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Dental Anomalies in Permanent Dentition Among School Going Children Of Karachi

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Received date: 15th July 2024

Review date: 19th September 2024

Accepted date: 6th October 2024

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Cite this article:

Shaikh JA, Shaikh MA, Rahmat B, Ahmed W, Bhimani N. Dental anomalies in permanent dentition among school going children of Karachi. AJMAHS. 2024;2(2):29-33.

ABSTRACT

Objective: Objective of this study was to assess the prevalence of dental anomalies in permanent dentition among school going children of Karachi

Material and Methods: This cross sectional study was conducted in two schools of Karachi. Convenient sampling technique was used to recruit the students. Total sample size was 360. The students were examined in a day light by sitting on ordinary chairs. The clinical examination was done visually, aided by tongue depressor. Dental anomalies representing variations in tooth size, morphology and number like: microdontia, macrodontia, hypodontia, supernumerary teeth, double teeth, hypocalcification, and hypoplasia were recorded in the pre designed proforma. Data was analyzed by SPSS version-26.

Results: The boys were 38% and girls were 62%. The prevalence of dental anomalies was 16% among students. The types of anomalies were microdontia as 4%, Hypocalcification as (2%) macrodontia as 2%, Hypoplasia as 2%, Supernumerary teeth as 1% and mixed types as 2%. There was statistically significant (p-value-0.002) difference in the prevalence of dental anomalies between boys and girls.

Conclusion: The prevalence of dental anomalies amongst school children in Karachi was relatively high. It was observed with a higher occurrence in males showed the statistically significant difference in gender-based analyses.

Key words: dental anomalies, prevalence, school children

INTRODUCTION

Dental Abnormalities are irregularities in epithelial and mesenchymal tissues interfering normal tooth development that occur either isolated or as a syndrome, can be congenital or developmental in which tooth number, size, shape, color, texture, eruption, shedding, location and structure is impacted.¹⁻³. The most common dental malformations are morphological and

numerical occurring due to disturbances at different stages of tooth development⁴.

Approximately 7% of children born with craniofacial abnormalities which most typically include extra, missing and fused teeth along with peg lateral incisors⁵. Dental anomalies occur less common than dental caries and periodontal disease with more complicated treatment which is due to cosmetic, malocclusion and other oral concerns⁶. Dental anomalies can have negative

impact on patients' psychological well-being because they impair teeth appearance, length of maxillary and mandibular arch and occlusion.⁷⁻⁹. These concerns can have substantial impact on child's well-being and self esteem⁹.

Although the exact etiopathogenesis of dental anomalies is not fully established in the literature, genetic and environmental factors are significant contributors to their development. 10–12. Too many or too few teeth in comparison to a typical primary or permanent tooth set are known as tooth number abnormalities. The tooth is a unique component of the human body; its development is intricate and challenging to understand, and abnormalities result from disruptions throughout this process. The literature mostly examines issues that can impact dentitions, dental arches, and occlusions, such as supernumerary teeth, hypodontia, double teeth, talon cusp, macrodontia, microdontia, dens invaginatus, and taurodontism^{10,11}.

These anomalies can arise as solitary or as a specific syndrom which when spotted help in diagnosing such diseases¹³⁻¹⁴. Anomalous teeth are typically asymptomatic and are frequently detected clinically or radiographically by physicians¹⁵. Early diagnosis of developmental and eruption irregularities is critical for prompt and reliable diagnosis of numerous craniofacial genetic disorders and in providing therapy at the right time to avoid difficulties. It can be a significant tool in Forensic dentistry¹⁶.

The tooth is a specialized element of the human body, and its formation is complex and difficult to comprehend. However, early detection of developmental and eruption irregularities is critical for diagnosing problems and providing therapy at the right time to avoid difficulties. Identifying oral and dental anomalies is critical for making prompt and reliable diagnoses of numerous genetic disorders in the craniofacial region. The purpose of this study was to evaluate prevalence of dental anomalies in children of Karachi. The findings this study will provide useful information to doctors and researchers to build relevant strategic plans, conduct additional research and set up facilities for successful, preventive, curative and treatment operations in future.

