Original Article

Dental Anomalies

Pattern of Developmental Dental Anomalies in Patients Visiting Sardar Begum Dental College, Peshawar

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ABSTRACT

Objective: To determine the pattern of developmental dental anomalies, compare age and to identify the most common anomaly.

Study Design: Descriptive study.

Place and Duration of Study: This study was conducted at the Sardar Begum Dental College, Ghandhara University, Peshawar during six months period in the year 2016.

Materials and Methods: This study was carried out on 350 patients with developmental dental anomalies. Preoperative data were collected through history and clinical examination. Each patient was evaluated for dental anomalies to identify the pattern, most common anomaly and compare the age distribution of anomalies. Statistical analysis included descriptive statistics and $\chi 2$ test. Results were considered significant if $P<0.05$.

Results: The age range was 8-20 years and maximum number of patients presented in 17-20 years age group (46%). The commonest anomaly was rotation (28%) followed by cusp of Carabelli (14.3%). Rotation was most common in 17-20 years age group. Cusp of Carabelli was most common in 13-16 group and in 8-12 years age group microdontia.

Conclusion: Early detection of anomalies is important to prevent complications.

Key Words: Developmental dental anomaly, Pattern, Rotation, Hyperdontia, Cusp of Carabelli, Microdontia.

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INTRODUCTION

Developmental dental anomalies are variations from the normal, size, shape structure, number and position[1]. These anomalies are caused by myriad of genetic/ hereditary/ acquired, local as well as systemic factors, influencing either the deciduous or permanent teeth before or after birth[2,3].

Globally, the frequency ranges from 1.7% to 5.5%[4,5]. It is reported that these anomalies variate in number (hyperdontia, hypodontia) predominates than variation in size and shape[3].

Few studies have been done in Pakistan to document dental anomalies in population, which shows varied results ranges from 1.4% to 7.8%.[6,7,8]

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The rationale is to identify the frequency of these anomalies in population adding more data to the literature for future comparisons. This study will also help to generate population characteristics databases which could be used for personal identification purposes like forensic odontology and will also help in the early identification of these anomalies. Once the problem is identified, it will be convenient for healthcare provider to plan comprehensive management for the condition and prevent future complications.

MATERIALS AND METHODS

Data Collection Procedure: Informed consent was taken from the patient/guardians accordingly. Patients were examined thoroughly clinically for any developmental dental anomaly/anomalies. Supplemented by detailed history and radiographic study (Periapical and OPG). The data collected were entered in a pre-formed proforma.

Data Analysis: The data were analyzed by applying descriptive statistics and chi- square test and was then calculated by using Statistical Package for Social Sciences (SPSS) version 16. For age distribution age range, mean ±SD and percentages of age groups were computed and represented in the form of graph using Microsoft Excel. Similarly, frequencies and percentages were computed for pattern of anomalies, distribution according to age groups. Tabulated and graphic analysis

of the data was performed. Data were compared calculating $\chi 2$ and p values. The level of significance was set at $p< 0.05$.

RESULTS

The age range was 8-20 years, with a mean value 14.5 ± 5.5 years. Maximum number of patients presented in 17-20 years age group (46 %) followed by 13-16 years (39%). Detail data is given in figure 1.

The most common anomaly was rotation (28%) followed by cusp of Carabelli (14.3%), while the least common was anodontia (0%) followed by gemination (0.3%). Rest of the detail is given in figure 2 and table 1.

Rotation was most common in 17-20 years age group (n=43). While cusp of Carabelli was common in 13-16 group and in 8-12 years age group microdontia was more prevalent. More detail is given in table 2.

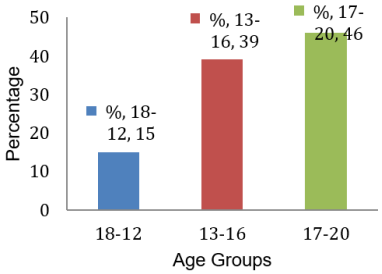

Figure No. 1: Developmental dental anomalies according to age Group

Table No. 1: Distribution of number of developmental dental anomalies and their percentages

S. No	Name of anomalies	No. of anomalies	%tage
1	Microdontia	25	(7%)
2	Macrodontia	2	(0.6%)
3	Gemination	1	(0.3%)
4	Fusion	3	(0.9%)
5	Concrescence	2	(0.6%)
6	Talon cusp	13	(3.7%)
7	Cusp of Carabelli	50	(14.3%)
8	Dens Evaginatus	9	(2.6%)
9	Dens Invaginatus	11	(3.14%)
10	Taurodontism	2	(0.6%)
11	Amelogenesis Imperfecta	14	(4%)
12	Dentinogenesis Imperfecta	5	(1.42%)
13	Anodontia	0	(0%)
14	Hypodontia	34	(9.7%)
15	Oligodontia	3	(0.9%)
16	Hyperdontia	20	(5.7%)
17	Ectopic Eruption	28	(8%)
18	Rotation	98	(28%)
19	Impaction	30	(8.5%)
Total		**350**	(100%)

