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Prevalence of Dental Anomalies in Rural Area of India, Modinagar

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Abstract

The prevalence rates of selected dental anomalies were determined clinically and radiographically among 1,029 dental patients of rural area of India, Modinagar. Results showed that hyperdontia was the most prevalent (29.5082%) followed by peg laterals, Taurodontism, fusion, talons cusp. Other anomalies were found at lower frequencies ranging from 3.22% for microdontia. Comparing these results with other studies showed that these anomalies occur at different frequencies among various countries and communities in the world.

Keywords: Dental anomaly, Taurodontism, Prevalence

Introduction

Anomaly is the 'irregularity' or 'different from normal. There is a broad classification of Dental anomalies according to shape size number and size. The form, size and colour of teeth as well as their eruption times in humans show wide, normal and biological variations within and among different populations of the world.

Abnormal variations, however, do occur and in many cases, these are due to genetic, environmental and pathological factors. According to Sarnat and Schour, [1] the growing tooth is a biological recorder providing a precise and permanent record of variations and fluctuations in the tooth matrix and its mineralization. These anomalies may be localized to one tooth or generalized to involve all the teeth or they may be part of systemic or syndromic disorders[2].

Developmental anomalies of the dentition are not infrequently observed in the dental clinic. However, while these anomalies account for a relatively low number compared to the more common oral disorders such as dental caries and periodontal diseases, their clinical management is usually complicated as they present with malocclusion, esthetic problem, and possible disposition to other oral diseases..

Many epidemiological surveys have been conducted in different parts of the world to determine the prevalence of various types of dental anomalies.[3,4,5,6,7] These earlier results have shown that there are regional and ethnoracial variations in the prevalence of dental anomalies. Most of the reported data on congenital dental anomalies are case reports of missing teeth, supernumerary teeth, fused teeth, talon cusps, and others. Since many of these studies were conducted without radiographic assessment, the prevalence of some abnormalities such as hypodontia and supernumeraries may have been underestimated in some of them. Early identification of a treatable anomaly is important in planning comprehensive management of the young child. It is important for every practitioner to know the relative frequency of anomalies in his/her locale in order to counsel those who may have any of these anomalies and who may seek treatment.

This paper presents the results of a clinical and radiographic survey of anomalies of tooth number and morphology in a rural population of in and around Modinagar.

Materials and method

The study consisted of both clinical and radiographic examinations. A dental mirror, probe,

standard dental light and chair were utilized during the comprehensive clinical examination.

Total of 1029 subjects aged 3-11 year were included in the study. The investigation was conducted during routine dental treatments of children attending the Department of Pedodontics and Preventive Dentistry at D J College of Dental Sciences & Research Modinagar. The absence of teeth normally expected to be erupted, and the presence of erupted supernumerary teeth, were determined by counting the erupted teeth in the arch. The sizes of the teeth were morphometrically determined by clinical, radiographic and study models. Only gross deviation in sizes easily discernible by clinical judgement were accepted. Talon cusps and fused teeth were identified by their characteristic shapes. Radiographic examination was done on panoramic views of the jaws, periapical and occlusal views of the anterior teeth. The radiographs were read on a dental viewer. Only abnormalities occurring anterior to the first permanent molars were included. For Taurodontism - Only the 1st and 2nd permanent molars teeth were assessed for this trait. This was done morphometrically according to the method of Seow and Lai 1989.[8] Briefly, the crown-body (CB) and the root length (R) were measured along a vertical axis drawn perpendicular to the occlusal plane of the tooth. The CB:R ratios were then calculated to determine the presence or absence of the trait.

The data was statistically analyzed using Z- test.

Results

The total prevalence of dental anomaly was 5.92% in the population in and around Modinagar.

