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ABSTRACT

The aim of this study was to determine the distribution of hypodontia seen in patients in the orthodontic clinic in Kota Kinabalu. Retrospective analysis of records of 667 orthodontic patients (mean age 15.2 years) from 1992 - 1996 showed hypodontia in the permanent dentition to be 5.8% in males and 4.2% in females. The most frequently missing tooth was the mandibular incisor (48.5%) followed by the mandibular second premolar (24.2%), maxillary second premolar (15.2%) and maxillary lateral incisor (12.1%). More than 95% of the patients affected had one or two missing teeth. No missing canines or molars were found.

INTRODUCTION

One of the commonest dental anomalies is the developmental absence of one or more teeth in the dentition and this condition is known as hypodontia. It is important to identify this disorder as early as possible as it may occur in association with other dental anomalies such as hyperdontia, taurodontism, ankylosis of primary teeth, enamel hypoplasia, microdontia, conical incisors and disturbance in tooth eruption and exfoliation. Hypodontia may also occur in association with generalized syndromes such as hypohidrotic ectodermal dysplasia, Ellis Van-Creveld syndrome, Down’s syndrome, cleft lip and palate, whereby functional and aesthetic disability may be quite severe. Numerous reports have appeared in the dental literature throughout the years on the subject of congenital variations in the number and distribution of teeth missing in the permanent dentition.

The prevalence of hypodontia has been reported to be in the range of 2.3 - 10% and the tooth most commonly absent was the second premolar in most Caucasian populations. However, some recent studies in the Asian population reported the mandibular incisor as the most frequently missing tooth contrary to that found in the Caucasian population. The varied results reported may be due to many factors, for instance, the fact that the material has not always been representative, that the methods of examination have been different, different age groups studied or it may be that ethnic variation play a significant part in the aetiology.

There was no available data on the distribution of hypodontia in Sabah whose population comprised mainly of the ethnic Kadazandusun, Bajaus, Malays, Chinese and other indigenous groups.

The main aim of this study was to determine the distribution of hypodontia seen in patients of Asian ethnic origin in Sabah and to compare the results with similar studies in other populations.

MATERIALS AND METHODS

The subjects for this study were selected from files of orthodontic patients who were treated at the main dental clinic in Kota Kinabalu from 1992 to 1996. Only files that had complete treatment records and orthopantomogram radiographs were included in the study. All the patients selected were of Asian ethnic origin. 667 patients comprising 242 males and 425 females with a mean age of 15.2 years satisfied the criteria and were included in this study. A tooth was registered as developmentally missing when no trace could be found on the radiograph and the treatment records confirmed that the tooth had not been

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RESULTS

Of the 667 patients investigated, 32 had one or more teeth missing. (Table 1) The combined prevalence of hypodontia was 4.8%, with 5.8% in males and 4.2% in females respectively. As to the distribution of missing teeth, Table 2 shows that the mandibular incisors were the most frequently absent followed by the mandibular second premolars, the maxillary second premolars and maxillary lateral incisors. Table 3 shows that most of the subjects (96.9%) had only one or two missing teeth. There was only one patient with three missing teeth. No missing maxillary central incisors, canines or molars were found. It was difficult to distinguish between the mandibular central and lateral incisor teeth in some cases, hence the mandibular incisors were taken as a group.

Table 1. Distribution of subjects with hypodontia

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number of subjects</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Affected</td>
<td>Examined</td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>242</td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>425</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>667</td>
</tr>
</tbody>
</table>

Table 2. Distribution of the missing teeth

<table>
<thead>
<tr>
<th>Teeth</th>
<th>Male</th>
<th>Female</th>
<th>Combined</th>
<th>Total number of teeth missing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxillary lateral incisor</td>
<td>3</td>
<td>2</td>
<td>5 (15.2%)</td>
<td>6 (12.5%)</td>
</tr>
<tr>
<td>Mandibular incisor</td>
<td>3</td>
<td>13</td>
<td>16 (48.5%)</td>
<td>23 (47.9%)</td>
</tr>
<tr>
<td>Maxillary second premolar</td>
<td>3</td>
<td>1</td>
<td>4 (12.1%)</td>
<td>7 (14.6%)</td>
</tr>
<tr>
<td>Mandibular second premolar</td>
<td>5</td>
<td>3</td>
<td>8 (24.2%)</td>
<td>12 (25.0%)</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>19*</td>
<td>33</td>
<td>48</td>
</tr>
</tbody>
</table>

