

Prevalence of Developmental Dental Anomalies – A Clinical Study

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ABSTRACT

Introduction: Developmental dental disturbances are striking aberrations from the normal size, number, colour, contour and degree of development of teeth. Knowledge of common dental anomalies is essential because these disturbances of teeth contribute to dental problems encountered in regular practice. Aim of this study is to assess the prevalence of developmental dental anomalies in size, shape, number and structure of the teeth in patients.

Material and Methods: The study was conducted during a period of 4 months on patients who visited the department of oral medicine and radiology. The patients were clinically examined for various developmental dental anomalies. Statistical analysis used: A descriptive analysis was done.

Results: In 7,018(100%) patients, 181 (2.52%) patients presented with developmental dental anomalies, out of which 79 (1.12%) had supernumerary teeth, 50(0.71%) microdontia, 40 (0.56%) enamel hypoplasia, five (0.07%) talon's cusp, two (0.02%) each of fusion, amelogenesis imperfecta, hypodontia and one (0.01%) each of gemination, dens evaginatus were observed. Supernumerary teeth and microdontia were more common.

Conclusion: Developmental dental anomalies are commonly seen during routine dental check-up. These anomalies lead to functional, aesthetic and occlusal problems and thus require appropriate diagnosis and treatment.

Keywords: amelogenesis Imperfecta, Developmental Anomalies, Microdontia, Prevalence, Supernumerary Teeth

INTRODUCTION

Dental anomalies are commonly seen during routine dental check-up.¹

The factors leading to developmental abnormalities can be either genetic or environmental. It has been recognized that a growing number of genes have been linked with early tooth morphogenesis.²

The recognition and identification of the developmental dental anomalies are of great importance for a timely and accurate diagnosis of the numerous genetic abnormalities. Management of dental anomalies is more complicated, because they can result in esthetic problems, malocclusion, and oral disorders.^{3,4}

Hence, the present study aims to evaluate the prevalence of developmental dental anomalies in Indian population.

MATERIAL AND METHODS

A prospective study was conducted during a period from May 2016 to August 2016. A comprehensive clinical examination was carried out to identify developmental dental anomalies relating to number, size, structure and shape of the teeth. This study comprised of 7,018 subjects, with age ranging

from 10-70 years.

Inclusion criteria

1. Subjects of Indian origin

Exclusion criteria

1. Subjects with misshaped teeth due to wasting diseases and dental treatment
2. Subjects with teeth missing due to dental caries, periodontal disease and trauma
3. Subjects with history of extraction or orthodontic treatment.

STATISTICAL ANALYSIS

A descriptive analysis was done with the help of Microsoft office 2007.

RESULTS

Age: In the present study, mean age was found to be 28.01years. Out of 7,018 (100%) subjects, 3,663 (52.19%) were males and 3,355 (47.80%) were females.

Dental anomalies: Out of 7,018 (100%) subjects, 181 (2.52%) presented with dental anomalies.

Distribution of dental anomalies: Out of 7,018 (100%) subjects, 81 (1.15%) had dental anomalies in number, 50 (0.71%) had dental anomalies in size, 42 (0.59%) had dental anomalies in structure and eight (0.11%) had dental anomalies in shape.

Dental anomalies in number: Mesiodens were the most common dental anomaly in number, followed by paramolar, distomolar and hypodontia.

Dental anomalies in size: Peg laterals were the most common dental anomaly in size followed by microdontia.

Dental anomalies in structure: Enamel hypoplasia was the most common dental anomaly in structure followed by amelogenesis imperfecta.

Dental anomalies in shape: Talon's cusp was the most common dental anomaly in shape followed by fusion, gemination and dens evaginatus.

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Gender	Number	Percentage
Males	3,663	52.19%
Females	3,355	47.80%
Total no. of subjects	7,018	100%

Table-1: Gender

Total no. of subjects	7,018 (100%)
Subjects with dental anomalies	181 (2.52%)

Table-2: Total sample size

Dental anomaly	No. of subjects	Percentage
Number	81	1.15%
Size	50	0.71%
Structure	42	0.59%
Shape	8	0.11%
TOTAL	181	2.52%

Table-3: Distribution of dental anomalies

DISCUSSION

Dental anomalies develop earlier than the eruption of dentition, and are often hereditarily.¹

Age - in the present study, mean age was found to be 28.01 years.

Gender - Out of 7,018 (100%) subjects, 3,663 (52.19%) were males and 3,355 (47.80%) were females [Table 1]. The prevalence rate of different developmental anomalies was assessed. Out of 7,018 (100%) subjects, 181 (2.52%) presented with dental anomalies [Table 2]. The prevalence of number anomalies was greater than the prevalence rate of the shape, structure and size.

Peg lateral demonstrated the highest incidence rate and microdontia was the second most common anomaly among all the groups, while the rarest were gemination and dens evaginatus [Table 3].

Hypodontia - denotes the lack of development of one or more teeth. In our study it was noted to constitute 1.1% of the entire dental anomaly, which was in contrast to the study conducted by Guttal et al, who showed a higher prevalence rate of 10.6%.⁴ This could be attributed due to the differences in the sample size.