The prevalence of hyperdontia (fig 1) was highest at 29.5% followed by Peg laterals(fig.2) at 26.23%, partial anodontia and Taurodontism(fig.3) at 9.83%, fusion(fig.4) at 8.13% and talons cusp(fig5) at 6.55%. The mesiodens was found to be highly prevalent in hyperdontia. (Table1)

The most common anomaly is supernumerary tooth as it is occurring most frequently by (29.5082 %) among all kind of anomalies. By applying Z test for proportion, to test the significant difference of supernumerary teeth with all other anomalies, a significant difference was observed at 1% level of significance ($p < 0.01$) except peg laterals ($p > 0.01$) (Table 2) If sample size would have been greater than 5000 instead of 1029, the number of anomalies were approximately 300 divided into its various kinds and the number of anomalies were to be significant as well as the precision would also be increased. (Approx 6%) A strong significant correlation was observed between mesiodens and peg laterals ($r = .8123$) anomalies at 1% level of significance, i.e., ($p < .01$) while a weak positive (not significant) correlation was observed for mesiodens and peg laterals with all other anomalies, i.e., ($p > .01$)

Discussion

The data of the present study were collected from Rural area of India, Modinagar, who attended Paedodontic and Preventive dentistry department of D J College of Dental Sciences & Research Modinagar. Caution was taken in extrapolating the results of the present survey to larger population. However, data such as these can serve as an indicator of dental anomalies in the larger community and how they may affect the overall pattern of dental treatment provided in the community. In this survey, the prevalence rate of most commonly occurring dental abnormalities was examined. While the prevalence of these abnormalities are quite low compared to other common oral and dental disorders such as dental caries and periodontal diseases, they

present a challenge to the practitioner as they may complicate the treatment of common dental diseases.

Hyperdontia occurred at the highest rate of 29.35%. Hyperdontia is any tooth or odontogenic structure that is formed from a tooth germ in excess of the usual number for any given region of the dental arch. [9]. Hyperdontia is classified according to shape into conical, tubercle, odontome and supplemental. According to number it has been classified into single and multiple. In our study there were two cases were found with multiple supernumerary teeth, which were found after taking the occlusal radiograph (figure 1).According to location the hyperdontia were classified as mesiodens, paramolars and distomolars. In the study the most prevalent dental anomaly found was mesiodens at 29.35%. Our figure is higher than that reported by Salem (0.37%) [10] in Gizan and the Nigerian figure of 1.4% reported by Onyeaso [11], and near to 2.3 % reported by Albashireh in Jordan [12]. The reported prevalence of supernumerary teeth in the permanent dentition of Caucasians is between 0.15% and 3.9%[13,14] and it appears to be highest among the Mongoloid racial group, with a reported frequency higher than 3%.[15].In the primary dentition the prevalence ranges from 0.2% to 0.8% for Caucasians,[13] while a prevalence rate of 2.8% and 7.8% have been reported for populations in Hong Kong and Taiwan[15] respectively.

The second most common anomaly found in the survey was Peglaterals (Fig2)

Our figure of 26.23%% for peg-shaped lateral incisors is higher than the figure of 0.37% reported by Salem

1989[10] in Gizan, Saudi Arabia and 0.33% reported by Clayton 1956[11] in USA but lower than the Nigerian figures of 1.70% and 1.50% reported by Adeniji 1993[11] and Sawyer et al 1984,[5] respectively.

The prevalence rate of Taurodontism was found to be 9.85% .Taurodontism is an aberration of teeth that lacks the constriction at the level of the cementoenamel junction characterized by elongated pulp chambers and apical displacement of bifurcation or trifurcation of the roots, giving it a rectangular shape, coined by Sir Arthor Kieth in 1913 [8]. This was the third most common anomaly in the group with a prevalence figure of 8.61%. There was no gender predilection, but more cases were found in the maxillary molars compared to the mandibular molars. The current opinion on the aetology of this anomaly is that it results from a failure of the infolding of epithelial rootsheath of Hertwig - the structure involved in root development and growth[16]. Goldstein and Gotlieb [17] suggested that lack of bridge formation in this root-forming structures of furcated teeth prior to dentin deposition would result in a large pulp chamber. findings fall within the reported prevalence rate of 0.09 - 40% in different communities of the world. [16,18] Condition does not require any specific therapy but the shape of pulp chambers frequently increases the difficulty of locating, instrumenting, and obturating the pulp canals. Hence the diagnostic radiographs for early identification of a taurodonts are very important so that the preventive care to those teeth should be given.

