Demographic Study of hypodontia in samples of Iraqi patients

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Abstract:
Hypodontia means congenitally missing teeth, and considers most frequently oral alteration in human. One hundred and seventy five of hypodontia patients were matriculated in this study, (129 female and 46 male) having at least one missing tooth and no more than 6 missing teeth were represented as patients group, and 10 control group consists of apparently healthy subjects (6 female and 4 male) the age of both groups ranged from 14 years to 65 years. Buccal swabs were collected from patients seeking orthodontic treatment who attended Al-Huaizi Dental Clinic at AL-Harethia district- Baghdad in a period between the beginning of October 2013 to the end of April 2014. Hypodontia was diagnosed according to the history of patients, clinical examination orthopantomogram (OPG), and dental casts. The result of demographic study revealed that hypodontia was found in 129 of females which were more than that in males (46) with significant difference (p < 0.05). The ratio of females to males was 2.8:1. The missing teeth in hypodontia patients were found in right, left or both sides. The outcome of present study revealed that in the right side 37, in the left side 48 while 90 in both sides with non-significant differences and the anterior missing teeth (81) were more than posterior (36) and both regional (31). It was found that hypodontia was more common in the maxilla, upper jaw (73) than that in mandible, lower jaw (65) and in both jaws (37) with no significant difference.

Key Words:

Introduction
The term hypodontia refers to the congenital agenesis of one or more teeth (up to six) except third molars. When this number exceed six the condition is designated as oligodontia, while anodontia denoting complete absence of teeth. The congenital absence of teeth results from disturbances during the initial stages of tooth formation: initiation and proliferation. Hypodontia can occurs as an isolated anomaly (non-syndromic) or as part of a multiple congenital anomaly (MCA).

Han et al., 2008, Anziani et al., 2010, Ramazanzadeh et al., 2013

Population studies have revealed that the prevalence of hypodontia differs with regard to the permanent and primary dentitions, tooth type, and racial groups. The prevalence of hypodontia varies from 0.03 to 10.1 per cent in various populations. In the primary dentition, the prevalence is between 0.5 and 0.9 per cent, while oligodontia is rare, with an estimated prevalence of 0.25 per cent. Differences in prevalence between racial groups have been reported as: 1.5–3 per cent in Caucasians, 6–9.2 per cent in Orientals, and 7.7 per cent in Afro-Americans (Vastardis, 2000; Mattheeuws et al., 2004).

In Iraq few studies were conducted in hypodontia AL-Jawadi (2009) mentioned that hypodontia mostly observed in in maxillary lateral incisors and mandibular second premolar.

Subjects, materials and methods

Subjects
One hundred and seventy five cases were matriculate in this study, 129 female and 46 male having at least one missing tooth and no more than 6 missing teeth represent as patients group, and control group consists of 10 apparently healthy subject (6 female and 4 male) the age of both groups ranged from 14 years to 65 years.

Samples were gathered from patient seeking orthodontic treatment who attend Al-Huaizi dental clinic at AL-Harthia district, Baghdad in a period between the beginning of October 2013 to the end of February 2014.

Information was taken from the subjects according to a questionnaire that include name, gender, age, family history, and place of residence.

Hypodontia was diagnosed according to the history, clinical examination orthopantomogram (OPG), and dental casts.

Results and Discussion

This part of work carried out to evaluate the frequency of hypodontia in males and females and compared its appearance in left and right sides, and posterior and anterior regions in upper and lower jaws. The diagnosis of missing teeth was based on both clinical and radiographic examination (Figure 1). Retrospective dental information was collected from dental files.

Distribution of hypodontia patients according to gender

The result of current study revealed that hypodontia was diagnosed in 129 (77.9%) females which was more than that in males 46 (22.1%) with significant difference (p < 0.05) as shown in figure (2). The ratio of females to males was 2.8:1.

Tooth agenesis in permanent dentation occurs more commonly in females than males and is more often associated with nonsyndromic than syndromic ones (Shimizu and Maeda, 2009). Strong evidence by many studies reported similar result in this field, and confirmed that tooth agenesis is more frequent in females than in males (Matthee uws et al., 2004; Celikoglu et al., 2010).

