Prevalence of Various Developmental Dental Anomalies in Population of Hazaribag District, Jharkhand: A Hospital Based Study

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Abstract

Background: To investigate Developmental anomalies of teeth are clinically evident abnormalities. The effect of dental anomalies can lead to functional, esthetic and occlusal problems. Careful observation and appropriate investigations are required to diagnose the condition for appropriate treatment. The Purpose of the study was to determine the prevalence and distribution of selected developmental dental anomalies in Hazaribag population, Jharkhand.

Material and Methods: The study was based on clinical examination and radiograph of children who visited the OPD at Hazaribag College of Dental Sciences & Hospital, Hazaribag. These patients were examined for dental anomalies in size, shape, number, structure and position. Data collected were entered and analyzed for statically purpose.

Results: Of the 1000 subjects (500 Males, 500 Females) examined, 138 subjects (13.8%) presented with selected dental anomalies. On intergroup comparison, number anomalies was the most common anomaly with missing teeth (4.1%) being the most common anomaly. The Prevalence of size anomalies were Microdontia (1.0%) and Macrodontia (1.8%). The prevalence of Shape anomalies were Dilaceration (1.2%), Talon cusp (0.9%), Fusion (0.6%) & Taurodontism (0.7%).The prevalence of Positional anomalies were Ectopic eruption (0.5%) and Rotation (1.1%). The prevalence of structural anomalies were Amelogenesis imperfecta (0.6%) Dentinogenesis imperfecta (0.1%)

Conclusions: A significant number of subjects had dental anomaly with missing teeth being the most common anomaly and Dentinogenesis imperfecta being the rare anomaly in the study.

INTRODUCTION

The tooth is a specialized part of the human body, understanding the development of which is enigmatic and still challenging. The successful development of tooth depends on a complex reciprocal interaction between the dental epithelium and underlying ectomesenchyme. The interaction involves a complex series of molecular signals, receptors and transcription control systems.[1]

Dental anomalies arise due to genetic and environmental factors in the morpho differentiation stage of odontogenesis lead to alteration in the normal color, contour, size, number and degree of development of teeth.[2–4]

In industrialized countries, there are about 10% of children with developmental disturbances, whereas in developing countries like India their percentage is higher, ranging between 15% and 20%.[5]

Dental anomalies not only cause aesthetic problems but also can lead to dental problems such as functional disorders, dental caries, pulp disease, malocclusions and in particular masticatory problems for infants and children. If untreated, these may persist throughout life leading to physical growth disorder.[6]

This study was conducted to address the prevalence of dental anomalies in a group of Hazaribag population, with the possible existence of gender-based associations.

MATERIAL & METHOD

A prospective study was conducted during a period from January 2022 to January 2023. This study comprised of 1000 subjects (500 males & 500 females), with age ranging from 14-70 years. The clinical details including the patient's age, gender and selected anomalies were carefully checked, and recorded. A comprehensive clinical examination was carried out to detect the presence of selected dental anomalies related to number, size, structure and shape of the teeth. Digital orthopantomograms of these patients taken with orthopantomogram and were examined in a standard manner under good lighting conditions, standardized screen brightness and resolution. The clinical and radiographic examination were studied by the principal investigator to eliminate inter examiner differences.

Inclusion criteria

1. Subjects of Indian origin

Exclusion criteria

1. Subjects belonging to the pediatric age group (under the age of 14 years).
2. Subjects with history of extraction or orthodontic treatment.
3. Subjects with syndromes such as Down's syndrome, ectodermal dysplasia, etc.
4. Subjects having cleft lip and palate.
5. Subjects with misshaped teeth due to wasting diseases and dental treatment.
6. Subjects with teeth missing due to dental caries, periodontal disease and trauma.
7. Subjects with history of extraction or orthodontic treatment.

The diagnosis of oral anomalies was made according to the clinical criteria described by Shafer et al. in 2020.[7] A descriptive analysis was done with the help of Microsoft excel 2010.

RESULT

The study population composed of 1000 subjects with 500 males & 500 females. 138 children with a prevalence rate of 13.8 % had dental anomalies (Table1). The distribution by gender was 89 males (17.8%) and 49 females (9.8%). Distribution of dental anomalies according to shape, number, structural & position show in Table 2 & Graph 5.