Table No.2: Distribution of anomalies according to age groups

S No	Type of anomalies	Age Groups						Total
		8-12		13-16		17-20		
		M	F	M	F	M	F	
1	Microdontia	3(0.8%)	2(0.6%)	4(1.14%)	5(1.42%)	4(1.14%)	7(2%)	25(7%)
2	Macrodontia	0(0%)	0(0%)	0(0%)	0(0%)	1(0.3%)	1(0.3%)	2(0.6%)
3	Gemination	0(0%)	0(0%)	0(0%)	1(0.3%)	0(0%)	0(0%)	1(0.3%)
4	Fusion	0(0%)	0(0%)	1(0.3%)	1(0.3%)	0(0%)	1(0.3%)	3(0.9%)
5	Concrescence	0(0%)	0(0%)	0(0%)	0(0%)	1(0.3%)	1(0.3%)	2(0.6%)
6	Talon cusp	1(0.3%)	1(0.3%)	2(0.6%)	3(0.9%)	3(0.9%)	3(0.9%)	13(3.7%)
7	Cusp of Carabelli	3(0.9%)	4(1.14%)	9(2.6%)	11(3.14%)	10(2.9%)	13(3.7%)	50(14.3%)
8	Dens Evaginatus	0(0%)	1(0.3%)	3(0.9%)	2(0.6%)	1(0.3%)	2(0.6%)	9(2.6%)
9	Dens Invaginatus	0(0%)	0(0%)	2(0.6%)	3(0.9%)	3(0.9%)	3(0.9%)	11(3.14%)
10	Taurodontism	0(0%)	0(0%)	0(0%)	0(0%)	1(0.3%)	1(0.3%)	2(0.6%)
11	Amelogenesis Imperfecta	1(0.3%)	2(0.6%)	2(0.6%)	3(0.9%)	3(0.9%)	3(0.9%)	14(4%)
12	Dentinogenesis Imperfecta	0(0%)	1(0.3%)	1(0.3%)	1(0.3%)	1(0.3%)	1(0.3%)	5(1.42%)
13	Anodontia	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)	0(0%)
14	Hypodontia	3(0.9%)	3(0.9%)	6(1.7%)	7(2%)	6(1.7%)	9(2.6%)	34(9.7%)
15	Oligodontia	0(0%)	0(0%)	0(0%)	1(0.3%)	1(0.3%)	1(0.3%)	3(0.9%)
16	Hyperdontia	1(0.3%)	2(0.6%)	4(1.14%)	4(1.14%)	4(1.14%)	5(1.42%)	20(5.7%)
17	Ectopic Eruption	2(0.6%)	3(0.9%)	5(1.42%)	6(1.7%)	5(1.42%)	7(2%)	28(8%)
18	Rotation	7(2%)	9(2.6%)	16(4.6%)	23(6.5%)	20(5.7%)	23(6.5%)	98(28%)
19	Impaction	2(0.6%)	3(0.9%)	5(1.42%)	6(1.7%)	6(1.7%)	8(2.3%)	30(8.5%)
Total		23(6.5%)	31(8.8%)	60(17.%)	77(22%)	70(20%)	89(25%)	350(100%)

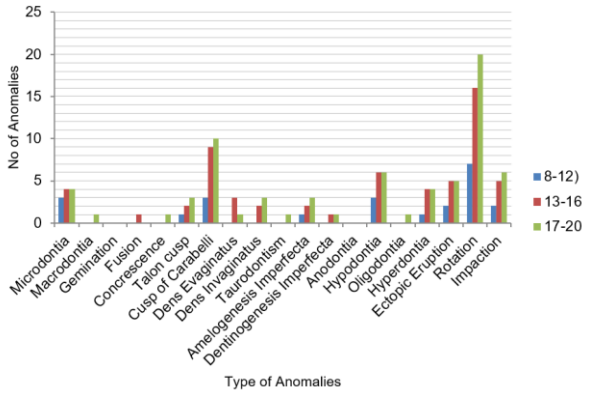

Figure No. 2: Distribution of type and number of anomalies according to age group

DISCUSION

During routine clinical examination of oral cavity these developmental dental anomalies are noted in clinical practice. A plethora of epidemiological studies, which have been conducted across the globe. Unfortunately, few studies have been conducted in Pakistan about the pattern and prevalence of dental anomalies.

Microdontia: The prevalence ranges from 0.8% to 8.4% in various populations. In this study microdontia was noted in 8.2% of total patients, while Backman et al[9] had recorded lower percentages in their study.

Macrodontia: Only two patients presented with macrodontia. Macrodontia is much less common than microdontia.[10,11,12,13]

Macrodontia is noted 0.6% in the present study. Similarly, Patil S[14] gave 0.2% in his study.

Gemination: Gemination is defined an incomplete division of one tooth germ. It has prevalence of 0.1% in permanent dentition.[15] 0.3% of total cases was found in the present study. Similar findings had been given by Guttal KS[3](0.28%) and Altug-Atac AT et al[16](0.07%).

