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C O D S



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Prevalence and distribution of dental anomalies and fluorosis in a small cohort of Indian school children and teenager

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Abstract:

Objective: The purpose of this study was to determine the prevalence of developmental dental anomalies and fluorosis in small cohort of Indian school children & teenagers.

Method: A total of 473 school children and teenagers (250 female & 223 male) of 6 - 17 years were examined clinically for developmental anomalies of teeth such as peg lateral, supernumerary teeth (mesiodens), and talon's cusp. Children were also examined for dental fluorosis.

Result: On examination 1.47% of the sample population, had at least one developmental dental anomaly. Prevalence of Peg lateral, Mesiodens, and Talon's cusp was 0.63%, 0.63% and 0.21% respectively while 87.9% showed fluorosis induced enamel hypoplasia.

Conclusions: the most common dental anomalies was Peg lateral and Mesiodens. The present study also emphasizes the need for de-fluoridation of water in the region, because of high incidence of enamel hypoplasia induced by fluorosis in the study group. Other developmental dental anomalies also differed in prevalence from previous reports, pointing to a possible ethnic variation.

Keywords: Dental anomalies, peg lateral, mesiodens, talon's cusp, enamel hypoplasia, fluorosis.

Introduction:

Dental anomalies of teeth are not uncommon. Abnormalities of tooth size, shape, number and structure occur due to disturbance in the development of teeth caused by genetic and environmental factors during the morpho-differentiation or histo-differentiation stages of development.¹ Although many studies show that hereditary factors are involved in the aetiology.²

It is important to treat these anomalies as they can lead to clinical problems which include delayed or incomplete eruption of teeth, occlusal interference, accidental cusp fracture, compromised esthetics, interference with tongue space causing difficulty in speech and mastication, temporomandibular joint pain and dysfunction, malocclusion, periodontal problems

because of excessive occlusal force and increased susceptibility to caries.^{3,4}

Several studies reported variation in the frequency among the prevalence of dental anomalies in different countries and their results are conflicting. The discrepancies in the results could be due to racial differences, variation in sample technique and diagnostic criteria.⁵⁻⁸

However, a study representing the South Indian ethnic group has not been done so far. Therefore this study was aimed at establishing the prevalence and distribution of various dental anomalies in a sample South Indian population of school children and teenagers.

A conservative approach to restore teeth with both direct and indirect restorations has been introduced by various authors.^{3,4} The clinical case presented in this article represents a rediscovered philosophy of adhesive and cosmetic dentistry.

Methodology:

This study was conducted on a total of 473 school children in Davangere district. 250 females and 223 males aged 6-17 years were examined clinically for developmental anomalies of teeth.

The following diagnostic criteria were used for the identifying most common dental anomalies as follows:

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Peg shaped lateral: Any upper lateral incisor demonstrating a reduction in its mesiodistal crown diameter in a cervico-incisal direction⁹.

Mesiodens: A supernumerary tooth present in the premaxilla between the two central incisors. Morphologically it may be cone shaped or tuberculated¹⁰.

Talon's cusp: A prominent accessory cusp like structure projecting incisally from the cingulum area of an incisor¹¹.

Dental Fluorosis: is a hypoplasia or hypomineralization of the tooth enamel or dentin produced by the chronic ingestion of excessive amounts of fluoride during the period when teeth are developing. Depending upon the level of fluoride in the water supply, there is wide range of severity in the appearance of mottled teeth¹².

Results:

Among the 473 (250 female and 223 male) school children examined, 1.47% (7) had developmental anomalies. The distribution by sex was 1.8% (4) in males and 1.2% (3) in females. (Table 1)

Out of 473 only one male patient had a Talon's cusp, peg shaped incisor was seen in one male and two females while mesiodens was seen in two males and one female. Prevalence of Peg shaped incisor, mesiodens and Talon's cusp was 0.63% (3), 0.63% (3) and 0.21% (1) respectively in the present study. Fluorosis induced enamel hypoplasia showed a prevalence of 87.9% (416).

Discussion:

The occurrence of dental anomalies between our study and previous epidemiological studies showed little difference. These conflicting results could be explained primarily by racial difference and sampling technique as well as by local environmental factors and nutrition.