Figure 1: Female patient with hypodontia
It has been found that the prevalence of hypodontia in females was higher in Europe and Australia than in North America (Flores – Mir, 2005). While Grace et al. (2014) mentioned that Females showed a higher weighted prevalence of hypodontia than did males (7.02% vs. 4.72%, respectively: p=0.06) when they studied the prevalence of hypodontia in children of 10 to 14 year old in Puerto Rico.

Regional distribution of missing teeth among hypodontia patients:

Distribution of missing teeth according to right and left sides

The missing teeth in hypodontia patients were found in right, left or both sides. The outcome of present study revealed that the number of hypodontia patients, who had missing teeth in the right side were 37 (21.2%), in the left side were 48 (27.4%) while in both sides reached to 90 (51.4%) with non-significant differences, as shown in figure (3) that means, the occurrence of hypodontia was bilaterally more than unilaterally. The distribution of missing teeth in right and left sides according to gender emerged that in females were 30 (23.2%) in right side, 37 (28.7%) in left side and 62 (48.1%) in both sides with non-significant differences, whereas in males the missing teeth were 7 (15.2%), 11 (24%), and 28 (60.8%) in right, left and both sides respectively with non-significant differences (Figure 4). It was seemed that missing teeth were more in bilateral than unilateral for both gender.

The results of current study came in accordance with Study of Amini et al. (2012) when they observed bilateral missing was about twice as frequently as unilateral missing, whereas came in contrast to study conducted by Harris et al.(2011) who noticed that tooth missing found to occur more often unilaterally than bilaterally. Other researchers also observed unilateral hypodontia, was common, with no significant difference between the left and right sides of the jaws (Magnusson, 1977; Lai and Seow, 1989).

On this subject, it was found that in general, unilateral missing is more common than bilateral hypodontia.
Figure 3: Distribution of hypodontia patients according to the side (left and right) of missing teeth.

Figure 4: Distribution of missing teeth according to the left and right sides among females and males patients

**Distribution of missing teeth according to anterior and posterior region**

The current results revealed that the missing teeth in anterior region found in 81 (46.%) patients were higher than that in posterior region, 63 (36%) while the least in both regions which recorded in 31 (18%) patients as shown in figure (5).

The outcome of distribution of missing teeth according to anterior posterior, and both regions in both genders, represented that 56 (43.5%) females had most missing teeth in the anterior region, 50 (38.7%) in posterior, while in
both regions 23 (17.8%). Whereas, 25 (54.3%), 13 (28.3%) and 8 (17.4%) of males had missing teeth in anterior, posterior and both regions respectively with non-significant differences (Figure 6). However, few studies evaluated the difference between the hypodontia rates into anterior and posterior regions (Ng’ang’a and Ng’ang’a, 2001; Celikoglu et al., 2010).

Figure 5: Distribution of missing teeth according to anterior and posterior region among hypodontia patients.

Figure 6: Distribution of missing teeth according to anterior and posterior region among females and males of hypodontia patients.
Distribution of missing teeth according to maxilla (upper jaw) and mandible (lower jaw)

According to the literatures, there seems to be no overall significant difference between the prevalence of hypodontia in the maxilla and mandible (Sliva, 2003; Polder et al., 2004). The result of the present study revealed that missing teeth was more common in the upper jaw or maxilla (73, 42%) than that in lower jaw or mandible (65, 37%) and in both jaws (37, 21%) with no significant difference (figure 7). The recorded results in females were 53 (41.1), 47 (36.5%), and 29 (22.5%) while in males 20 (43.5%), 18 (39.1%) and 8 (17.4%) for upper, lower, and both jaws respectively with non-significant difference (figure 8).

This result was in line with some studies (Sisman et al., 2007; Celikoglu et al., 2010, Fekonga et al., 2014) and in contrast to some others, which had found a greater missing rate in the mandible (Chung et al., 2008). Abdul Salam et al. (2010) in a study conducted on 51 patients of hypodontia in Pakistan reported that the number of missing teeth were more in mandible (42.55%) as compared to maxilla (35.45%).

![Distribution of missing teeth according to upper and lower jaws](image1)

**Figure 7:** Distribution of missing teeth according to upper and lower jaws

![Distribution of missing teeth according to upper and lower jaws in females and males](image2)

**Figure 8:** Distribution of missing teeth according to upper and lower jaws in females and males
Grouping of patients according to number of missing teeth

In this study most of patients (males and females) missed one or two teeth, the result revealed, 80 (45.8%) of total patients from both gender missing one tooth, 62 and 18 for females and males respectively, and 58 (33%) missing two teeth 40 and 18 for females and males respectively, while thirteen (7.4%) (10F. and 3M.) and ten (5.7%) (6F. and 4M.) Patients were missed three and four teeth respectively. Similar result, only seven (4%) patients missed five (6F. and 1M) and six teeth (5F. and 2M.) as shown in table (1).