MATERIALS AND METHODS

The ethical approval was obtained from ethical review committee prior to data collection. Informed consent was obtained prior to examination of each subject. This observational study was carried out from January to February 2024 in two schools namely SMB Fatima Jinnah government girls school and Federal secondary school Karachi. The Convenient sampling technique was used to recruit the students. Total sample size obtained by the Raosoft online software was 360. The inclusion and exclusion criteria were the students of either gender who were available during research procedure at school, age from 11 to 16 years and special children, students having fixed orthodontic braces, traumatic teeth and non-willing students respectively.

Data Collection procedure:

Clinical data was collected in Private and Government schools. The oral examination was conducted from children sitting on ordinary chairs. With the use of a tongue depressor, the clinical examination was conducted visually. The pre-made proforma was used to record dental anomalies that represented differences in tooth size, shape, and quantity, such as microdontia, macrodontia, hypodontia, supernumerary teeth, double teeth, hypocalcification, and hypoplasia.

Data analysis: Data was analyzed by SPSS version-26. The continuous variable like age was computed as mean and standard deviation. The categorical variables like gender, type of schools, dental anomalies, and types of anomalies were computed in frequency and percentage. The chi square test was applied between the gender and dental anomalies to check the statistically difference. The p value of ≤ 0.05 was considered as statistically significant

RESULTS AND DISCUSSION

The boys and girls were 38% and 62% respectively (Table-1). Mean age of the students were 14.12 ± 1.392 (Table-2). The students from Government and Private schools were 36% and 64% respectively (Table-3). Thee dental anomalies were observed in 16% students (Figure-1)

The types of anomalies were observed as microdontia (4.4%), Hypocalcification (2.5%) macrodontia (2.2%), Hypoplasia (2.2%) supernumerary teeth (1%) and mixed types as (2%) Fusion (0.6%) Germination (0.6%) as shown in Figure-2

The anomalies were shown in boys as 57% and

in girls as 43%. The p-value of 0.002 suggests that there is statistically significant difference in the prevalence of dental anomalies between boys and girls (Table-4)