Previous studies have found the prevalence of Peg lateral to be 0.33% and 1.51%.^{13,14} while our study showed 0.63%. These variations are mostly the result of racial and ethnic differences between populations.

Mesiodens are the most common supernumerary teeth seen in maxillary anterior and are usually responsible for the eruption disturbance like delay in eruption of the maxillary anterior permanent teeth.¹⁵

The prevalence of mesiodens varies between 0.09% and 2.05% in different studies and it is reported to be more common in males than in females.¹⁶ These results are similar to findings of the present study where a prevalence of 0.63% and a male to female ratio of 2:1 was seen. On the contrary, it was not in accordance to a study by Khandelwal V et al, where prevalence of mesiodens was observed to be 3.18%¹⁵.

Talon's cusp is a rare dental anomaly in which a cusp-like

mass of hard tissue protrudes from the cingulum area of maxillary or mandibular anterior teeth. Incidence is higher in permanent dentition, though talon's cusp can also be observed in primary dentition.¹⁷⁻¹⁸ The prominent bulge of a talon's cusp may cause interference with occlusion or may result in accidental cusp fractures causing pulpal exposure.¹⁸ In present study only one male subject showed a talon's cusp on palatal aspect of upper central incisor (0.21%) which is similar to the findings of Tulunoglu O et al who reported a prevalence of 0.04%-10%⁴. Few prevalence studies have been reported in Mexican¹⁹ (0.6%), Malaysian²⁰ (5.2%), North India²¹ (0.65%) and South Indian²² (0.58%), populations. The prevalence of talon's cusp in the present study was found to be 0.21%. The variation in the talon's cusp prevalence could be explained by variation of the geographic condition among different countries or within a same country or variation in the sample studied or the study design or technique employed.

In present study fluorosis induced enamel hypoplasia showed a prevalence of 87.9% (416). The study group consisted of children with mixed dentition and teenagers with permanent dentition. The mixed dentition showed increase involvement by enamel hypoplasia in significant number as more permanent teeth erupting as seen with increase in age. The difference in severity of dental fluorosis between the two dentitions has been attributed to placental barrier preventing the passage of fluoride^{23, 24} or by the shorter duration of enamel formation and maturation of deciduous dentition²⁴⁻²⁶.

Conclusion:

- We found that
- 1.47% of the children in the group of 473 had at least one developmental dental anomaly.
 - Mesiodens and peg shaped incisor were the most common developmental dental anomalies followed by Talon's cusp.
 - High incidence of enamel hypoplasia induced by fluorosis was observed in the present study (87.9%). This emphasizes the need for de-fluoridation of water in the region. The remaining 12.1% of the subjects not showing fluorosis could be explained possibly by family transfer from areas with low or optimum fluoridation.
 - The discrepancies in the results could be due to racial differences, variation in sample technique and diagnostic criteria.
- Similar study with larger sample and uniform diagnostic criteria could help in predicting the prevalence of developmental dental anomalies.

Table 1: Age and sex wise distribution and prevalence of developmental dental anomalies and flourosis:

Age group (in years)	No. of patients		Peg lateral		Mesiodens		Talon's cusp		Fluorosis induced enamel hypoplasia		No abnormality	
	Male	Female	Male n(%)	Female n(%)	Male n(%)	Female n(%)	Male n(%)	Female n(%)	Male n(%)	Female n(%)	Male n(%)	Female n(%)
6 - 8	25	34	0	1(0.21)	1(0.21)	0	0	0	2(0.42)	3(0.63)	23(4.8)	31(6.5)
9 - 11	26	21	0	0	0	1(0.21)	1(0.21)	0	23(4.8)	21(4.4)	3(0.63)	0
12 -14	123	105	0	0	0	0	0	0	123(26)	105(22.2)	0	0
15 -17	49	90	1(0.21)	1(0.21)	1(0.21)	0	0	0	49(10.3)	90(19)	0	0
Total	473		3 (0.63)		3 (0.63)		1(0.21)		416(87.94)		57(12.05)	

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