Congenitally missing teeth 41 (4.1%) were the most common anomaly in this study (Graph 2). The most commonly missing teeth were mandibular second premolars followed by maxillary permanent lateral incisors. Macrodontia was the next common anomaly with the prevalence rate of 1.8% (Graph 1).

The prevalence of Shape anomalies were Dilaceration (1.2%), Talon cusp (0.9%), Fusion (0.6%) & Taurodontism (0.7%) (Graph 2). The prevalence of structural anomalies were Amelogenesis imperfecta (0.6%) Dentinogenesis imperfecta (0.1%) (Graph 3).The prevalence of Positional anomalies were Ectopic eruption (0.5%) and Rotation (1.1%) (Graph 4).

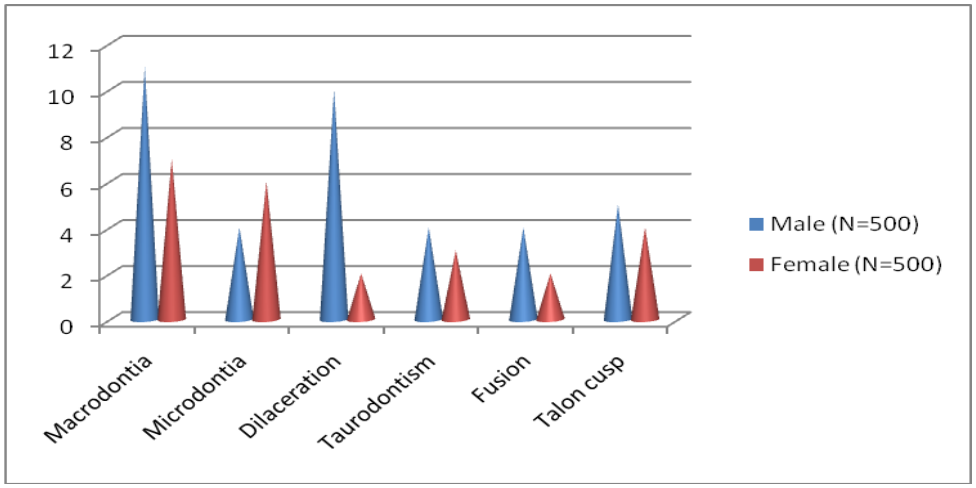
Table1: Prevalence of dental anomalies among the study population among the gender

Dental Anomalies	Male (N=500)	%	Female (N=500)	%	Total (N=1000)	%
Shape Anomalies						
Macrodontia	11	2.2	7	1.4	18	1.8
Microdontia	4	0.8	6	1.2	10	1.0
Dilaceration	10	2.0	2	0.4	12	1.2
Taurodontism	4	0.8	3	0.6	7	0.7
Fusion	4	0.8	2	0.4	6	0.6
Talon cusp	5	1.0	4	0.8	9	0.9
Number Anomalies						
Missing	25	5.0	16	3.2	41	4.1
Supernumerary	9	1.8	3	0.6	12	1.2
Structural Anomalies						
Amelogenesis imperfecta	4	0.8	2	0.4	6	0.6
Dentinogenesis imperfecta	0	0.0	1	0.2	1	0.1
Positional Anomalies						
Ectopic Eruption	4	0.8	1	0.2	5	0.5
Rotation	9	1.8	2	0.4	11	1.1
Total	**89**	**17.8**	**49**	**9.8**	**138**	**13.8**

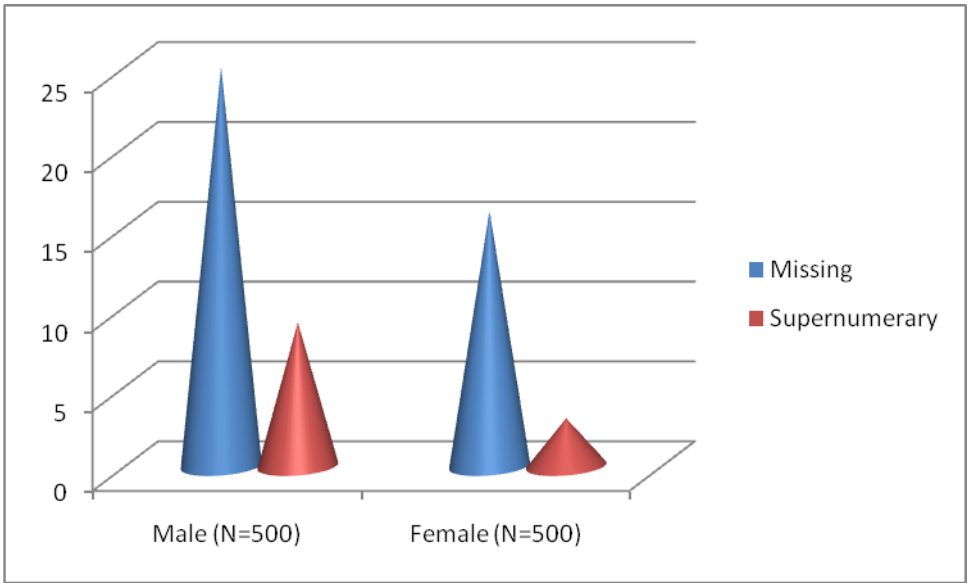
Table 2: Distribution of dental anomalies

