RESEARCH ARTICLE

PREVALENCE AND DISTRIBUTION OF SELECTED DEVELOPMENTAL DENTAL ANOMALIES AMONG PATIENTS VISITING DENTAL COLLEGE AZAMGARH

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ABSTRACT

Background: The aim of this study was to determine the prevalence and distribution of selected developmental dental anomalies in size, shape, number, structure and position of teeth among patients visiting Oral medicine and radiology Department of Dental College Azamgarh.

Materials and methods: The study sample comprised of 94,507 subjects in age range of 14 to 79 years randomly screened who visited the outpatient Department of Oral Medicine and Radiology of Dental college Azamgarh, after obtaining their informed consent. The following dental anomalies were assessed:-a) Disturbance in size (Microdontia, Macrodontia) b) Disturbance in shape (Talon cusps, Dens evaginatus, Fusion, Peg-shaped lateral incisors).C) Disturbance in number (Hyperdontia, Hypodontia).d) Disturbances in structure (Amelogenesis imperfecta, Dentinogenesis imperfecta). E) Disturbance in position (Transposition, Transmigration).

Results: A total of 1, 21,899 subjects (60,033 males and 61,866 females) were examined. After exclusion criteria a total of 94,507 subjects were included (46,337 males and 48170 females). A total of 5508 individuals (5.8 %) had developmental dental anomalies. The distribution of sex was 3151 males (57.2%) and 2357 females (42.79%). The total prevalence of dental anomalies was 5.83% with a male prevalence of 6.80% and female prevalence of 4.89%.

Keywords: Microdontia, Shape anomalies, Talon cusp.

INTRODUCTION:

There are little available epidemiological data on the anomalies associated with the dentition in Indian population. Studies are undertaken on individual anomalies related to teeth and that too on a smaller sample size. In most studies the sample size is too small to reach valid conclusions regarding the distribution of dental anomalies. The dental anomalies, developmental or congenital could be related to some hereditary conditions, syndromes or may be environmental.Evidence has been accumulating, that biologically links some dental abnormalities occurring together more frequently than would be expected by chance alone. These related abnormalities include variation in tooth number, size, shape, structure, eruption chronology and sequencing[1] .It is important to treat these

anomalies because they can create disturbances in maxillary and mandibular dental arches and occlusion. There are little available epidemiological data on the anomalies associated with the dentition in Indian population. Studies are undertaken on individual anomalies related to teeth and that too on a smaller sample size. In most studies the sample size is too small to reach valid conclusions regarding the distribution of dental anomalies. The dental anomalies, developmental or congenital could be related to some hereditary conditions, syndromes or may be environmental. This longitudinal epidemiological survey study is an attempt to evaluate and increase the insight in the prevalence of dental anomalies[2]. This study can be a new contribution to the literature.

MATERIALS AND METHODS:

The study sample comprised of 94,507 subjects in age range of 14 to 79 years randomly screened who visited the outpatient Department of Oral Medicine and Radiology of Dental college Azamgarh, after obtaining their informed consent. Inclusion Criteria's a) Clinically evident anomalies were only included b) Subjects with developmental anomalies in size, shape, number, structure, and position.c) Syndromic patients with multiple dental anomalies was included. .Exclusion Criteria's a) Teeth missing due

to caries, periodontal conditions, and traumatic injuries b) History of extraction or orthodontic treatment.c) Patients having cleft lip and palate.

The present study will evaluate 94,507 subjects. The study will be undertaken with the aid of clinical examination and intraoral photographs. The following dental anomalies were assessed:-a) Disturbance in size (Microdontia, Macrodontia) b) Disturbance in shape (Talon cusps, Dens evaginatus, Fusion, Peg-shaped lateral incisors).C) Disturbance in number (Hyperdontia, Hypodontia).d) Disturbances in structure (Amelogenesis imperfecta, Dentinogenesis imperfecta). E) Disturbance in position (Transposition, Transmigration).

Statistical analysis: All the details of the patient were entered into the proforma sheet which included patient details as well as the type of anomalies. Proforma was filled for the patient with at least one developmental dental anomaly. Data collected were entered into a spreadsheet (Excel 2007; Microsoft Office, Microsoft Corporation, USA) and analyzed subsequently using the Statistical Package for Social Sciences (Windows version 17.0; SPSS Inc., Chicago, IL, USA). The prevalence rates of different developmental dental anomalies were assessed. Distribution of developmental dental anomalies in a study

group among male and Female were analyzed using Pearson's Chi square test. In the present study, the level of significance (α) was fixed at 5%. (p≤ 0.05).

