

Prevalence and Characteristics of Supernumerary Teeth in Pediatric Population of North East India

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ABSTRACT

Background: Teeth may vary in number, size, and shape. Supernumerary teeth are a developmental anomaly of the number which may involve both primary and permanent dentitions.

Objectives: The objectives of the present study were to determine the prevalence of supernumerary teeth in the pediatric population of Manipur in North East India and to study the characteristics of supernumerary teeth.

Study Design: Observational study.

Materials and methods: The study was carried out in children from 3 to 14 years of age. Four thousand thirty-two children were examined over a period of 6 months who reported to the Department of Paediatric and Preventive Dentistry, Dental College, Manipur. Children with only supernumerary teeth were included whereas children with syndromes which are known to be predisposed to supernumerary teeth were excluded. The clinical and radiographical examination was done for diagnosis. Demographic details (age and sex) of children and characteristics of supernumerary teeth were noted.

Results: Out of 4032 children examined, supernumerary teeth were detected in 36 children (0.9%). Males were affected more than females with a male:female ratio of 2.3:1. Maximum supernumerary teeth were seen in mixed dentition (66.6%). About 86.1% of children had only one supernumerary tooth. 92.7% of supernumerary teeth were located in premaxilla. Conical shape was the most predominant (65.8%). 75.6% supernumerary teeth erupted while 24.3% were impacted. The majority were oriented straight (87.8%) with complete crown and root formation (80.4%).

Conclusion: The prevalence of supernumerary teeth was found to be 0.9% with the most common location being the premaxilla. Maximum supernumerary teeth were erupted and had straight orientation.

Keywords: Dental anomalies, Mesiodens, Supernumerary teeth.

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INTRODUCTION

Dentists may encounter various developmental anomalies of teeth. The supernumerary tooth is a dental anomaly of the number which may be defined as teeth present in excess of a normal set of teeth¹. Supernumerary teeth may be present in any area of the dental arches but usually, are seen in the maxillary anterior region. The exact etiology of supernumerary teeth is not completely known, but various theories have been put forward which include dental lamina hyperactivity theory, the dichotomy of tooth bud, atavism theory, heredity, and environmental factors. According to dental lamina hyperactivity theory development of supernumerary teeth is the result of local, independent and conditioned hyperactivity of dental lamina². This is the most accepted theory.

Supernumerary teeth may be diagnosed either clinically when a spontaneous eruption has occurred or radiographically as a chance finding or as the cause of displaced or impacted permanent teeth. They may remain in position in jaws without disturbing adjacent teeth or may cause complications such as non-eruption or delayed eruption of permanent teeth, malocclusion like crowding or midline diastema and formation of cysts with bone destruction and root resorption of adjacent teeth³.

Literature shows that various studies conducted in different parts of the world have reported the different prevalence rate of supernumerary teeth. There is no such study done in the pediatric population of North East India. The present study was undertaken to determine the prevalence and investigate the characteristics

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of supernumerary teeth in the pediatric population of Manipur in North East India.

MATERIALS AND METHODS

A cross-sectional observational study was carried out which included children with the age range of 3 to 14 years who reported to the Department of Paediatric and Preventive Dentistry, Dental College, Manipur in North East India. The objective of this study was to determine the prevalence and characteristics of supernumerary

teeth. Ethical approval for was obtained from Institute Ethical Committee (IEC) and informed written consent was obtained from the parents of children. A total of 4032 children were examined over a period of 6 months from 1st June to 30th November 2016. The study included children in deciduous, mixed and permanent dentition. Reasons for visiting included caries, malocclusion, lack of eruption of permanent teeth and routine dental check-up. Supernumerary teeth were diagnosed following the clinical and radiographical examination. Periapical, occlusal and panoramic radiographs were taken. All the radiographs were reviewed and inter-examiner discrepancies were resolved by mutual consensus. For each child with supernumerary tooth/teeth, we recorded demographic details (age and sex). Characteristics of supernumerary teeth were noted which included the number, location, type, morphology, eruption status, and orientation. Development of supernumerary teeth was assessed and recorded as either crown formation only, crown and partial root formation or complete tooth formation. Since there are increased chances of occurrence of supernumerary teeth in some syndromes like cleidocranial dysplasia, Gardner's syndrome, cleft lip, and palate, thus children with syndromes were excluded from this study. Data obtained were statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 16.0. Descriptive analysis was done (frequency distribution and cross-tabulation). Chi-square test was used to compare qualitative data and determine the statistical significance. The level of significance was set at $p \leq 0.05$.

RESULTS

The prevalence of supernumerary teeth in the pediatric population of Manipur in North East India was found to be 0.9% (36 in 4032). Out of 36 children who had supernumerary teeth, 25 were males and 11 were females (male: female ratio was 2.3:1) (Table 1) ($p = 0.037$). Maximum supernumerary teeth were seen in mixed dentition (66.6%, $n = 25$) (Table 2). A total of 41 supernumerary teeth were observed in 36 children. Out of these 41 supernumerary teeth, 7 were primary teeth, and 34 were permanent teeth.

