

Prevalence of dental anomalies in south Indian population attending orthodontic treatment

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Abstract

Aims and Objectives: To evaluate the prevalence and distribution of dental anomalies among orthodontic patients from a part of Andhra Pradesh population and apply it to the whole population.

Methodology: Pretreatment records including the study models and panoramic radiographs of 600 orthodontic patients attending for the treatment between 2017-18 were evaluated for the dental anomalies (developmental) and statistical analysis using Statistical Package for Social Sciences (SPSS) version 16.0 was carried out. Chi-square test and fisher exact test was used to compare the data.

Results: out of 600 patients, 22.3% showed dental anomalies, from which 19.6% exhibited one dental anomaly and 2.6% showed more than one: missing third molars being most common(16%), followed by dilacerations of roots (3%), agenesis(3%), peg laterals(1.6%), supernumerary teeth (.66%), dens evaginatus (.66%), dens invaginatus (0%), Macrodonia(0%).

Conclusions: 22.3% of the patients showed at least one dental anomaly. Most common anomaly in the present study is missing 3rd molars. In the maxilla prevalence of anomaly was greater for lateral incisor for agenesis and peg shape, whereas it is for 2nd premolars in the mandible.

Keywords: Dental anomalies, Malocclusion, Orthodontics.

Introduction

Dental anomalies refer to the anomalies of tooth number, shape, size and position of the teeth in both the arches. These anomalies have a profound effect on the arch length and occlusion resulting in the malocclusion. Hence accurate diagnosis is important in planning the treatment in Orthodontics as the presence of anomalies may complicate the treatment planning. Several studies have been published till date investigating the prevalence of various dental anomalies but only few were carried on orthodontic patients & most of them have excluded missing third molars, whose presence or absence is very important in orthodontic treatment planning. Lind¹ et al study on 1717 Swedish orthodontic patients concluded that 3.6 per cent had supernumerary teeth. A survey on the incidence of missing teeth by Rose² et al on 6000 orthodontic patients aged 7 to 14 years unveiled 4.3 per cent had at least one congenitally missing tooth. A twin study by Kotsomitset al.³ on 202 orthodontic patients (101 pairs) reported a prevalence of 29.7 per cent for ectopic eruption and 8.4 per cent for agenesis. Thongudomporn and Freer⁴ in their study on 111 orthodontic patients found that 74.8% had at least 1 dental anomaly, with invagination being the most common. Endo Tet al⁵ evaluated 8.5% prevalence of hypodontia on 3358 Japanese orthodontic patients aged 5 to 15.

From these studies it was reported that orthodontic patients have high prevalence rates of dental anomalies, which are often not being considered during treatment planning. Therefore, it is important to carefully

investigate these anomalies at the time of diagnosis and treatment planning. The present study was aimed to find the prevalence of dental anomalies in a part of Andhra Pradesh population from the existing pre-treatment records of dental colleges in Vishakapatnam.

Methodology

Pre treatment records including study models and orthopantomograms of 600 orthodontic patients with an age range of 12-30 who were undergoing orthodontic treatment during 2017-18 were collected randomly from two different dental colleges and 2 private clinics in Vishakapatnam and were evaluated for the presence of anomalies. Detailed case history for all the patients was obtained and the inclusion criteria included subjects with no significant medical history, such as trauma, metabolic disorders or syndromes affecting bone metabolism and/or tooth formation, cleft lip and palate, craniofacial anomalies and no history of previous orthodontic treatment.

All the pretreatment records were analysed for the following dental anomalies which include hypodontia and supernumerary teeth (anomalies of number), Micro or Macrodonia (anomaly of size), Peg laterals or Invagination or evagination (anomaly of shape) and dilacerations (anomaly of root). Data collected were pooled and analyzed for frequency and sex distribution using the SPSS software version 16.0.

Chi Square Test and Fisher test was used to find the differences in prevalence rates of each dental anomaly among different sexes and the related P values

were calculated. The confidence level of the study was kept at 95%, hence a "p" value less than 0.05 is indicated as a statistically significant difference.

Results

Of the total 600 patients attending the orthodontic treatment during the year 2017-18, pre treatment records unveiled 134 patients (22.3%) with the dental

anomalies. Out of the 22.3% patients exhibiting dental anomalies, 19.6% have at least one anomaly where as 2.7% of patients exhibited more than one dental anomaly. The frequencies of selected anomalies, sex distribution and statistical differences between sexes, are shown in Table 1.