Dental anomalies	No. of subjects (N=1000)	%
Shape anomalies	62	6.2
Number anomalies	53	5.3
Structural Anomalies	07	0.7
Positional Anomalies	16	1.6

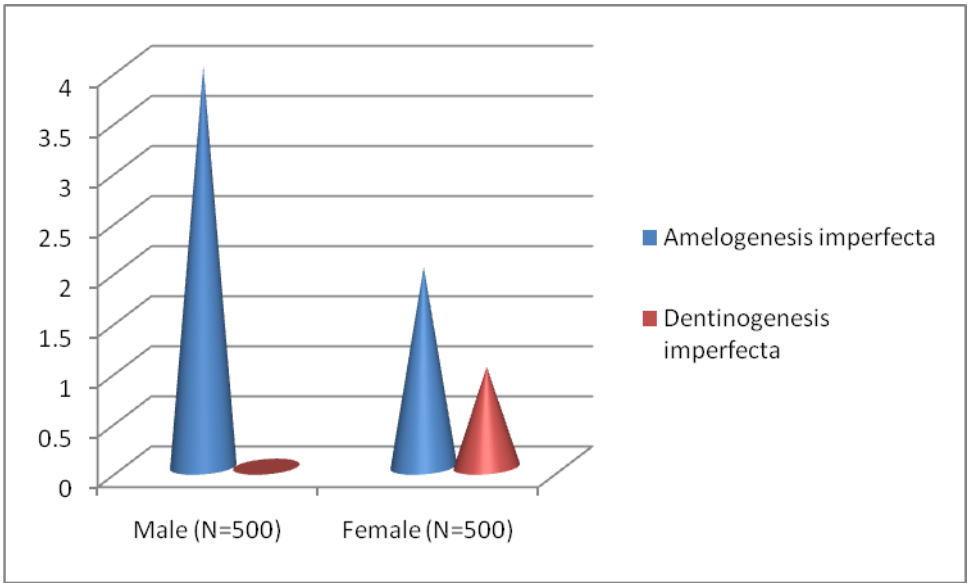
Graph1:Distribution according to shape of teeth anomalies



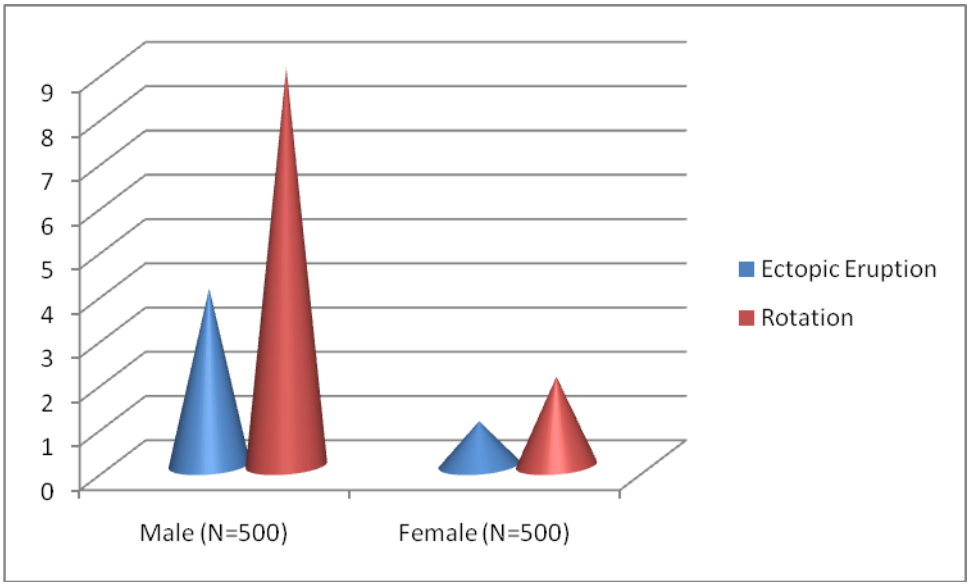
Graph2: Distribution according to number of teeth anomalies



