

PREVALENCE OF DEVELOPMENTAL HARD TISSUE ORAL ANOMALIES AMONG 6-12 YEAR OLD SCHOOL CHILDREN OF AZAMGARH

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ABSTRACT

Purpose: To assess the prevalence of developmental hard tissue oral anomalies among school going children of Azamgarh

Materials and Methods: 513 children aged 6-12 years old studying in public and private schools were examined. A multi-stages stratified random sampling method was used. First part consisted of a predesigned and pretested questionnaire. Second part of the proforma consisted of the diagnosis of dental hard tissue anomaly was based exclusively on clinical examination using the criteria described by Schafer *et al.* Detailed examination was conducted with sterile dental mirrors and probes. The data collected was coded and tabulated and subjected to appropriate statistical analysis.

Results: The study population comprised of 513 children having 282 (54.97%) males and 231 (45.02%) females. The developmental hard tissue oral anomalies prevalence was found to be 24.7%. Positional anomalies were more prevalent than shape, structural, and number anomalies. Ectopic eruption was the most common finding (7.7%) followed by hypodontia (3.1%). Out of 513 participants, 22.6% exhibited at least one anomaly, 1.7% showed two anomalies and 0.3% subjects displayed more than two anomalies.

Conclusions: This large survey of dental hard tissues anomalies in Azamgarh children has provided anthropological and clinical data that may aid in the detection and management of dental problems among these children and perhaps elsewhere in the world.

Key words: Developmental, Hard Tissue, Oral Anomalies, School Children, Azamgarh

INTRODUCTION

Group of conditions such as developmental anomalies of teeth and oral hard tissues arise due to disturbances in development and growth that involve these tissues. These anomalies are usually

present at birth and persist throughout life and some of them develop in utero. Others may not manifest themselves for many years. Considerable number of these have genetic basis and most of these anomalies are congenital. The cause involves the interaction of genetic and environmental

factors and it appears complex and multifactorial¹.

In the dental clinic, developmental anomalies of the dentition are not frequently observed. However clinical management is usually complicated as they present with malocclusion, esthetic problem, and possible predisposition to other oral diseases but these anomalies account for a relatively low number compared to the more common oral disorders such as dental caries and periodontal diseases². These anomalies pose difficulties during dental treatment and sometimes are the cause of dental problem³.

In developing countries like India their percentage is higher, ranging between 15% and 20% whereas in industrialized countries, there are about 10% of children with developmental disturbances. For timely and accurate diagnosis of numerous genetic abnormalities of the craniofacial region, it is of great importance to identify oral/dental and minor anomalies⁴.

Though many studies have been published on the prevalence rates of several developmental oral hard tissue anomalies in different locations of the world, but similar studies on Azamgarh population are scarce; hence the present study was conducted to determine the prevalence of developmental hard tissue oral anomalies among school going children in Azamgarh city.

AIM

To assess the prevalence of developmental oral hard tissue anomalies among 6-12 year school children of Azamgarh.

Objective

- To assess the prevalence of developmental oral anomalies among study population.

- To provide recommendations/suggestions for the policy makers, school teachers, school staff and the parents of the school children for the preventive, promotive and curative measures for dental erosion.

MATERIALS AND METHODS

STUDY DESIGN

A cross sectional study was designed to evaluate prevalence of developmental hard tissue oral anomalies among 6-12 year school children of Azamgarh.

SOURCE OF DATA

Study group comprised of school going children aged 6-12 years of Azamgarh. A list of private and public schools located within the Azamgarh municipality was obtained from District School Officer (DSO).

STUDY DURATION

The study was carried out over a period of six months from January to June 2015.

PILOT STUDY

A pilot study was conducted using the proforma on 50 school children to check the validity of the questionnaire and operational feasibility of the study.

SELECTION OF THE STUDY POPULATION

Study subjects were children aged 6-12 years old and studying in public and private schools. A multi-stages stratified random sampling method was used. The schools formed the sampling frame and the school children formed the sampling units. From each selected school, the classes were selected from the school register.

INCLUSION CRITERIA

- All the school children who were present on the day of examination were included

in the study.

- Parents/guardians who gave the consent, their children were included in the study.

