



RESEARCH ARTICLE

PREVALENCE OF TOOTH ANOMALIES IN DECIDUOUS DENTITION IN INDIAN CHILDREN FROM RURAL NAGPUR REGION

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ABSTRACT

**Background:** Dental anomalies in deciduous dentition are commonly encountered by dental professionals. Early detection and careful management of such conditions can help in usual occlusal development. The aim of this study was to determine the prevalence of dental anomalies in deciduous dentition among Indian children from rural population.

**Materials and Methods:** The study sample comprised of 2809 children from 2-8 years (1641 boys, 1168 girls). The children were examined in outpatient department of Pedodontics and Preventive Dentistry. Based on the clinical and radiographic examination various anomalies were determined.

**Results:** The dental anomalies were observed in 42 children in a population of 2809 with an overall prevalence rate of 1.5% with double teeth (0.5%) and hypodontia (0.6%), the most frequently observed anomaly. The other anomalies followed as 0.2% supernumerary teeth, 0.07% microdontia, 0.1% talon cusp.

**Conclusion:** Identification of dental anomalies at an early age is of great importance as it prevents malocclusions, functional and certain psychological problems.

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INTRODUCTION

Any disturbance in the morpho-differentiation stage of tooth development leads to developmental anomalies of the teeth. Dental anomalies related to number and morphology may occur in both primary and permanent dentition (Grahnen, 1961; Järvinen, 1981; Nik-Hussein, 1996; Whittington, 1996; Marinelli et al., 2012). The most common of these is malformation in the structure of enamel and dentine. Apart from these, there can also be anomalies in the size, number, and shape of teeth.

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The anomalies of size can be in the form of microdontia, characterized by marked reduction in the size of the tooth compared to others and macrodontia, larger size tooth in comparison with others. Both these conditions, i.e., anomalies in size may be either generalized to all the teeth or isolated to one or several teeth. The differences in the number of teeth can be either decrease (hypodontia, oligodontia, and anodontia) or increase in the number, supernumerary teeth. Shape alterations of teeth include double teeth (fusion and gemination), talon cusp, dens evaginatus, and dens invaginatus (dens in dente) (Kapdan et al., 2012; Stecker et al., 2007). Compared to the more common oral diseases such as dental caries and periodontal diseases, these anomalies account for a relatively low number, but can pose a problem during treatment planning. They present with malocclusion, esthetic and functional problem, and possible

disposition to other oral diseases. Hence, their clinical management is usually important and complicated (Afify *et al.*, 2012). According to Sarnat and Schour (2000), the growing tooth acts as a biological recorder which provides a precise and permanent record of variations and fluctuations in the tooth matrix and its mineralization. These anomalies may be involving one tooth or generalized to involve all the teeth or they may be present as a part of any systemic disorders or syndromes. Routine radiographic and clinical examination may reveal these dental anomalies. The present study determines the presence of various developmental anomalies through clinical and radiographic examination in the deciduous dentition in a sample of Indian children of rural Nagpur.

## MATERIALS AND METHODS

The study was conducted among patients aged 2 to 8 years visiting Department of Pedodontics and Preventive Dentistry, Swargiya Dadasaheb Kalmegh Smruti Dental College and Hospital, Nagpur. Ethical clearance was obtained from the Institutional ethical committee. Purpose of the study was explained to the parents of the patients and informed consent was obtained. All patients attending the outpatient department were screened for the presence of anomalies. A comprehensive clinical examination was carried out to identify the presence of any tooth anomalies such as hyperdontia, hypodontia, talon cusp, double teeth, gemination, concrescence, dens invaginatus, dens evaginatus, macro- and microdontia and taurodontism in the deciduous dentition. A total of 2809 children (1641 boys and 1168 girls) participated in the study over the 18 month period.

### Exclusion criteria

- Patients with syndromes such as Down's syndrome, ectodermal dysplasia, etc.
- Patients having cleft lip and palate.

### Clinical examination

A single examiner carried out the examination in a systematic manner using a plain mouth mirror and a probe. The assessment of the dental anomalies representing variations in tooth size, morphology, and number were recorded according to the criterion given by Kreiborg *et al.* (1994)

- Local microdontia: Single tooth smaller than normal;
- Fusion: Union in dentin and/or enamel between two or more separately developed normal teeth;
- Gemination: Incomplete division of a tooth germ;
- Hypodontia: Absence of one or only a few teeth;
- Hyperdontia: Presence of a supernumerary tooth.

Because the clinical distinction between fusion and gemination is difficult, these were grouped under the term "double teeth" as suggested by Carvalho *et al.* (1998)

## RESULTS

The dental anomalies were observed in 42 children in a population of 2809 with an overall prevalence rate of 1.5%.

**Table 1. Distribution of various dental anomalies gender wise**

	Total	%	Male	%	Female	%
Anomalies	41	1.5%	24	0.9%	17	0.6%
Supernumerary	05	0.2%	04	0.14%	01	0.04%
Hypodontia	17	0.6%	11	0.39%	06	0.21%
Double teeth	14	0.5%	08	0.28%	06	0.21%
Microdontia	02	0.07%	00	00	02	0.07%
Talons cusp	03	0.1%	01	0.04%	02	0.07%

**Inference:** The distribution of anomalies was found to be 0.9% and 0.6% in boys and girls respectively. Hypodontia and double teeth were most common observed anomalies.

**Table 2. Distribution of the anomalies archwise**

	Upper	Lower	unilateral	Bilateral
Supernumerary	05	00	04	01
Hypodontia	09	08	07	10
Double teeth	11	03	14	00
Microdontia	02	00	01	01
Talons cusp	01	02	03	00

**Inference:** The dental anomalies were found to be more commonly present in the maxillary arch compared to the mandibular arch and unilateral in nature.