Data from this study and their comparison to other studies showed that different dental anomalies occur with different frequencies in many countries of the world and even within the same country among different ethnic or regional groups. While the overall prevalence of each of these anomalies in the dental clinic or population group may be low, their presence may, in some cases create a management problem or complicate treatment options for patients. Therefore, their diagnosis and management are of importance for general patient management.

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Legend Tables &Figures

Table 1: Percentage of various dental anomalies

Anomaly	% Age
Mesiodens	29.5082 %
peg laterals	26.2295%
Taurodontism	9.8361%
Fusion	8.1967%
Talon cusp	6.5574%
Microdontia	3.2787%
Anodontia	9.8361%
Supernumerary root	6.5574%

Table 2: Statistical analysis of dental anomalies

S. No.	Pair of Anomalies	Z Cal	Z .01	P value
1.	Mesiodens – peg laterals	1.983	2.58	P > .01
2.	Mesiodens – taurodontism	5.8321	2.58	P < .01
3.	Meriodens – fusion	4.9831	2.58	P < .01
4.	Mesiodens – talon cusp	7.99	2.58	P < .01
5.	Mesiodens – microdontia	8.11	2.58	P < .01
6.	Mesiodens – anodontia/ hypodontia	5.8321	2.58	P < .01
7.	Mesiodens – supernumerary root	7.991	2.58	P < .01

Figure 1: Occlusal radiograph showing multiple supernumerary teeth

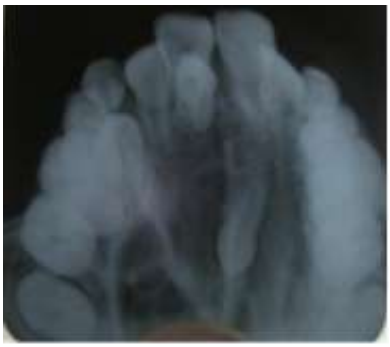

Figure 2: Intraoral view showing peglaterals

Figure 3: OPG showing Mesotaurodont of deciduous molars.

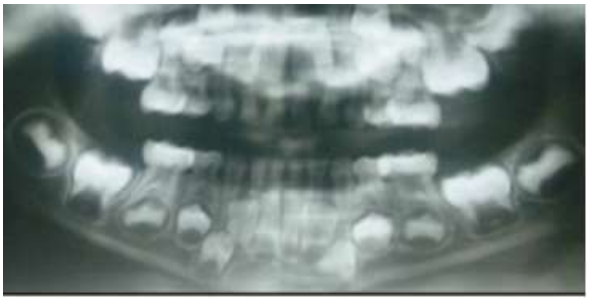

Figure 4: Intraoral view & periapical radiograph Bilateral fusion of primary lateral with canine

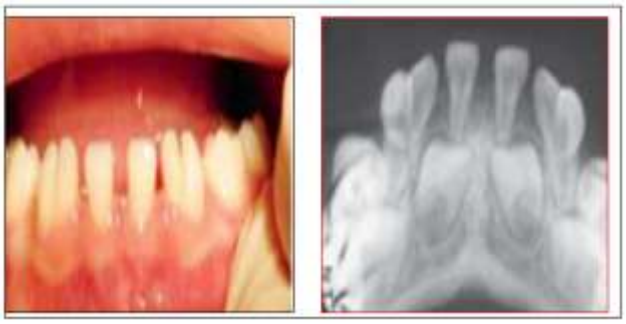

Figure 5: Intraoral view showing Bilateral talons cusp