



Prevalence of Developmental Anomalies and Oral Habits Among School Going Children of Pune, Maharashtra

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Abstract

Background: Developmental anomalies and oral habits are usually the accidental findings in school children. Early diagnosis and intervention can prevent the morbidity produced by them.

Aim: To estimate the prevalence of developmental anomalies and oral habits among the school going children of Pune, Maharashtra.

Method: This cross-sectional study included 1080 children in the age range of 8-12 years, studying in Zila Parishad Primary Schools of Pune, Maharashtra, India. The dental examination was conducted by a single well-trained and calibrated pedodontist in day light. The teeth were examined in wet condition. Mouth breathing was conformed using mirror and water tests.

Statistical Analysis: All the analyses were carried out using Statistical Package for Social Sciences (SPSS ver 21.0, IBM Corporation, USA) for MS Windows. The inter-group statistical comparison of distribution of categorical variables was tested using Chi-Square test.

Results: The most prevalent developmental anomaly was MIH-8.3% followed by hypodontia-3.4%. The most prevalent habit seen was Nail biting-14.4% followed by mouth breathing-6.6% and bruxism-2.6%. Except for microdontia, no statistically significant difference was observed in the prevalence of various developmental anomalies and habits between males and females.

Conclusions: Developmental dental anomalies and deleterious oral habits are of common occurrence in school going children. Timely screening of school children, early diagnosis and prompt management of these anomalies and oral habits is highly imperative before it complicates proper form, esthetics and functioning of stomatognathic system. The data obtained from this study may act as a baseline to plan community dental care for these children.

Keywords: Developmental Dental Anomalies; Oral Habits; Prevalence of Developmental Dental Anomalies

Introduction

Developmental dental anomalies and oral habits are not uncommon findings during routine oral health check-up in Pediatric population [1]. The anomalies may be localized or generalized and/or involve other orofacial regions as well [2]. They may be present alone or as a part of any systemic disorder or syndromes. The cause of these developmental anomalies is complicated as multiple factors, either genetic or environmental or both may be involved.

Different dental anomalies can occur at various stages of oro-facial development [3].

Oral habits are repetitive behaviour in the oral cavity that can result in changes in the stomatognathic system [4]. Oral habits may be functional or parafunctional [5]. Functional habits helps in normal functions of the body. These include chewing, articulation swallowing and nasal breathing [5]. Parafunctional or deleterious habits are non functional or unnecessary in nature include digit

sucking, tongue thrusting, mouth breathing, nail biting, lip biting and bruxism [6]. Their effect is dependent on the nature, onset and duration of habits [4].

Oral habits beyond the age of primary dentition may result in permanent structural changes in the stomatognathic system, which may lead to malocclusions and orofacial deformities [7,8]. Timely recognition and identification of the developmental dental anomalies is of utmost importance to control and to an extent reverse the morbidity produced by them. Ignorance of these developmental dental anomalies as well as deleterious oral habits can result in esthetic, malocclusion, functional and speech problems. The present study aims to evaluate the prevalence of developmental dental anomalies and oral habits in 8-12 years old children from the school population of Pune, Maharashtra.

Material and Methods

This school based cross sectional study was conducted at Zila Parishad Primary Schools from Pune, Maharashtra. The study sample was selected from the school-based dental health care programmes in the age range of 8 to 12 years. Students with written parental informed consent without any history of medical and systemic illnesses were included in the study. A closed-ended questionnaire was developed and through the school authorities, the child's parents were requested to fill it. This was done to investigate the habits like bruxism, mouth-breathing, nail biting and thumb sucking. A single, well-trained Pedodontist in the classroom under natural light using a dental mirror and a blunt ended probe carried out the comprehensive clinical examination. The findings were recorded in a recording proforma. Study sample examined included 1080 children. Mouth breathing was confirmed using mirror and water tests. Bruxism was recorded via examination of abnormal wearing of cusps and incisal edges of posterior and anterior teeth respectively.