## DISCUSSION

In the present study, dental anomalies in the primary dentition as a whole were found to be around 1.5% of the sample screened. Only a few studies have been published with the reference to the dental anomalies in the primary dentition with a variable prevalence ranging from 0.5 to 7% as reported by Grahnen and Granath (1961), Kapdan, (2000) Menczer (1955), Magnusson (1984), Jones *et al.* (1993) A wide range in the prevalence may be due to the differences in the methodology and the study population. In the present study, boys showed higher anomalies than girls as similarly observed by Salcido-garcia (Salcido-garcia *et al.*, 2004). We found 0.6% of sample of children had hypodontia and 0.5% double teeth collaborating with the findings of Carvalho *et al.* (1998) and Brook (2004). Jorgenson, (1980) stated that hypodontia to be a common trait in the modern population followed by fused teeth. The prevalence was found to be higher in boys than girls though not statistically significant which was in accordance with Paulo Floriani Kramer, Kapdan *et al.* (2012) Lateral incisor bilaterally was the most common tooth involved with no preference to maxillary or mandibular arch. Hypodontia in primary dentition frequently presented with hypodontia in succedaneous permanent dentition as observed by Marinelli<sup>5</sup>, Brook (1970), Kramer (2008) but a contrasting possibility was put forth by Marinelli *et al.* (2012) stating that hypodontia in primary dentition not be followed by hypodontia in permanent dentition owing to the complex multifactorial etiology.

The prevalence of hyperdontia/supernumerary teeth was found to be 0.2% in the current study. Range of 0.07 to 1.7% was observed by Chen (2010), Brook, (1970) Kapdan, (2012) Ravn, (1971), Magnusson (1984), Yonezu, (1997) in the primary dentition. Supernumerary teeth are the teeth additional to those of the normal series. It has been reported in the literature as most commonly observed in the maxillary anterior region (Grahnen *et al.*, 1961; Ravn, 1971; Hagman, 1988; Gellin, 1984; Järvinen, 1981; Luten, 1967). In the present study, the supernumerary teeth observed were conical in shape and frequently present in the midline region. Salcido- Gracia<sup>15</sup> reported a higher prevalence in males than females and the same was noted in the present study. It is reported that children with supernumerary in primary dentition may present with similar condition in the permanent dentition (Grahnen, 1961; Järvinen, 1981; Whittington, 1996; Ravn, 1971) but a contrasting view was put forth by Marinelli *et al.* (2012) that supernumerary of primary dentition are not to be considered as risk factor for hyperdontia in the permanent dentition. Supernumerary and agenesis of teeth was observed by Ranta simultaneously more often in permanent dentition than in primary dentition (Ranta, 1988). Double teeth is a collective term used for germination and fusion. In the present study a prevalence of 0.5% of double teeth was observed in the primary dentition. The location of fused teeth (Grahnen, 1961; Clyton, 1956) i.e maxillary anterior region and the unilateral occurrence of teeth (Grahnen, 1961; Whittington, 1996; Jones *et al.*, 1993; Ravn, 1971) collaborate with the previous findings. The central incisor and lateral incisor were the fused teeth most commonly observed. The double teeth usually affect the esthetics, may lead to crowding and difficulty in eruption of

adjacent teeth. Management of asymmetry is the most important aspect of treatment. Double teeth is more prevalent in primary dentition than in the permanent dentition with no sex predilection (Marinelli *et al.*, 2012). Gomes *et al.* (2014) stated that there is less than 50% chance of this condition to be mimicked in the permanent dentition. However, there is a strong relationship associating fusion of primary teeth and hypodontia in the permanent dentition (Marinelli, 2012). Microdontia is characterized by a marked reduction in the diameter of the tooth crown. The findings of the study suggest a prevalence of less than 0.1% compared to other studies with prevalence ranging from 0.1 to 0.6% (Carvalho, 1998; Kramer *et al.*, 2008; Yonezu *et al.*, 1997; Clyton, 1956). Yonezu *et al.* (1997) discussed exclusively microdontia in canine. Very limited data is available with respect to microdontia in primary dentition. This may be due to the possibility that diagnosis is done on the evaluation of crown size which may cause subjective errors. The term talon cusp was described by WH Mitchell 1892 (Mitchell, 1892). Talon cusp is describe as an anomalous hyperplasia of the cingulum of the maxillary and mandibular incisors resulting in the formation of supernumerary cusp resembling an eagle talon with predilection in permanent dentition than the deciduous dentition (Clyton, 1956; Shafer, 1983). In the present study, the rate of prevalence of Talon's cusp was found to be 0.1% with unilateral predilection involving one central incisor and lateral incisor in each of the cases. Sedano *et al.* (1989) reported a prevalence of 0.06% in Mexican children. Guttal *et al.* (2010) reported a high prevalence of 4.28% with semi talon. Early diagnosis of this entity is important so as to prevent complications such as occlusal interferences, dental caries, compromised esthetics, accidental cusp fractures, attrition and periodontal diseases.

## Conclusion

The prevalence of dental anomalies in primary dentition may represent a risk factor for the recurrence of the anomalies in permanent dentition. The prevalence studies help in early recognition of dental anomalies in primary dentition which helps us plan preventive and interceptive treatment for the future as direct intervention may not be required in primary dentition. The present study was a subset of a bigger population providing information of prevalence of some dental anomalies. Further studies are required on a larger Indian population.

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