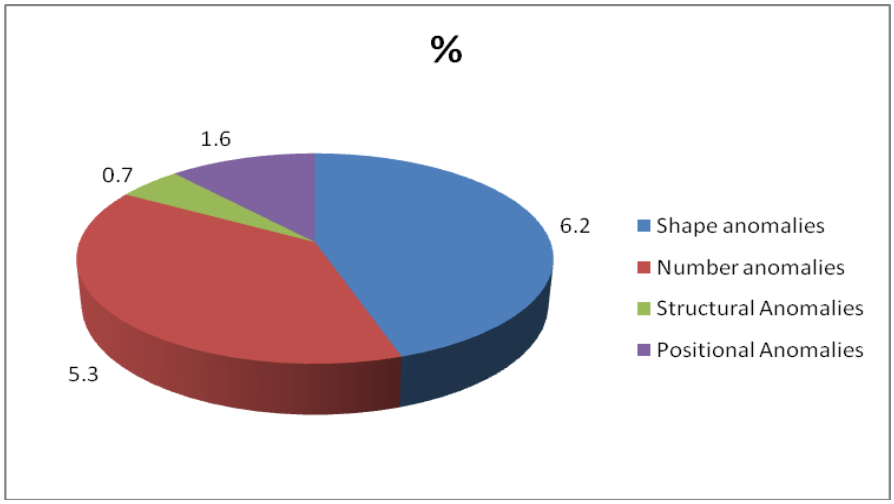
Graph3: Distribution according to Structural anomalies of teeth.



Graph4: Distribution according to positional anomalies of teeth.



Graph5: Distribution of dental anomalies



DISSCUSION

The purpose of the present study was to investigate the prevalence of dental anomalies among Hazaribag population. Mostly these anomalies develop earlier than the eruption of dentition, and are often hereditarily. The effect of the dental anomalies leads to functional, aesthetic and occlusal problems.[6]

The results of the present study supported the findings that the prevalence of Hypodontia was the most common anomaly in this study. Among the numerical anomalies congenitally missing permanent teeth were the most prevalent anomaly in children, which is similar to the findings reported by previous studies.[8,9]

However, regarding the congenitally missing permanent teeth, the types of teeth reported to be missing varied in different ethnic groups. The European and Caucasian populations mostly reported higher missing prevalence of the mandibular second premolar followed by either the maxillary or mandibular central incisors, or the maxillary second premolars.[10,11] However, the mandibular lateral incisor appears to be the most frequently missing tooth in Japanese people.[12]

In the present study, mandibular second premolar was the most frequently missing permanent teeth. Similar results were reported by previous study.[10,11]

The study showed tooth size discrepancy such as macrodontia, microdontia and peg shaped lateral incisor separately. There was no data related to

peg-shaped lateral incisors where as many studies have this finding varied between 0.3 and 8.4%.[13,14]

In the present study, supernumerary teeth were seen among 1.2% subjects and mostly in the maxillary arch and these results are more than as observed in study done Gupta et al that showed prevalence 2.40% of participants with supernumerary teeth.[15]

The least prevalent anomaly was the structural anomaly with Dentinogenesis imperfecta being the least followed by Amelogenesis imperfecta. The prevalence rate of Amelogenesis imperfecta was 0.3% while only one case of Dentinogenesis imperfecta was seen in the study, which is in line with previous results reported by Gupta SK *et al.*[15] in Indian population. However these results are in contrast to the results reported by Temilola DO *et al.* [16], in which structural anomaly was the most common form of dental anomalies with a prevalence rate of 16.1% in Nigerian population.

CONCLUSION

Thus, to conclude, the tooth number anomalies were more common followed by shape, number, positional and structural anomalies respectively in Haaribag population. Early recognition and management of dental anomalies can prevent child suffering from esthetic, orthodontic and periodontal problems.

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