Exclusion criteria

Those children who refused to sign the written consent were excluded. Patients with cleft lip and palate and with other syndromes such as Down's syndrome, ectodermal dysplasia etc and patients having dental fluorosis were excluded from the study. Children with unerupted or missing teeth were also excluded as some developmental anomalies and habits manifest mostly on the specific teeth.

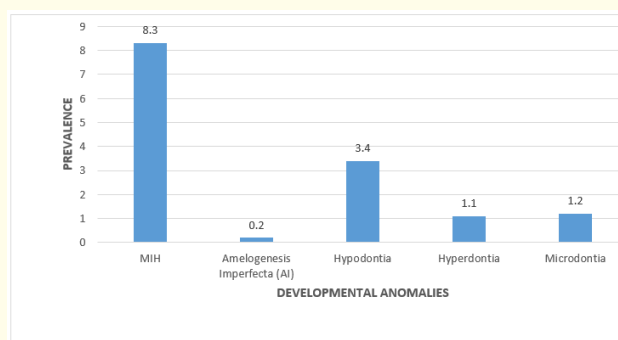
Statistical analysis

The collected data was recorded in MS excel sheets and subjected to statistical analysis. The entire data was statistically analyzed using Statistical Package for Social Sciences (SPSS ver 21.0, IBM Corporation, USA) for MS Windows. The inter-group

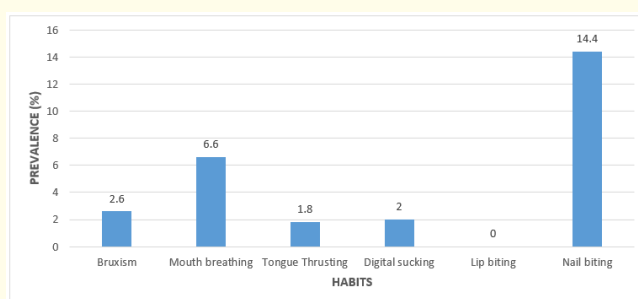
statistical comparison of distribution of categorical variables was tested using Chi-Square test.

Results

- Distribution of the Study Sample:** The sample included 1080 children in the age range of 8-12 years. Seventy per cent children were in the age group of 8-10 years. Gender distribution of sample population revealed 562 (52%) males and 518 (48%) females (Table 1).
- Prevalence of various developmental anomalies:** The prevalence of various developmental anomalies in decreasing order was Molar incisor hypomineralization (MIH) seen in 8.3%, hypodontia in 3.4%, microdontia in 1.2%, hyperdontia in 1.1% and amelogenesis imperfecta in 0.2% of the study sample (Graph 1). Except for microdontia, males and females showed similar distribution of developmental anomalies ($p > 0.05$) (Table 2).
- Prevalence of various oral habits in school children of Pune:** The prevalence of various habits in decreasing order was nail biting 14.4%, mouth breathing 6.6%, bruxism 2.6%, digital sucking 2%, tongue thrusting 1.8% and lip biting 0%. On comparison of distribution of various habits according to sex, similar distribution of various habits was found between the males and females (p -value > 0.05) (Table 3, Graph 2).



Graph 1: Prevalence of various developmental anomalies in Pune school children.



Graph 2: Prevalence of various habits in Pune school children.

Age (years)	Male (n=562)		Female (n=518)		Total (n=1080)	
	n	%	n	%	n	%
8-year	123	21.9	120	23.1	243	22.5
9-year	111	19.8	105	20.3	216	20.0
10-year	163	29.0	143	27.6	306	28.3
11-year	106	18.8	101	19.5	207	19.2
12-year	59	10.5	49	9.5	108	10.0
Total	562 (52%)	100	518 (48%)	100	1080	100.0

Table 1: Age and sex distribution of subjects examined.