RESULTS:

Out of 94,507 subjects 46,337 were males and 48170 were females). A total of 5508 individuals (5.8 %) had developmental dental anomalies. The distribution of sex was 3151 males (57.2%) and 2357 females (42.79%). Data obtained was analyzed using Statistical package for Social Sciences (SPSS) software version 17.0.

Table 1 show the distribution and prevalence of developmental dental anomalies in a study group of 94,507 individuals (46,337 males and 48,170 females) with p values from Chi square test. Out of the total 94,507 individuals, 4303 subjects exhibited at least one anomaly, 1205 subjects showed two anomalies and no subjects displayed more than two anomalies.

Out of the total 94,507 individuals, 4303 subjects exhibited at least one anomaly, 1205 subjects showed two anomalies and no subjects displayed more than two anomalies. Table 2 show the frequencies of dental anomalies exhibited in the total subjects. On intergroup comparison of the five study groups of dental anomalies selected, the prevalence of size anomalies was significantly higher than the prevalence rates of shape, structural, number and positional anomalies. Table 3 shows the comparative analysis between different study groups of anomalies. Microdontia was the most common (2.47%) anomaly among the whole study group followed by hyperdontia (1.75%) and peg shaped laterals (1.01%), while dentinogenesis imperfecta (0.01%) was the rarest anomaly, followed by amelogenesis imperfecta (0.02%) and macrodontia (0.04%) among patients.

TABLE 1: Distribution and prevalence of developmental dental anomalies in a study group of 94, 507 individuals (46,337 males and 48,170 females) with p values from chi square test.

Dental Anomalies	Female (n=48170)	Male (n=46337)	Total (n=94507)	Female (n%)	Male (n%)	Total (n%)	Level of significance p value
Unilateral Microdontia	744	996	1740	1.50	2.10	1.80	0.000
Bilateral Microdontia	273	324	597	0.60	0.70	0.60	0.010
Unilateral Talon Cusps	8	15	23	0.00	0.00	0.00	0.120
Bilateral Talon Cusps	32	50	82	0.10	0.10	0.10	0.031
Unilateral Dens Evaginatus	5	6	11	0.00	0.00	0.00	0.714
Unilateral Fusion	48	80	128	0.10	0.20	0.10	0.908
Bilateral Fusion	2	3	5	0.00	0.00	0.00	0.624
Unilateral Peg Laterals	83	102	185	0.20	0.20	0.20	0.096
Bilateral Peg Laterals	321	453	774	0.70	1.00	0.80	0.000

Hypodontia Maxillary Central Incisor	4	6	10	0.00	0.00	0.00	0.488
Hypodontia Maxillary Lateral Incisor	11	14	25	0.00	0.00	0.00	0.486
Hypodontia Mandibular Central Incisor	3	8	11	0.00	0.00	0.00	0.116
Hypodontia Maxillary Premolar	5	6	11	0.00	0.00	0.00	0.714
Hypodontia Mandibular Premolar	3	4	7	0.00	0.00	0.00	0.668
Hypodontia Maxillary Molar	3	2	5	0.00	0.00	0.00	0.686
Hypodontia Mandibular Molar	1	0	1	0.00	0.00	0.00	0.327
Hyperdontia Maxillary Unilateral	281	421	702	0.60	0.90	0.70	0.001
Hyperdontia Maxillary Bilateral	75	82	157	0.20	0.20	0.20	0.422
Hyperdontia Mandibular Unilateral	263	384	647	0.50	0.80	0.70	0.001
Hyperdontia Mandibular bilateral	73	77	150	0.20	0.20	0.20	0.572
Amelogenesis Imperfecta	10	9	19	0.00	0.00	0.00	0.885
Dentinogenesis	10	7	17	0.00	0.00	0.00	0.517

TABLE 2: Frequencies of dental anomalies exhibited in the total subjects.

Variables	Total (94,507) n (%)
At least one anomaly	4303 (4.55%)
Two anomalies	1205 (1.27%)
> Two anomalies	0 (0%)
Total subjects with dental anomalies	5508 (5.83%)

TABLE 3: Comparitive analysis between different study groups of anomalies in a study group of 94,507 individuals (46,337 males and 48,170 females).