Table 3 shows the characteristics of supernumerary teeth. In 86.1% of children ($n = 31$), only one supernumerary tooth was observed and in 13.8% ($n = 5$) children two supernumerary teeth were observed. However, children with 3 or more supernumerary teeth were not observed. Most of the supernumerary teeth (92.6%, $n = 38$) were located in the maxillary arch while only 7.3% ($n = 3$) were located in the mandible. 92.7% ($n = 38$) supernumerary teeth were located in the premaxilla. Out of these, 48.7% ($n = 20$) were in midline (mesiodens) and remaining 43.9% ($n = 18$) were located in maxillary incisor region. This was followed by supernumerary teeth

Table 1: Distribution of patients with supernumerary teeth according to gender

Gender	Number of patients with supernumerary teeth $N = 36$
Male	25
Female	11

Table 2: Distribution of patients with supernumerary teeth according to type of dentition

Type of dentition $N = 36$	Number of patients with supernumerary teeth
Deciduous dentition	7
Mixed dentition	5
Permanent dentition	24

in the mandibular molar region (4.8%, $n = 2$) and mandibular incisor region (2.4%, $n = 1$). Most of the supernumerary teeth were conical in shape (65.8%, $n = 27$) followed by supplemental type (29.3%, $n = 12$), tuberculate (2.4%, $n = 1$) and odontome (2.4%, $n = 1$). Out of a total of 41 supernumerary teeth, 75.6% ($n = 31$) teeth erupted and only 24.3% ($n = 10$) were impacted in the arch. 87.8% of supernumerary teeth ($n = 36$) had straight orientation whereas 7.3% ($n = 3$) were inverted and 4.8% ($n = 2$) had distoangular orientation.

Out of 10 teeth which were impacted, 3 were inverted, 1 tooth had distoangular and 6 teeth had straight orientation (Table 4). It was observed that 80.4% supernumerary teeth ($n = 33$) were completely formed whereas 14.6% ($n = 6$) had only crown formation and 4.8% ($n = 2$) had partial root formation.

DISCUSSION

Supernumerary teeth are infrequent developmental anomalies that may manifest in any area of the dental arches. The present study was conducted to determine the prevalence and characteristics of supernumerary teeth in Manipuri children with the age range of 3 to 14 years. We chose 3 years as the youngest

Table 3: Characteristics of supernumerary teeth

Characteristics	Number	% age	
Number	One	31	86.1
	Two	5	13.8
Location	Maxilla	38	92.6
	Mandible	3	7.3
Type	Mesiodens	20	48.7
	Maxillary incisor region	18	43.9
	Mandibular molar region	2	4.8
	Mandibular incisor region	1	2.4
Morphology	Conical	27	65.8
	Supplemental	12	29.3
	Tuberculate	1	2.4
	Odontome	1	2.4
Eruption status	Erupted	31	75.6
	Impacted	10	24.3
Orientation	Straight	36	87.8
	Inverted	3	7.3
	Distoangular	2	4.8
Tooth formation	Entire tooth	33	80.4
	Only crown	6	14.6
	Partial root	2	4.8
Total	41	100	

Table 4: Correlation of orientation of supernumerary teeth with the eruption status

Type of orientation	Eruption status of 41 supernumerary teeth	
	Erupted ($N = 31$)	Impacted ($N = 10$)
Straight	30	6
Inverted	0	3
Distoangular	1	1

age since primary supernumerary teeth can be detected more accurately at this age.

Several studies have reported the prevalence of supernumerary teeth in different populations. Current data shows that supernumerary teeth are observed in 0.1 to 3.8% of the general population. In the present study, the prevalence was found to be 0.9% which falls within this range. Many studies have reported different prevalence rates of supernumerary teeth in different racial groups. The prevalence of supernumerary teeth in the Mongoloid population has been found to be 2.6% in China by King *et al.* and 3.4% in Japan by Niswander *et al.*^{4,5}. In the present study the prevalence of supernumerary teeth in Mongoloid children of Manipur in North East India has been found to be 0.9%. Interestingly this is similar to the prevalence reported in other parts of India which were 0.9% in study done by Mahabob *et al.* and 0.7% in study done by Saha *et al.* but lower as compared to 1.3% as reported by Sharma *et al.* and 2.97% as reported by Soni *et al.*⁶⁻⁹. The prevalence found in this study was found to be higher as compared to a study by Shilpa *et al.* who reported a prevalence of 0.21% in primary dentition¹⁰. Differences in the rate of prevalence in various populations may be due to differences in demographic and environmental factors and different sample size.