Developmental Disorders	Male (n=562)		Female (n=518)		P-value
	N	%	N	%	
MIH	49	8.7	41	7.9	0.63 ^{NS}
Amelogenesis Imperfecta (AI)	0	0.0	2	0.4	-
Hypodontia	17	3.1	19	3.6	0.68 ^{NS}
Hyperdontia	5	0.9	6	1.2	0.23 ^{NS}
Microdontia	12	2.1	1	0.2	0.004 ^{**}

Table 2: Distribution of developmental anomalies according to sex.

Habits	Male (n=562)		Female (n=518)		P-value
	N	%	N	%	
Bruxism	17	3.1	11	2.1	0.160 ^{NS}
Mouth breathing	30	5.4	41	7.9	0.091 ^{NS}
Tongue Thrusting	9	1.6	10	1.9	0.775 ^{NS}
Digital sucking	13	2.3	9	1.8	0.160 ^{NS}
Nail biting	86	16.6	69	13.3	0.442 ^{NS}
Lip Biting	0	0	0	0	-

Table 3: Distribution of various habits according to sex.

Discussion

The choice of Zila Parishad Primary Schools from Pune for selection of study sample was done as they enrol mainly the children of Pune and therefore the sample selected was a good representative of the child population of Pune as well as Maharashtra.

Developmental anomalies and habits though most of the time are accidental findings but they are not uncommon [1]. They

can be commonly seen during routine dental examination or as a manifestation of other orofacial problems [1]. Dental anomalies develop at the tooth formation or maturation stage, and are often acquired by inheritance. The effect of the dental anomalies may lead to functional, aesthetic and occlusal problems [9].

MIH is a qualitative defect in mineralization of teeth resulting due to disturbance occurring during the maturation stage of enamel formation. It is a global phenomenon with a pooled prevalence of 14.2% as reported by Zhao, *et al* [10]. In literature, the prevalence of MIH has been reported in the range of 0.48–40.2% [11,12]. MIH was the most common developmental Dental anomalies found in the present study with a prevalence of 8.3%. Similar prevalence rates have been reported by other Indian authors [13-16]. From India, Mishra [17] and Rai A, *et al*. [18]. have reported a higher prevalence of MIH. Lower prevalence rate of 0.48% has also been reported in literature [19]. The wide difference in the prevalence of MIH may be due to different diagnostic criteria used in various studies or there may be actual regional variation in the occurrence of MIH.

In the present study, amelogenesis imperfecta was the least prevalent developmental anomaly seen in 02 subjects (0.2% prevalence) which nears to the prevalence reported by Altug-Atac, *et al*. [20] (0.43%). Much lower prevalence has been reported by Anitha, *et al*. [21] (0.02%). Zero percent prevalence of such structural anomalies has also been reported in various studies [22-25].

Hypodontia is a developmental anomaly characterised by the lack of development of one or more teeth. In the present study, the prevalence of hypodontia was seen in 3.4% of the subjects. Lower prevalence has been reported by Anitha, *et al*. [21] (1.1%) but much higher by Guttal, *et al*. [2], who reported hypodontia as 10.6% of all of the anomalies examined in their study.

Microdontia involves teeth which are smaller than normal. Microdontia usually involves the maxillary lateral incisors and they are known as "Peg-Laterals". The prevalence of this condition ranges from 0.8% to 8.4% [26]. The present study reported microdontia in 1.2% of the subjects with males (2.1%) being more affected than the females (0.2%) with a statistically significant difference ($p < 0.05$). Lesser prevalence has been reported by, Anitha, *et al*. [21] in 0.65% of their study sample. Higher prevalence has been reported by Katharia, *et al*. [1] (4.3%) and Guttal, *et al*. [2] (9.14%).

Hyperdontia is the presence of extra teeth in addition to the teeth in the normal dentition. The additional teeth are called as

supernumerary teeth. Literature reports prevalence of hyperdontia in the range of 0.1 to 3.8% [27]. In the present study, hyperdontia was seen in 1.1% subjects, which was in consonance to Anitha, *et al.* [21] who reported it in 1.12% of the subjects. Gupta, *et al.* [3] reported a higher prevalence rate of 2.40%. Altug- Atac [20] showed a lesser prevalence of 0.36%.