Dental Anomalies	Total	Total Prevalence %	Male	Male Prevalence %	Female	Female Prevalence %
Shape Anomalies	1266	1.33	737	1.59	529	1.09
Talons Cusp	105	0.11	65	0.14	40	0.08
Dens Evaginatus	69	0.07	34	0.07	35	0.07
Fusion	133	0.14	83	0.17	50	0.10

Peg Shaped Laterals	959	1.01	555	1.19	404	0.83
Size Anomalies	2378	2.51	1345	2.90	1035	2.14
Microdontia	2337	2.47	1320	2.84	1017	2.11
Macrodontia	41	0.04	23	0.05	18	0.03
Structural Anomalies	36	0.03	16	0.03	20	0.04
Amelogenesis Imperfecta	19	0.02	9	0.01	10	0.02
Dentinogenesis Imperfecta	17	0.01	7	0.01	10	0.02
Number Anomalies	1726	1.82	1004	2.16	722	1.49
Hypodontia	70	0.07	40	0.08	30	0.06
Hyperdontia	1656	1.75	964	2.08	692	1.43
Positional anomalies	102	0.10	51	0.11	51	0.10
Transposition	73	0.07	38	0.08	35	0.07
Transmigration	29	0.03	13	0.02	16	0.03
Total	5508	5.83	3151	6.80	2357	4.89

DISCUSSION:

Although so many researchers have studied the prevalence of dental anomalies, only limited studies have statistically analyzed the prevalence and distribution of various developmental dental anomalies in Indian population. There was a significant difference between the prevalence of dental anomalies observed in previous epidemiological studies and the present study. A significant difference and correlations were also observed in the prevalence of similar anomalies between the present study and the study by Guttal et al[3] and Saurabh K. Gupta et al[4]. In my study size anomalies constituted the most dominant group in occurrence. Microdontia and macrodontia were included in the group of size anomalies. Out of the 5508 subjects with dental anomalies, 2378 exhibited size anomalies with an overall prevalence of 2.51%. Microdontia were the most prevalent in the whole group study. In a study conducted by Tsai et al. [5] in the Southern Chinese population the second most prevalent dental anomaly was

microdontia and it constituted around 6.9% of the total population. Similar study which was conducted by Thongudomporn et al.[6] among orthodontic patients and found that microdontia is the most prevalent dental anomaly and accounts for about 9.9% among all other developmental dental anomalies. The third most dominant group in study was shape anomalies and exhibited a prevalence rate of 1.33% among the whole subjects included in the study. Four anomalies were considered in shape anomalies group which includes talon cusps, dens evaginatus, fusion and peg-shaped lateral incisors. Among all these peg-shaped lateral incisors were the most prevalent among shape anomalies. All other authors included peg-shaped lateral incisors in the group of microdontia whereas in a study by Gupta et al[3,] .Among Indian population included peg-shaped lateral alone as microdontia with a prevalence rate of 2.58% of the total subjects and that was the most prevalent developmental dental anomaly in that study group. In my study the second most dominant group in occurrence were number anomalies with an overall prevalence rate of 1.82%. Hyperdontia and hypodontia were included in the group of number anomalies. Out of 5508 subjects 1726 shows either hypodontia or hyperdontia. Hyperdontia were the most prevalent among number anomalies. Zhu et al [7] conducted a study in

Turkish population and found that the prevalence of hyperdontia was 1% to 3% which was most prevalent among them. None of the other studies shows a high prevalence rate in hyperdontia except the two other similar studies conducted in Indian population by Guttal et al. [3] and Gupta et al[4.] Structural anomalies were the rarest in occurrence with an overall prevalence rate of 0.03%. Amelogenesis imperfecta and dentinogenesis imperfecta were included in this group. According to the studies conduted by various authors such as Thongudomporn [6] Uslu [8], Ghaznawi (1999), [9] Ezoddini [10]Backman [11]and also the Indian author Guttal et al [3.]Positional anomalies comprise the second rarest group of anomalies after structural anomalies with an overall prevalence rate of 0.10%. In my study transposition and transmigration were included in the group of positional anomalies. None of the other studies in the literature included transposition and transmigration in position anomalies. In our study the overall prevalence of transposition was 0.07% with a male prevalence of 0.08% and female prevalence of 0.07%

CONCLUSION:

A total of 1, 21,899 subjects (60,033 males and 61,866 females) were examined. After exclusion criteria a total of 94,507 subjects were included (46,337 males and 48170

females). A total of 5508 individuals (5.8 %) had developmental dental anomalies. The distribution of sex was 3151 males (57.2%) and 2357 females (42.79%). The total prevalence of dental anomalies was 5.83% with a male prevalence of 6.80% and female prevalence of 4.89%. So according

to my study the prevalence of dental anomalies are more in males than in females among patients. The disparity in prevalence compared with previous studies might arise from racial differences or differences in diagnostic criteria used by various authors.

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