Table 1: Distribution of dental anomalies among gender

Developmental Anomalies	Male (30)		Female (104)		Total (134)		P- Value
	N	%	N	%	N	%	
Agenesis	2	6.7	16	15.3	18	13.4	0.04
Supernumerary tooth	2	6.7	2	1.9	4	2.9	1
Evagination	0	0	4	3.8	4	2.9	0.85
Dens Invaginatus	0	0	0	0	0	0	
Peg Laterals	2	6.7	8	7.6	10	7.4	0.75
Microdontia	0	0	6	5.7	3	4.4	0.64
Macrodontia	0	0	0	0	0	0	
Dilaceration	4	13.3	14	13.4	18	13.4	0.55
Missing 8's	20	66.6	76	73	96	71.6	0.02

Chi square Test with significant P-value <0.05

Comparing the sexes for the dental anomalies females exhibited greater presence of anomalies compared to that of the males. But there was no statistically significant correlation between the dental anomalies and the sex of the patient, except for theagenesis andmissing 3rd molars with a p value of 0.04 and 0.02 respectively. This significant co relation was higher in females than males.

In the present study of all the anomalies examined missing 3rd molars was more common among the orthodontic patients. Of the total patients exhibiting the anomalies, 16% i.e., 96 patients presented with missing 3rd molars, whereas agenesis and dilacerations were accounted for 3% individually, peg laterals in 1.6% of patients and the remaining anomalies represent <1% each.

Maxillary laterals were the most commonly missing teeth followed by maxillary second premolars ad mandibular second premolars. Dilaceration was mostly observed in the mandibular second premolars. In the present study microdontia and Dens evaginatus was least observed whereas macrodontia is absent.

Discussion

In the present study, the prevalence of permanent tooth anomalies in patients who underwent orthodontic treatment was analysed providing an estimation of the prevalence of dental anomalies in orthodontic patients of Andhra Pradesh as a whole.

In the present study among all the anomalies examined missing 3rd molars was the most common which accounted for 16% of the total population which is more than that reported by Sandhu et al.⁶(11.5%) and

Hattabet al⁷ (9.1%) in their respective studies. The frequency of missing 3rd molars was 1.5 times greater in the maxilla than that of the mandible and there was no significant difference with respect to side. This is in accordance with the previous studies in the literature which say that missing third molars is the most common dental anomaly in the general population.⁸

In the present study dilaceration of roots and the agenesis (excluding 3rd molars) were the second most common dental anomalies with a prevalence rate of 3% each. It was most common in the lower teeth than the upper teeth and the right side teeth were more commonly affected. Whereas in a study by Vibhute, et al.⁹ in western Maharashtra population observed in 4.1% of the patients with dilaceration. The reason may be the usage of Panoramic radiography alone in the present study for diagnosing the root dilaceration as it cannot conclude the direction of dilacerations whether it is labial or lingual in direction. This require additional radiographs at different angles to correctly conclude this anomaly. With respect to agenesis maxillary lateral incisors were the most commonly missing teeth after third molars. This is in accordance with the previous studies by Usluet al,¹⁰ Altug-Atacet al¹¹ who concluded that maxillary teeth were most commonly missing teeth compared to that of the mandibular teeth. In the lower arch mandibular premolars were the most common missing teeth in the present study followed by the mandibular central incisors.

From the previous research by Brin et al¹² and Ooshima et al,¹³ frequency of peg-shaped lateral incisors varied between 0.3 and 8.4% respectively and in the present study the frequency was about 1.6% but this frequency is significantly lower than that of the

Udom et al¹⁴ study where the frequency was found to be 9.9%. in the present study peg laterals were more commonly seen on the right side with respect to proportion of teeth that were affected. This difference with the previous studies may be attributed to the ethnicity and the difference in the sample size.

From the radiographs of 1751 Iranian patients Vahid-Dastjerdi et al¹⁵ reported a 0.74% frequency of supernumerary teeth which in concurrence with the frequency of 0.66% in the present study, whereas Udom et al¹⁴ reported a prevalence of 1.8% for supernumerary teeth. Supernumerary teeth may cause delayed or ectopic eruption of the permanent teeth which further change the occlusion and appearance (Kositbowornchai et al.¹⁶, 2010).

Previous studies^{10,17,18} have reported a prevalence of 0.05% and 6.4% for Dens evaginatus in various ethnic population whereas in the present study it was found to be .66%. Microdontia was seen in 1% of the sample & was present in generalised form. Darwazeh¹⁹ in his study reported 8% prevalence of macrodontia whereas it was not seen in any of the patients in the present study. A study by MacDonald-Jankowski and Li²⁰ in adult Chinese population reported a higher frequency (46.4%) of taurodontism which may be attributed to the differences in diagnostic criteria and racial variations.