Deleterious habits can be harmful to the stomatognathic system. These habits have a direct influence on the quality of life and can affect the normal functioning of the stomatognathic system of the body [7]. They can also be considered as a manifestation of distress or emotional instability in children. Therefore, early diagnosis and proper intervention of these habits is imperative to avoid abnormalities.

The prevalence of all the habits in the present study did not show any statistically significant gender difference, which is in consonance as reported by Dhull, *et al.* [5]. Nail biting followed by mouth breathing and bruxism were the most common habits in the present study. Basra, *et al.* [28] also reported Bruxism and mouth breathing as the most commonly observed habits. Most of the studies have reported Tongue thrusting and mouth breathing as the most prevalent habits [4,29-31]. Dhull, *et al.* [5] reported lip biting followed by bruxism and thumb sucking as the most common habit. Quashie-Williams, *et al.* [32] reported digit sucking as the most frequent habit in children.

The wide range in the prevalence of various habits may be due to the difference in the age groups and methodologies selected. They may also be due to cultural and environmental influences [5].

Prevalence of bruxism in the present study was 2.6%. Higher prevalence has been reported by Garde, *et al.* [6], Liu, *et al.* [33], Reding, *et al.* [34] and Farsi, *et al.* [35] in their studies.

Mouth breathing is one of the etiological factors, which can cause alterations in normal growth of face [36]. Presence of this habit is associated with high incidence of malocclusion [37]. Early diagnosis and proper intervention of this habit should be done to avoid abnormalities. In the present study, 6.6% of the children had the habit of mouth breathing which was similar to that reported by Garde [6] (4.3%). Higher prevalence have been reported by Amr Abou-El-Ezz, *et al.* [37] and Dhull, *et al.* [5] in their studies.

Tongue thrust habit can be a cause of open bite. Other problems associated with tongue thrusting could be difficulty in speech

especially the words involving 'S' and 'Z' sounds. In the present study, tongue thrust was seen in 1.8% subjects. This is lesser when compared to reports in other studies by Shetty and Munshi [38], Basra, *et al.* [28], Gauba, *et al.* [29] and Kharbanda [30].

Digital sucking is one of the most frequently reported deleterious oral habit [29,32]. Its prevalence decreases as the age increases, seen less commonly in children more than 4 years of age. Continuation of the habit in permanent dentition may prove detrimental. Anterior open bite, increased overjet, lingual inclination of lower incisor and labial inclination of upper incisor are common sequelae. In the present study, digital sucking was observed in 2% subjects which is lesser than reported by Shetty and Munshi [38] and Kharbanda, *et al.* [30]. The lesser prevalence in the present study may be due to higher age of the sample selected in our study.

Nail biting can lead to a multitude of problems such as malocclusion of the anterior teeth, intestinal parasitic infections, change of oral bacterial flora, infection and alveolar destruction, temporo-mandibular joint pain and dysfunction [39]. In the present study, nail biting was seen in 14.4% of the subjects and more in boys. Similar prevalence has been reported by Bhayya DP [31] (16.3%).

Lip biting habit was absent among the subjects examined in the present study which is in consonance with the findings of Sharma, *et al.* [4] and Garde, *et al.* [6]. Bhayya DP [31] has reported the prevalence of lip biting as 0.1%. Dhull, *et al.* [5] reported a higher prevalence of lip biting habit (13.4%) in preschool children.

Conclusion

The results of this study indicate that developmental dental anomalies and deleterious oral habits are of common occurrence in school going children. These are frequently not reported by the patients and parents due to their asymptomatic nature. By the time these are diagnosed, the skeletal and dental changes secondary to them may have already occurred. Hence, timely screening of school children, early diagnosis and prompt management of these anomalies and oral habits is highly imperative before it complicates proper form, esthetics and functioning of stomatognathic system. The data obtained from this study may act as a baseline to plan community dental care for these children. Multicentre cross sectional studies with a larger sample size are recommended to further substantiate the findings of this study.

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