EXCLUSION CRITERIA

- Children those who were medically compromised
- Those with a history of diseases that could increase the risk for developing dental anomalies, such as maternal syphilis.
- Children who had fractured teeth, extensive restorations, or were wearing orthodontic appliances.

ETHICAL CLEARANCE

Permission was obtained from the institutional ethical committee of Azamgarh Dental College, Azamgarh.

APPROVAL

Approvals were taken from the principals and headmasters of the schools before the commencement of the study.

INFORMED CONSENT

A written consent was obtained from the parents of the participating school children.

METHOD OF DATA COLLECTION THE STUDY PROFORMA HAD TWO PARTS:

- ❖ **First part** consisted of a predesigned and pretested questionnaire.
- Information regarding demographic data like name, age, gender, residential address, name of school and type of school was obtained from either of consenting parent or legal guardian and where feasible was corroborated by the child.
- Second part of the proforma consisted of the diagnosis of dental hard tissue anomaly was based exclusively on clinical

examination using the criteria described by **Schafer et al⁵**.

- Detailed examination was conducted with sterile dental mirrors and probes. All the subjects were made to sit in a chair under natural light for examination (Type III).

CALIBRATION

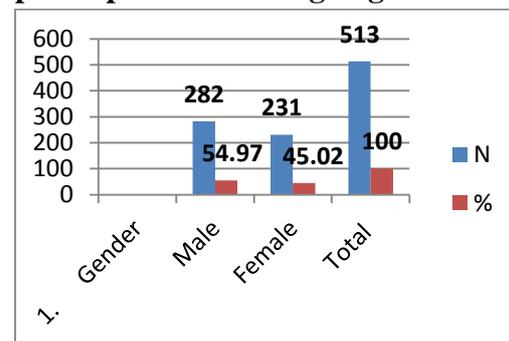
- Intra-examiner reliability was done to calibrate the principal investigator on consistency of diagnosis for dental anomalies. The intra-examiner reliability score for each of the dental anomalies studies was high.

STATISTICAL ANALYSIS

The data collected was coded and tabulated and subjected to appropriate statistical analysis. Data was analysed using SPSS software version 22. Data analysis began with tabulation of results.

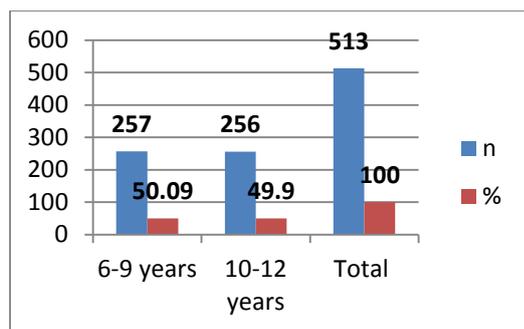
RESULTS

Graph 1: Shows distribution of study participants according to gender



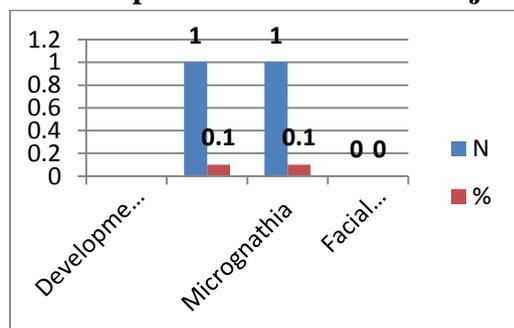
Graph 1 depicts distribution of study participants according to gender. The study population comprised of 513 children having 282 (54.97%) males and 231 (45.02%) females.

Graph 2: Shows distribution of study participants according to age



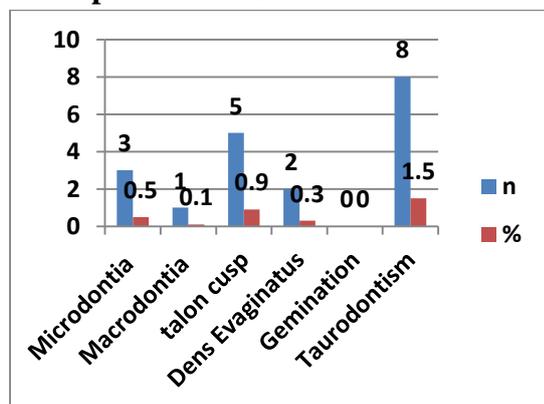
Graph 2 depicts distribution of study participants according to age. 50.09% study participants belonged to age group 6-9 years followed by 49.9% study participants who belonged to age group 10-12 years