Highest prevalence of Dens invaginatus was found in 26.1% of Australian patients in Udom et al¹⁴ study. The prevalence was much higher than 1.7 per cent reported by Ruprecht et al.²¹ (1986) whereas in our sample, none of the cases of Invaginatus was seen.

Conclusions

In the present study it was found that 22.3% of the patients showed at least one dental anomaly. Most common anomaly in the present study is missing 3rd molars. In the maxilla prevalence of anomaly was greater for lateral incisor for agenesis and peg shape, whereas it is for 2nd premolars in the mandible. No significant association between the occurrence of dental anomalies and sex distribution was found.

References

- Lind V. Medfoddaantals variationer i permanenta dentitionen. *Odont Rev* 1959;10:176-89.
- Rose JS. A survey of congenitally missing teeth, excluding third molars, in 6000 orthodontic patients. *Dent Pract (Bristol)* 1996;17:107-14.
- Kotsomitis N, Dunne MP, Freer TJ. A genetic aetiology for some common dental anomalies: A pilot twin study. *Aust Orthod J* 1996;14:172-8.
- Thongudomporn U, Freer TJ. Prevalence of dental anomalies in orthodontic patients. *Aust Dent J* 1998;43(6):395-8.
- Endo T, Ozoe R, Kubota M, Akiyama M, Shimooka S. A survey of hypodontia in Japanese orthodontic patients. *Am J Orthod Dentofacial Orthop* 2006;129:29-35.
- Sandhu S, Kaur T. Radiographic evaluation of the status of third molars in the Asian-Indian students. *J Oral Maxillofac Surg* 2005;63:640-5.
- Hattab FN, Fahmy MS, Rawashedeh MA. Impaction status of third molars in Jordanian students. *Oral Surg Oral Med Oral Pathol* 1995;79:24-9.
- Bansal, et al.: Frequency of impacted and missing third molars among orthodontic patients in the population of Punjab. *Indian Journal of Oral Sciences* 2012;3:24-27.
- Vibhute, et al.: Prevalence of Dental Anomalies in Western Maharashtra, India. *Journal of Orthodontic Research* 2013; 1:66-69
- Uslu O, Akcam O, Evirgen S, Cebeci L. Prevalence of dental anomalies in various malocclusions. *Am J Orthod Dentofacial Orthop* 2009;135(3):328-5.
- Altug-Atac AT, Erdem D (2007). Prevalence and distribution of dental anomalies in orthodontic patients. *Am. J. Orthod. Dentofacial. Orthop.*, 131:510-514.
- Brin I, Becker A, Shalhav M (1986). Position of the maxillary permanent canine in relation to anomalous or missing lateral incisors: a population study. *Eur. J. Orthod.*, 8:12-16.
- Ooshima T, Ishida R, Mishima K, Sobue S (1996). The prevalence of developmental anomalies of teeth and their association with tooth size in the primary and permanent dentitions of 1650 Japanese children. *Int. J. Paediatr. Dent.*, 6:87-94.
- Udom TH, Terrence J (1998). Prevalence of dental anomalies in orthodontic patients. *Aust. Dent. J.*, 43:395-398.
- Vahid-Dastjerdi E, Borzabadi-Farahani A, Mahdian M, Amini N (2011). Supernumerary teeth amongst Iranian orthodontic patients. A retrospective radiographic and clinical survey. *Acta Odontol. Scand.*, 69:125-128.
- Kositbowornchai S, Keinprasisit C, Poomat N (2010). Prevalence and distribution of dental anomalies in pretreatment orthodontic Thai patients. *KDJ*, 13:92-100.
- Guttal KS et al. (2010) Frequency of developmental dental anomalies in the Indian population. *Eur J Dent* 4, 263-269.
- Gupta et al. (2011) Prevalence and distribution of selected developmental dental anomalies in an Indian population. *Journal of Oral Science*, Vol.53:231-238.
- Darwazeh AM, Hamasha AA, Pillai K (1998) Prevalence of taurodontism in Jordanian dental patients. *Dentomaxillo fac Radiol* 27,163-165.
- MacDonald-Jankowski DS, Li TTL (1993). Taurodontism in a young adult Chinese population. *Dentomaxillo fac Radiol* 22, 140-144.
- Ruprecht A, Batniji S, Sastry KARH, El-neweihi E. The incidence of dental invagination. *J Pedod* 1986;10:265-72.