* One patient had 3 missing teeth (mandibular incisor and second premolars)

(%) in parentheses denotes the percentage of that category

Table 3. Distribution of subjects with different degrees of hypodontia

<table>
<thead>
<tr>
<th>Number of missing teeth per patient</th>
<th>Female</th>
<th>Male</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>9</td>
<td>7</td>
<td>16 (50.0%)</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
<td>8</td>
<td>15 (46.9%)</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>-</td>
<td>1 (3.1%)</td>
</tr>
<tr>
<td>Total</td>
<td>17</td>
<td>15</td>
<td>32</td>
</tr>
</tbody>
</table>

(%) in parentheses denotes the percentage of that category
DISCUSSION

The prevalence of hypodontia in the present study was 4.8% which was comparable to previous studies carried out in Caucasian and Asian children. This was also in agreement with some of the studies done on adults and in children undergoing orthodontic treatment. However, O'Dowling and McNamara reported higher prevalence of 11.3% in Irish schoolchildren. Most studies reported that the majority of patients with hypodontia had only one or two teeth missing which varied between 75-90% and this was similarly seen in the present study. No missing maxillary central incisors, canines or molars were found in the current investigation although other studies with larger samples have reported that any tooth in the permanent dentition can be missing and with more teeth missing, ranging from one to eight teeth.

Certain teeth were missing more frequently than others were and there appears to be some controversy regarding the most frequently missing teeth. Earlier studies on Caucasian subjects found that the mandibular second premolar was the most frequently absent, followed by the maxillary lateral incisor and the maxillary second premolar. However others reported the maxillary lateral incisor as the most commonly absent tooth.

In the present investigation, the mandibular incisor was the most frequently missing permanent tooth, occurring about twice as frequent as the mandibular second premolar and four times that of the maxillary lateral incisor. Similar findings have been reported in West Malaysian children and Southern Chinese in Hong Kong. An earlier study by Hussein on 1,583 orthodontically treated West Malaysian children, reported the mandibular incisor as the most frequently missing tooth (32.1%), followed by the maxillary lateral incisor, mandibular second premolar and the maxillary second premolar.

In a more recent study on 14 year-old West Malaysian children, Hussein and Majid found that mandibular incisor agenesis was the commonest (49.2%) followed by maxillary lateral incisor (37.3%), maxillary second premolar (8.5%) and mandibular second premolar (5.1%). Here the incidence of missing second premolar teeth was surprisingly low despite the fact that radiographs were not used in their study to diagnose hypodontia. The prevalence may be overestimated here since some may in fact be unerupted or late forming. Davis who investigated hypodontia in Southern Chinese children in Hong Kong reported an overall prevalence of 6.9% and similarly found mandibular incisor agenesis the most frequent (58.7%). This was in contrast to most studies in the Caucasian population which reported that mandibular incisor agenesis was rare. However, studies carried out on Saudi Arabian and Indian children reported similar findings as the Caucasian population with a low incidence of mandibular incisor agenesis. Anthropologically they belong to the Caucasoid group, which may explain the similar findings.

The literature showed that many studies carried out in Caucasian and Asian, subjects reported a higher prevalence in females. and Ravn and Nielsen reported higher prevalence in males, although it was not statistically significant, whereas others found no difference between the sexes. In the present study, the prevalence was higher in males. Brook suggested that this sex predilection be attributed to genetic factors, which occasionally is modified by environmental factors.

CONCLUSION

Mandibular incisor agenesis was found to be the commonest form of hypodontia in this study in Sabah although the overall distribution of hypodontia was similar to other Asian and Caucasian populations. This study strengthens the increasing evidence of a relationship between the distribution of tooth agenesis and ethnicity.

REFERENCES