Fusion: In the present study 0.6% fusion cases was found. The tooth may be of normal size or larger than normal. The prevalence ranges from 0.02% to 5% based on geographic, racial or genetic factors.[17,18,19,20] Nearly similar results were given regarding the fusion 0.7% by Kositbowornchai S[21], 0.23% by Altug-Atac AT et al.[16]

Concresence: In the present study, only two patients had concrescence constituting 0.6% of all of the dental anomalies. Guttal KS[3] had reported 1.4%.

Talon Cusp: During the present study 3.7% talon cusp occurred. Guttal KS[3] had reported 4.28%. Overall talon cusp ranges from less than 8% in different populations.[3,21,22,23]

Cusp of Carabelli: The cusp of Carabelli reported in this study is 14.3%. It was seen in 2.17% by Najm MJ et al[24] and by Falomo O in Nigeria which was 17.43%.

Dens Evaginatus: In the present study, dens evaginatus comprised 2.6% of the total dental anomalies. Guttal KS et al[3] had reported 2.85%. These results are in accordance with results of the current study. In two successive surveys of over 1,000 Chinese subjects 1.3% and 1.5%, were affected by dens evaginatus.[25,26] A slightly higher prevalence figure of 4.3% was reported in several Indian studies.[3,22,27,28]

Dens Invaginatus: In the present study the percentages of dens invaginatus was 3.12%. The incidence among several population groups ranged from 0.25 to 5.1%.[29,30]

Taurodontism: Taurodontism is 0.6% in this study Its prevalence has been reported to range between 1.67% and 16%. In study of Guttal KS[3], it accounted for 18% and Gupta SK et al[22] reported 2.49%.

Amelogenesis Imperfecta (AI): It is 3.9% in present study and its prevalence varies from 0.7% to 4% according to the populations studied. The sample of Sener S et al[23] included two cases (0.2%), which is comparatively lower than the present study. Najm MJ et al[24] reported 2.04% and 7.72% in the study of Ezoddini AF et al.[10]

Dentinogenesis Imperfecta: In this study, DI was found to be 1.4%. 1 case was reported only (0.09%), making it the rarest anomaly.[22]

Anodontia: No case of anodontia was noted in the present stud**y.**

Hypodontia: Current study showed 9.7%. The recorded prevalence rates of different studies ranges from 0.1% to 11.2%. Tofangchiha M[31] and coworkers reported a prevalence rate of 9.7%. Figures about hypodontia are in line with the results obtained from studies in Japan[31] 9.40% and Saudi Arabia[33] 9.41%, while several other studies showed in little bit lower prevalence rates of 6.5%, 7.9%, 7.25%. 6.9%, 7.68% respectively.[21,23,34,35]

Oligodontia: This study showed 0.9% oligodontia. It is relatively rare condition with the prevalence reported to vary from 0.08% to 8%. Altug-Atac AT et al[16] had found 0.13%, Backman 1.9%, while Thongudomporn U et al[37] a higher percentage (8.1%) in their studies.

Hyperdontia (Supernumerary Teeth): This study recorded 5.5% hyperdontia. The prevalence ranges from 0.3% to 6.5% in various populations.[33,34,35] In Caucasians they range from 0.4% to 2.1%; while they are 3.4% for Japanese and 6% for American Blacks.[4]

Ectopic Eruption: This study recorded 7.95%, which is similar to Gupta SK[4] study. A very high percentage had been recorded in Pakistan by Abbas Q et al[36] with 21.3% of ectopic eruption. This difference is due to the selected orthodontic patients.

Rotation: 28% rotation is noted in this study. Gupta SK[4] showed that rotations occurred 10.24%. In the present study high prevalence of rotation is due to the fact that 45° and 90° rotations were included.

Impaction: 8.5% impactions were present in this study. Ezoddini et al[10] and Thongudomporn and Freer also found a somewhat similar prevalence of respectively 8.3% and 9.9% in non-orthodontic patients.[37]

CONCLUSION

The age range was 8-20 years and maximum number of patients presented in 17-20 years.

The most common anomaly was rotation followed by cusp of Carabelli, while the least common was anodontia. Rotation was most common in 17-20 years age group, while cusp of Carabelli was most common in 13-16 and microdontia in 8-12 years.

Various anomalies are noted. The presence of such anomalies suggests a complete evaluation of the patient to rule out any syndrome and initiate treatment earlier.

Recommendations: Young patients are psychologically more conscious about their esthetics and these anomalies may disturb their psychosocial behavior:

1. To reduce the complications in affected patients, it is recommended that dental and radiographic examination must be carried out routinely.
2. More studies are required in rural and urban hospital from all districts of Khyber Pakhtunkhwa to assess and adopt earlier management.
3. Public dental health services may be initiated in the province.

Author's Contribution:

Concept & Design of Study:	Sana Naeem
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Data Analysis:	Tehmina Marwat, Muhammad Sheraz Alam, Amin Jan
Revisiting Critically:	Sana Naeem, Farzana Kalsoom
Final Approval of version:	Sana Naeem

Conflict of Interest: The study has no conflict of interest to declare by any author.

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