Prevalence of dental anomalies in south Indian population attending orthodontic treatment

V Chandrika¹, Colooru Madhuri², Sarath Chandra Sahu³, Yagnesh M⁴, Sri Harsha Yelchuru⁵*¹

¹,³,⁴Assistant Professor, Dept. of Orthodontics and Dentofacial Orthopaedics, Anil Neerukonda Institute of Dental Sciences (ANIDS) Visakhapatnam, Andhra Pradesh, ²Assistant Professor, Dept. of Orthodontics and Dentofacial Orthopaedics, GITAM Dental College, Visakhapatnam, Andhra Pradesh, ⁵Assistant Professor, Dept. of Orthodontics and Dentofacial Orthopaedics, Narayana Dental College, Nellore, Andhra Pradesh, India

*Corresponding Author:
Email: drharshayelchuru86@gmail.com

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 (1.6%), dens evaginatus (1.6%), dens invaginatus (0%), and Macroodontia (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. Lind 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 Rose 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 Kotsomitis et al. 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 Freer 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 al 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 orthopantamograms 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 Macroodontia (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>
<thead>
<tr>
<th>Table 1: Distribution of dental anomalies among gender</th>
<th>Male (30)</th>
<th>Female (104)</th>
<th>Total (134)</th>
<th>P- Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developental Anomalies</td>
<td>N %</td>
<td>N %</td>
<td>N %</td>
<td></td>
</tr>
<tr>
<td>Agenesis</td>
<td>2 6.7</td>
<td>16 15.3</td>
<td>18 13.4</td>
<td>0.04</td>
</tr>
<tr>
<td>Supernumerary tooth</td>
<td>2 6.7</td>
<td>2 1.9</td>
<td>4 2.9</td>
<td>1</td>
</tr>
<tr>
<td>Evagination</td>
<td>0 0</td>
<td>4 3.8</td>
<td>4 2.9</td>
<td>0.85</td>
</tr>
<tr>
<td>Dens Invaginatus</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>Peg Laterals</td>
<td>2 6.7</td>
<td>8 7.6</td>
<td>10 7.4</td>
<td>0.75</td>
</tr>
<tr>
<td>Microdontia</td>
<td>0 0</td>
<td>6 5.7</td>
<td>3 4.4</td>
<td>0.64</td>
</tr>
<tr>
<td>Macrodontia</td>
<td>0 0</td>
<td>0 0</td>
<td>0 0</td>
<td></td>
</tr>
<tr>
<td>Dilaceration</td>
<td>4 13.3</td>
<td>14 13.4</td>
<td>18 13.4</td>
<td>0.55</td>
</tr>
<tr>
<td>Missing 8’s</td>
<td>20 66.6</td>
<td>76 73</td>
<td>96 71.6</td>
<td>0.02</td>
</tr>
</tbody>
</table>

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 and missing 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 and 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.4 (11.5%) and Hattabet al5 (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.

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 dilacerations 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 UsIuet al10 Altug-Atacel 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 al. (2014) 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 al. (2015) reported a 0.74% frequency of supernumerary teeth which in concurrence with the frequency of 0.66% in the present study, whereas Udom et al. (2014) 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 (Kositbowornchaichai et al., 2016, 2010).

Previous studies have reported a prevalence of 0.05% and 6.4% for Dens evaginatus in various ethnic populations. In the present study, it was found to be 0.66%. Microdontia was seen in 1% of the sample & was present in a generalised form. Darwazeh (1986) in his study reported 8% prevalence of microdontia whereas it was not seen in any of the patients in the present study. A study by MacDonald-Jankowski and Li (2008) in an 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 al. (2018) study. The prevalence was much higher than 1.7 per cent reported by Ruprecht et al. (1986) whereas in our sample, none of the cases of Invagination 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