The incidence of supernumerary teeth has been found to be usually higher in males than females. Male to female ratio has been reported between 1.18:1–4.5:1¹¹. The present study showed male to female ratio of 2.3:1 which is in close agreement with a study done by Rajab *et al.*¹². Similar male predominance has been seen in various other studies^{8,9,11}. It has been suggested that the predominance of supernumerary teeth in males may be due to sex-linked inheritance.

The present study showed that supernumerary teeth are most commonly seen in mixed dentition (66.6%). A similar pattern is seen in other studies conducted with similar age groups^{8,13}.

Supernumerary teeth may be seen as either a single tooth or multiple teeth in any region of the dental arches in the same person. In the present study, 41 supernumerary teeth were reported in 36 children. 86.1% of children had one supernumerary tooth, and 13.8% of children had two supernumerary teeth. These observations are in support of other studies^{2,11,14,15}. However, the present study did not reveal more than two supernumerary teeth in any patient.

Regarding location, 92.6% of supernumerary teeth were found in the maxillary arch. This is similar to a study done by Gomes *et al.* who reported 91.3% of these teeth in the maxillary arch¹⁶. This finding is also in agreement with other studies¹⁷⁻²⁰. In this study maximum, supernumerary teeth were observed in premaxilla (92.6%) which is also seen in many other studies^{11,13,21}. In literature, the most common supernumerary tooth has been found to be mesiodens^{18,22,23}. Some authors consider that mesiodens is followed by distomolars, but other authors have found that mesiodens is followed by lateral incisors and premolars^{8,24}. In this study, the most common location of supernumerary teeth was the midline of the maxilla (48.7%). Second most common location was maxillary incisor area followed by mandibular molar area. Supernumerary teeth were found least commonly in mandibular incisor area in this study. The mandibular incisor area showed a prevalence of 2.4% which is similar to a study done by Yassin *et al.*².

Based on morphology supernumerary teeth are classified into supplemental, conical, tuberculate and odontome type. The

present study showed a conical form to be the most common morphological type (65.8%). This observation is in agreement with the literature^{16,25,26}. The conical form was followed by supplemental (29.3%), tuberculate (2.4%) and odontome (2.4%) type. The frequency of odontome form observed in this study was higher when compared to 0.51% reported by Aneundi *et al.* and lower as compared to 6.4% reported by Rajab *et al.*^{12,13}.

It was found in our study that 75.6% of supernumerary teeth erupted whereas 24.3% of teeth were impacted. In a study done by Aneundi *et al.* it was observed that 82.4% supernumerary teeth erupted whereas Sharma *et al.* and Arikan *et al.* reported 35% and 22.6% erupted supernumerary teeth respectively^{8,13,27}. In some studies where tooth position and type are correlated to the eruption, it has been observed that the possibility of eruption is higher with supplemental teeth in straight orientation²⁶. The present study has shown that 36 (87.8%) teeth had straight orientation. Other authors have reported similar rates of the eruption^{2,12}. Out of these 36 teeth, 30 erupted whereas only 6 teeth were impacted which included 2 supplemental types, 1 odontome, and 3 mesiodens. All three inverted teeth (root towards the oral cavity) found in this study were impacted. Out of two teeth which had distoangular orientation 1 was erupted and 1 was impacted.

When the development of supernumerary teeth was assessed, it was observed that 80.4% of teeth were completely formed whereas 14.6% teeth had only crown formation and only 4.8% of teeth had partial root formation. In a study done by Arikan *et al.* only 20.2% teeth were completely formed, and 48.8% teeth had shown the only crown formation²⁷.

Early diagnosis of supernumerary teeth may help to prevent or minimize possible complications particularly the displacement of surrounding teeth and failure of eruption of permanent teeth. Leyland *et al.* have recommended early removal of supernumerary teeth to facilitate spontaneous eruption of impacted permanent teeth²⁸. Some authors have the opinion that supernumerary teeth should be removed when detected to prevent the development of an acute infection. While others have the opinion that is not always mandatory to remove such teeth. It is generally recommended that supernumerary teeth that do not disturb normal dentition may be retained as long as these are asymptomatic, but their periodic follow-up is necessary^{4,29,30}.

Limitation of the Study

Although the present study provides first regional data on supernumerary teeth more studies are required to be conducted on a larger sample size which also includes a population of different city and hospital of northeast India.

CONCLUSION

The prevalence of supernumerary teeth in the pediatric population of Manipur was found to be 0.9% and is comparable to the prevalence reported in other parts of India. Male predominance was seen. Most common location for the occurrence of supernumerary teeth was maxillary incisor area, and conical form was the most common type. Maximum supernumerary teeth erupted in the dental arch. It is important that pediatric dentists plan appropriate management of supernumerary teeth to prevent the occurrence of orthodontic complications that can arise if supernumerary teeth are not diagnosed.

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