Table 1: Grouping of hypodontia patients according to number of missing teeth

<table>
<thead>
<tr>
<th>No. of missing teeth</th>
<th>1 tooth</th>
<th>2 teeth</th>
<th>3 teeth</th>
<th>4 teeth</th>
<th>5 teeth</th>
<th>6 teeth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>62</td>
<td>40</td>
<td>10</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>18</td>
<td>18</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>80</td>
<td>58</td>
<td>13</td>
<td>10</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Percentage</td>
<td>45.8</td>
<td>33</td>
<td>7.4</td>
<td>5.8</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Frequency of missing teeth

Present results showed that the Maxillary lateral incisor was the most frequently missing tooth (124), the second most missing tooth was mandibular second premolar (101) followed by lower central incisor (33) the upper second premolar came in fourth place (27) as shown in table(2).

Table 2: Maxilla-mandibular distribution of missing teeth in hypodontia patients.

<table>
<thead>
<tr>
<th>Type of tooth</th>
<th>CI</th>
<th>LI</th>
<th>C</th>
<th>PM1</th>
<th>PM2</th>
<th>M1</th>
<th>M2</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maxilla</td>
<td>6</td>
<td>124</td>
<td>5</td>
<td>6</td>
<td>27</td>
<td>8</td>
<td>3</td>
<td>179</td>
</tr>
<tr>
<td>Mandible</td>
<td>33</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>101</td>
<td>16</td>
<td>15</td>
<td>171</td>
</tr>
</tbody>
</table>

CI (central incisor); LI (lateral incisor); C (canine);
PM1 (first premolar); PM2 (second premolar); M1 (first molar);
M2 (second molar).
Current results was confirmed by other local study by Al.Jwadi (2009), she mention that hypodontia mostly seen in maxillary lateral incisors, and mandibular second premolar followed by lower central incisors.

Similar finding reported by Celikoglu et al. (2010) who mentioned in their study that the frequently missing teeth were the maxillary lateral incisors, followed by mandibular second premolars.

Larmour et al. (2005) also notified that maxillary lateral incisors are more commonly missing than mandibular incisors in Caucasians.

The maxillary lateral incisors are absent in about 2.5% of the population, whereas the mandibular central incisors are absent in less than 1% (Stevenson et al., 1993). In different with Wu et al. (2007) who observed that mandibular incisors were found to be the most commonly absent teeth in Chinese and Japanese populations and was more prevalent than missing maxillary lateral incisors. Similar findings have been reported in local Malaysian children where the prevalence of missing mandibular incisors was the highest among developmentally missing teeth (Nik, 1995; Loke 1999).

In a meta-analysis by Polder (2004), the mandibular second premolar was found to be the most frequently missing tooth in 6 out of 9 surveys, which was followed by the maxillary lateral incisor in the other 3 surveys. He also reported that hypodontia of the canines, upper central incisors, and upper and a lower first molar is rare.

Abdul Salam et al. (2010) in their study on 51 patients of hypodontia in Pakistan reported that mandibular second premolar (21.27%) was the tooth most frequently found missing followed by maxillary lateral incisors (18.23%) and majority of patients (48.94%) had one or two teeth missing were more on left side (42.55%) as compared to right (35.45%) side and more in posterior (40.52%) as compared to anterior (37.48%) region.

Different results were found in other studies, as investigation of Swedish and Singaporean Chinese subjects, had reported that the mandibular central incisors were the most likely to be missing in those populations (Mok and Ho, 1996; Bäckman and Wahlin, 2001). Also Nunn et al. (2003) had observed that the most frequently missing teeth in hypodontia cases are the mandibular central incisor.

While other investigators had reported that upper second premolar being the most frequently missing tooth (Rolling and Poulsen, 2001)

It is important to point out that agenesis of maxillary central incisors canines, and first permanent molars reportedly is very rare

Tavajohi-Kermani et al., 2002.

These differences found in results may not give us clear view on population differences, however, but could be the result of variations in data collection, sampling methodology, and participants’ gender.

References