Hyperdontia is the development of an increased number of teeth, and the additional teeth are termed supernumerary. In our study, supernumerary teeth were 1.12% out of 7018 subjects, and were mostly in the maxillary arch. However, the frequency of mesiodens was highest being 0.44%. Paramolar accounted for 0.38%, which was followed by distomolar with 0.29%. These results were in par with the study conducted by Gupta et al which showed a prevalence rate of 2.40%.⁵ The prevalence of supernumerary teeth is between 1 – 3% with slight higher rate in Asian population, with a strong predilection for anterior region.⁶ Study conducted by Altug-Atac showed a prevalence of 0.36% of hyperdontia.⁷

These dissimilarities can be attributed to differences in sampling techniques, inclusion criteria and study design.

However, the eruption of the accessory teeth is variable and dependant on the degree of space available. 75% of the supernumerary teeth fail to erupt in the anterior maxilla.

Microdontia refers to teeth which are smaller than normal. One of the common forms of localized microdontia is that which affects the maxillary lateral incisors, a condition that has been called as the 'peg lateral'. Our study also revealed increased frequency with respect to tooth-size discrepancy, being the second most prevalent dental anomaly.

Out of 7,018 subjects with dental anomalies, 0.65% of subjects had peg lateral and 0.05% had microdontia of the molars. The findings of a study conducted by Guttal et al showed a prevalence of 9.14%.⁴ A study conducted by Brin et al and Ooshima et al showed a prevalence rate of 0.3% and 8.4% respectively.^{8,9} The significant difference between the prevalence could be due to the variations in the age group factor, sample size, selected population and local environmental factors. It has also been reported that these alterations appear to be autosomal dominant with incomplete penetrance, and hence the conflicting results.⁶

Enamel hypoplasia is a defect in the matrix of enamel; most commonly reported among malnourished and low birth weight children. The present study gave a percent prevalence of 0.56% out of 7,018 subjects. However, the prevalence of enamel hypoplasia in study conducted by Dummer Pmh et al was 48.9%, Jindal et al was 7.7% and Kanchanakamol et al was 31.9%.^{10,3,11} The differing prevalence figures for the developmental defects of enamel could be attributed to the hereditary factor, differences in the population which were studied and the diversity of methodological procedures which were followed.

Amelogenesis imperfecta is a developmental alteration in the structures of enamel in the absence of systemic disease. In the present study, amelogenesis imperfecta was the rarest in occurrence with the overall prevalence rate of 0.02% of total sample size 7,018. According to the study conducted by various authors such as Thongdornporn (1998), Uslu (2009), Ghaznawi (1999), Ezoddini (2009), Backman (2001) and also by Guttal (2010), zero percent prevalence of structural anomalies was reported in their studies.^{12,13,14,15,16,4} Per contra, in a study conducted by Altug-Atac et al (2005) among Turkish population, amelogenesis imperfecta was the third most common dental anomaly with a prevalence of 0.43%.⁷ The disparity in prevalence could have been due to the hereditary factors and clustering of affected patients in certain geographic areas resulting in an increased prevalence of disorder in those areas. Additionally, the stringency of the diagnostic criteria may influence the reported prevalence in any study.⁶

Talon's cusp, an anomalous structure resembling an eagle's talon, projects lingually from the cingulum areas of maxillary or mandibular permanent incisors. In our study, the prevalence of talon's cusp is 0.05%. This anomaly had greater predilection for maxilla, where in maxillary central incisors and canines were more commonly affected. A

similar study conducted by Gupta et al showed a prevalence of 0.97%, which is in par with our study.⁵ However, a study conducted by Sedano et al showed a prevalence rate of 0.6 per 1000, and Ardakani et al showed a prevalence of 1.2% with a positive family history in most of these patients.^{17,2}

Fusion of teeth arises through union of two normally separated tooth germs. It is seen more commonly in deciduous dentition than the permanent dentition. Fusion in our study accounted for 1.10% and gemination constituted of 0.55% out of all dental anomalies. Fusion was observed to be unilateral. However, a study conducted by Guttal et al showed a prevalence of 4.85% of fusion and 0.28% of germination in their total dental anomalies.⁴ The prevalence of fusion and gemination is based on geographic, genetic and racial factors, leading to significant differences in various studies.⁴

Dens evaginatus primarily affects the molars, canine and incisors. In premolars and molars, the anomaly is usually seen over the occlusal surfaces. In our study, dens evaginatus comprised of 0.55% of total dental anomalies and showed a considerable difference between the study conducted by Guttal et al who showed a prevalence of 2.85%.⁴ It has been thought to develop only in persons of Mongoloid ancestry: Chinese, Japanese, Filipinos, Eskimos, and American Indians.¹⁸

In the present study, the following observations were made:

1. The prevalence of dental anomaly was more in males than in females.
2. The most prevalent dental anomaly was in number. The most common being supernumerary teeth - mesiodens.
3. The second most prevalent dental anomaly was in size. The most common being microdontia - peg laterals.
4. The third most prevalent dental anomaly was in structure, which included enamel hypoplasia followed by amelogenesis imperfecta.
5. The fourth most prevalent dental anomaly was in shape which included talon's cusp followed by fusion, gemination and dens evaginatus.

These variations in developmental dental disturbances highlight the need for establishing data from various geographical regions to examine the effect of genetics and environment on dental development.

CONCLUSION

Developmental anomalies of teeth are clinically evident abnormalities. They can result in pathologies and also present as esthetic challenges. Meticulous examination and suitable investigations are necessary to diagnose the disturbance and deliver proper management.

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