Table 1: Descriptive Statistics of students

Students	Frequency	Percent
Boys	119	37.8
Girls	196	62.2
Total	315	100.0

Table 2: Descriptive Statistics of age

	N	Min.	Max.	Mean	Std. Deviation
Age of Students	315	12	18	14.12	1.392

Table 3: Descriptive Statistics of schools

Schools	Frequency	Percent
Government	112	35.6
Private	203	64.4
Total	315	100.0

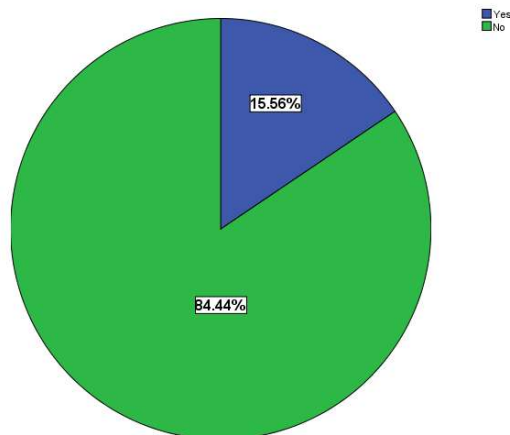


Figure 1: Prevalence of Dental Anomaly

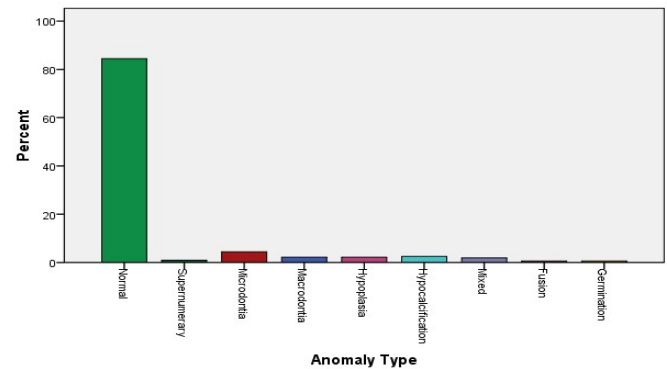


Figure 2: Types of Dental Anomalies

Table 4: Characteristics of dental anomalies with gender

Gender	Dental Anomaly		Total	P-value
	Yes	No		
Boys	28 (57.1%)	91(34.2%)	119 (37.8%)	0.002*
Girls	21 (42.9%)	175(65.8%)	196 (62.2%)	
Total	49 (100.0%)	266 (100.0%)	315 (100.0%)	

Discussion:

Dental developmental defects are typically detected during routine clinical as well as radiographical check-ups. Dental practitioners must look for quiescent anomalies or irregularities and benefit greatly from understanding the specific concerns, typical in given patient population. Early diagnosis promotes normal occlusion allowing planned permanent teeth eruption and enables dental surgeons to take a proactive approach to future cosmetic and functional concerns that may appear later in normal developmental cycle^{17,18}.

The prevalence and severity of dental abnormalities (DA) in various population groups might provide valuable information for phylogenetic and genetic investigations. This knowledge improves our understanding of differences within and across different populations^{19,20}.

In the current study the prevalence of dental anomalies was 16% which is greater than the study of Zafar M et al who observed prevalence as 7.4%, this could be due to the age and area

difference as our study is community based whereas the latter study is hospital based¹⁸. The result of this study are also not comparable with the study of Hagiwara Y conducted in Japanese high school students, this could be due to the genetic difference²¹. The study population's high prevalence of dental malformations highlights the need for epidemiological research to ascertain the prevalence and features of these conditions in paediatric patients. The goal of this study is to increase oral surgeons' comprehension of the importance of accurately diagnosing and treating such abnormalities.

The prevalence of dental anomalies among school children in our study reveals several notable patterns. Supernumerary teeth were observed in 1% of the student, which varies with the findings in Nepalese children suggesting geographical or ethnic variations in the occurrence of supernumerary teeth²². Microdontia, observed in 4.4% of our sample, aligns with findings from Kathariya MD et al who noted a similar prevalence in the students of India. This anomaly appears relatively common and can be attributed to genetic and environmental factors²³. Macrodonia was present in 2.2% of the children, which is somewhat higher compared to Kathariya MD et al who found a prevalence of 1.3% in Indian students²³. This difference may be due to variations in diagnostic criteria. The prevalence of dental fusion (0.6%) and germination (0.6%) in our study is not comparable with the studies of Kathariya MD et al²³ and Kositbowornchai et al²⁴ suggesting these anomalies occur at low but consistent rates globally.

The boy students had higher prevalence than their girl's counterparts in this study which is comparable with the results of Zafar M et al¹⁸. The findings of this study showed a significant difference between boys and girls which is similar with the study results of Gupta P et al who conducted their study of oro-dental anomalies among 14-17 years students in Panchkula District Haryana, India²⁵.

Several dental anomalies, including Dilaceration, Dentinogenesis Imperfecta, Amelogenesis Imperfecta, Talon Cusp, Anodontia, were not reported in this study. One disadvantage of this community-based assessment was the lack of radiographs, which may have resulted in an underestimating of the prevalence of dental abnormalities detectable on radiographic imaging. Nonetheless, this study provides useful

information on the occurrence of dental abnormalities among schoolchildren, highlighting both consistency and variation when compared to other investigations. These distinctions highlight the importance of genetic, environmental, and methodological aspects in dental epidemiology research. Future research with bigger sample sizes and various groups is required to better understand these trends and enhance clinical practices and public health.

CONCLUSION:

The prevalence of dental anomalies amongst school children in Karachi was considered to be relatively high with a higher occurrence in males, which is statistically significant in gender-based analyses. The anomalies observed include, microdontia followed by, hypocalcification, macrodontia, hypoplasia, supernumerary teeth, fusion, and germination. These findings highlight the necessity for heightened awareness and early detection of dental anomalies, to ensure timely and effective management.

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