Graph 3: shows frequency distribution of developmental disturbances of jaws



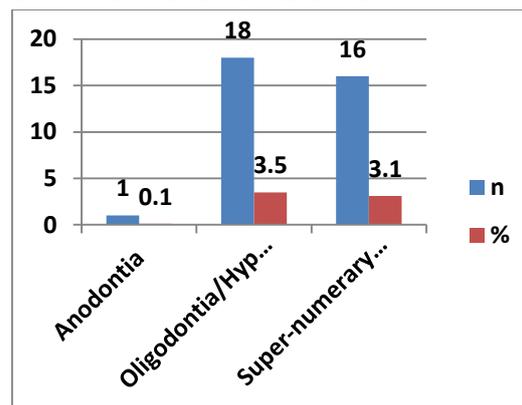
Graph 3 depicts frequency distribution of developmental disturbances of jaws. Among study participants it was observed that the prevalence of developmental disturbances of jaws was very low i.e micrognathia (1; 0.1%), macrognathia (1; 0.1%) and facial hemihypertrophy (0; 0%).

Graph 4: shows frequency distribution of shape anomalies of teeth



Graph 4 depicts frequency distribution of shape anomalies of teeth. The most common shape anomaly was taurodontism (8; 1.5%). After taurodontism, other common shape abnormalities were talons cusp (5; 0.9%), microdontia (3; 0.5%) and dens evaginatus (2; 0.3%).

Graph 5: shows frequency distribution of number anomalies of teeth



Graph 5 depicts frequency distribution of number anomalies of teeth. The most frequent tooth number anomaly was hypodontia. The total prevalence of hypodontia was 3.5%, making it the second most frequent of all developmental anomalies followed by super-numerary teeth (3.1%). Anodontia was seen in 1(0.1%) participant only.

Table 1: shows frequency distribution of positional anomalies of teeth

Positional Anomalies of tooth	n	%
Ectopic eruption	40	7.79
Rotation	9	1.7
Impaction	12	2.3

Table 1 shows frequency distribution of positional anomalies of teeth. Ectopic eruption was the most prevalent dental anomaly in the present study. It accounted for 7.7% of the anomalies. The frequency of impaction was 2.3% and rotation was

seen in 1.7% of the participants. This group of anomalies was significantly more prevalent than shape, structural and number anomalies.

Table 2: shows frequency distribution of structural anomalies of teeth

Structural anomalies of tooth	n	%
Amelogenesis Imperfecta	3	0.5
Environmental Enamel Hypoplasia	7	1.3

Table 2 shows frequency distribution of structural anomalies of teeth. Structural anomalies were rare in comparison to other anomalies. The total prevalence of Environmental enamel hypoplasia was 1.3% and Amelogenesis Imperfecta (AI) was seen in 0.5% of the participants.

Table no 3: frequencies of dental anomalies exhibited in total subjects

Variables	Total N (%)
Two anomalies	116 (22.6%)
Two anomalies	9 (1.7%)
>Two anomalies	2 (0.3%)
Total subject with dental anomalies	127 (24.7%)

Table 3 shows frequencies of dental anomalies exhibited in total subjects. Out of 513 participants, 22.6% exhibited at least one anomaly, 1.7% showed two anomalies and 0.3% subjects displayed more than two anomalies.

DISCUSSION

A cross-sectional survey was designed to assess the prevalence of developmental oral hard tissue anomalies in school going

children of Azamgarh. A total of 513 school going children aged 6-12 years of Azamgarh were selected by multistage cluster random sampling technique.

A total of 513 participants in the study were selected, which comprised of 282 males (54.9%) and 231 females (45.02%). The children of the present study belonged to 6-12 years age group. Similar age group of 5-12 years children were studied by Fnaish M *et al*⁶. This could be related to that 6-12 years gave a range of ages which were sufficiently wide to determine the prevalence of developmental dental defects on the early and late erupting teeth and the changes over time.

