Fig. 3 Pie chart showing prevelance of mesiodens and Enamel Hypoplasia in Badra's primary school children popuation

Discussion

The present study was conducted for searching dental anomalies "mesiodens and enamel hypoplasia" from 814 primary school students in Badra which is small oil city in the middle and far East of Iraq.

The type of mesiodens found in this study was a single conical tooth found in the midline of the maxilla, with prevalence 0.49% of total sample, this finding is agreed with other studies like: Najm and Younis [19] in Missan governorate\Iraq 0.36%, Al-Nori & Talabani [20] in Baghdad city\Iraq which was 0.4% and Abdullah [21] in Anbar governorate (Fallujah city)\Iraq 0.3%, and less than the prevalence of other studies that reported by Sirkis [22] in AlRadwaniya village in Baghdad which was 0.93% , Bashir [23] in 2006 in Khartoum 7.4% and Peedikayil et al [6] in India 0.71%.

According to this study the male to female ratio was 3:1 which is agreed with Peedikayil et al [6], Rajab and Hamdan [10] and Najim and Younis [19]. The findings of the present study are disagreed with Abdullah [21] which found male to female ratio of about 1:1.67 and Najm et al [24] where they found a ratio of 1:3 male to female.

The differences in prevalence of mesiodens teeth in this population as compared to other studies may be due to variation in age of study group, sample size, location of study and nutritional status in addition to that in this study no radiograph was taken so impacted mesiodens were excluded.

The main causes of mesiodens still unclear; but it was suggested to have a genetic origin, higher rate of hyperdontia have been noticed between related families [25].

Treatment choice includes normal extraction of extra tooth at early of mixed dentition so as to encourage facilitate spontaneous eruption and alignment of the incisors, which may be reduce the need for orthodontic treatment [5]. Authors suggested that "postponed remove of mesiodens tooth about the ten of age when the central incisor apex almost forms may complicate the treatment plan in which intricate surgical and orthodontic treating may be needful ". Therefore early detection permit the most suitable treatment. [26].

For enamel hypoplasia, the result of the present study found a prevalence of (0.86 %) among the surveyed population which considered less than prevalence of enamel hypoplasia in studies done in different areas in Iraq as they found a percentage of (9.04%) in Fallujah [21]; (6.61%) in Mosul [27]; (5.8%) in Al-Radwaniya [22]; (2.07%) in Sulimania [28] and 2.04% in Missan [19]. The findings of this study were also less than other several studies done in different countries which was found (21%) according Enwonwu [29], (6%) of children examined had enamel hypoplasia as stated by Slayton et al [30] in Iowa, USA .

In this study enamel hypoplasia found more recurrent in girls than in boys, with male: female ratio 1: 1.333. There is a controversy in the enamel defect prevalence in relation to the gender, many studies show that there is no significant difference in the prevalence of enamel defect between males and females (Slayton et al [30]; and Soviero Soviero et al [31]). Other studies recorded greater prevalence among males than females (Mallivlle [32]; Steinberg & Luckas [38]), while another studies show the opposite as a higher prevalence of enamel defect found among females as compared to males (Al-Nori &Al-Talabani [20].

The presence of enamel defects may be attributed to local factor such as trauma or infection to the primary tooth which leads to development of defect in permanent successor [34], in addition to general factors such as systemic diseases, like "chickenpox, measles , hypocalcemia, congenital syphilis, and may be due to birth injury or premature birth" [35]. On other hand the prevalence of enamel defects may be increases with increasing levels of fluoride ingested [36]. Rugg-Gunn recorded that "boys of 14 years classed as malnourished, by height for age percentage had a higher prevalence of enamel defects than those classed as well-nourished" [37]. Hover, the deficiency of vitamin D has been reported as a cause of enamel hypoplasia [38]. Psychological stress during tooth development may be associated with defect of enamel and enamel hypoplasia [39].

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