The overall prevalence as per the current findings regarding developmental dental anomalies was found to be 24.7%. A significant, difference between the prevalence of dental anomalies was observed in the present study as compared to those reported in previous epidemiological studies. Higher percentage was seen in a study conducted by Gupta SK *et al*⁷ in which 34.28% were present with the dental anomalies. Whereas, another study conducted by Fnaish NM *et al*⁶ (2011) in which a lower percentage (17%) of study participants had developmental oral anomalies. The probable reason for these conflicting results might be racial differences, local environmental influences, socioeconomic status and nutrition.

In the present study, among study participants it was observed that the prevalence of developmental disturbances of jaws was very low i.e micrognathia (1:0.1%), macrognathia (1; 0.1%) and facial hemihypertrophy (0). The appropriate comparison couldn't be made due to unavailability of similar studies.

In terms of frequency, shape anomalies

followed positional anomalies. The present study revealed that the prevalence of microdontia was 0.5%. A higher prevalence of microdontia (4.8%) was reported by Najm MJ *et al*¹ and Gupta SK *et al*⁷. In the present study, 0.9% of the participants showed talons cusp. Similar prevalence (0.97) was recorded in the study by Gupta SK *et al*⁷. A slightly lower prevalence of talon cusp (0.23%) was found in the study by Najm MJ *et al*¹.

Dens evaginatus was seen in prevalence of 0.3% to the total sample. These findings tend to disagree with the results (1.44%) reported by Ghabanchi J *et al*². One reason that could explain this inconsistency was the difference in the methods used for diagnosis of this anomaly. In the present study, it was observed that taurodontism was seen in 1.5%. Gupta SK *et al*⁷ found a slightly higher rate of 2.49% in an Indian population. The difference in the criteria of taurodontism might be the main reason for this inconsistency.

Study depicted that the prevalence of hypodontia was 3.5%. Higher prevalence (4.19%) was noted by Gupta SK *et al*⁷ and Shokri A *et al*⁸ (5.7%). During the study it was observed that the frequency of super-numerary teeth was 3.1%. The finding is almost similar (2.4%) to that observed by Gupta SK *et al*⁷. A higher prevalence of super-numerary teeth (4.5%) was observed in the study by Fnaish MM *et al*⁶.

Positional anomalies were more prevalent than shape, structural and number anomalies. Ectopic eruption was the most prevalent dental anomaly in the present study. It accounted for 7.7% of the participants. Gupta SK *et al*⁷ reported a equal prevalence of ectopic eruption (7.93%) in his study. This consistency might be attributed to the settings of these studies as well as the accuracy of the

methods and the diagnostic criteria that were used.

In the present study, impactions of teeth were seen in 2.3%. It was slightly lower than the figure of 4.3% reported by Ghabanchi J *et al*². The difference could be attributed to the lack of a single definition, clinical judgement, and professional opinion of observers regarding tooth impaction.

Structural anomalies were the rarest in occurrence. Many studies reported the prevalence rate of Amelogenesis imperfecta (AI), but the results varied widely. In our study, the prevalence of AI was 0.5%. Almost similar findings (0.2%) were observed in the study by Gupta SK *et al*⁷.

Out of 513 participants, 22.6% exhibited at least one anomaly, 1.7% showed two anomalies and 0.3% subjects displayed more than two anomalies. Gupta SK *et al*⁷ (2011) observed that 31.26% had atleast one anomaly, 2.49% exhibited two anomalies and 0.53% participants showed more than two anomalies. In a study conducted by Afify AR *et al*⁹ (2012), he observed that the prevalence of patient that exhibited at least one dental anomaly was 45.1% patients.

CONCLUSION

This large survey of dental hard tissues anomalies in Azamgarh children has provided anthropological and clinical data that may aid in the detection and management of dental problems among these children and perhaps elsewhere in the world. This information will enable paedodontists and public health specialists to prioritize screening measures for early diagnosis of childhood dental anomalies.

Study has shown:

1. High prevalence (24.7%) of developmental

oral anomalies among school going children in Azamgarh city.

2. Out of 513 participants, 22.6% exhibited at least one anomaly, 1.7% showed two anomalies and 0.3% subjects displayed more than two anomalies.
3. Positional anomalies were more prevalent than shape, structural, and number anomalies. Ectopic eruption was the most common finding (7.7%) followed by hypodontia (3.1%).
4. Statistical analysis indicated that developmental oral anomalies were independent of gender and age.

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