Prevalence of Hypodontia in a Sample of Spanish Dental Patients

Introduction

Hypodontia is a congenital absence of teeth or congenital dental aplasia. It is one of the most common dental anomalies, which can adversely affect both aesthetics and function. It is one of the results of alterations during the early stages of development (1).

The etiology of hypodontia is multifactorial. The most supported theory suggests a polygenic mode of inheritance, with genes and environmental factors that exert some influence on the phenotypic expression of the genes involved (2).

The hypodontia, in our study, was evaluated from panoramic radiographs as in many other studies (3, 4). It can be said that there is great variability in the figures obtained regarding the percentage of prevalence of hypodontia by different authors ranging from 4.28% to 8.5% (5, 6, 7).

The most frequently affected teeth are the second lower premolars, followed by the upper lateral incisors or the upper second premolars (8). Based on gender, hypodontia is more frequent in women (9, 10).

This study aimed to evaluate the prevalence of hypodontia in a sample of children aged 7–11 at the University Alfonso X el Sabio (Madrid).
Materijali i metode

Općenito, svrha ovog retrospektivnog istraživanja bila je procijeniti prevalenciju hipodoncije kod 2500 djece u dobi između sedam i jedanaest godina, što je uključivalo 500 sedmogodišnjih pacijenata – 247 djevojčica i 253 dječaka; 500 osmogodišnjih pacijenata – 242 djevojčice i 258 dječaka; 500 devetogodišnjih pacijenata – 232 djevojčice i 268 dječaka; 500 desetogodišnjih pacijenata – 249 djevojčica i 251 dječak; i konačno 500 jedanaestogodišnjih pacijenata – 265 djevojčica i 235 dječaka. Panorama Rendsgenske snimke unatrag deset godina odabrane su slučajno.

Primijenjeni su sljedeći kriteriji za uključivanje: pacijenti rođeni između 2004. i 2009., pacijenti Sveučilišne klinike Sveučilišta Alfonsa X. Mudroga između 2014. i 2016. godine, pacijenti s panoramskim rendgenskim snimkama i oni bez povijesti gubitka zuba zbog kariješa ili traume.

Kriteriji za isključivanje iz istraživanja bili su sljedeći: pacijenti s kraniofacijalnim sindromima ili razvojnim poremećajima, oni s povijestu vađenja zuba prema dokumentaciji, ili oni bez panoramskih rendgenskih snimaka te loše rendgenske snimke.

U istraživanju su analizirani spol, zubi, čeljust i strana na kojoj je ageneza bila češća kod uključenih pacijenata u dobi od sedam do jedanaest godina. Razlike su analizirane s pomoću testa $\chi^2$ ili Fisherova testa. Statistička analiza obavljana je upotrebom Ponačene kvadrate.

Materials and methods

The main objective of this retrospective study was to evaluate the prevalence of hypodontia in 2500 children between seven and eleven years of age, which included 500 seven-year-old patients, out of which 247 were females and 253 males; 500 eight-year-old patients, out of which 242 were females and 258 males; 500 nine-year-old patients, 232 of whom were females and 268 males; 500 ten-year-old patients, out of which 249 were females and 251 males; and finally 500 eleven-year-old patients, of which 265 were females and 235 males. The panoramic radiographs which were less than 10 years old were randomly evaluated according to the following criteria:

The following were the inclusion criteria: patients born between the years 2004–2009, current patients of the university clinic of the Alfonso X El Sabio University who were being treated between 2014–2016, patients with panoramic radiography performed at the Alfonso X El Sabio University, and patients with no history of extractions because of decay or dental trauma.

The following were the exclusion criteria: patients with craniofacial syndromes or developmental disorders, patients with a history of extractions according to dental records, patients without panoramic x-ray taken at Alfonso X El Sabio University, and radiographs in poor condition.

| Tablica 1. Učestalost nedostatka zametaka po zubu | Table 1 Prevalence of dental agenesis per tooth | Zub • Tooth | Ageneza • Dental agenesis (n) | % |
|-----------------------------------------------|-----------------------------------------------|-------------|-------------------------------|---|
| 17                                           | 0                                             | 0           |
| 16                                           | 0                                             | 0           |
| 15                                           | 16                                            | 0.64        |
| 14                                           | 1                                             | 0.04        |
| 13                                           | 0                                             | 0           |
| 12                                           | 20                                            | 0.8         |
| 11                                           | 1                                             | 0.04        |
| 21                                           | 0                                             | 0.04        |
| 22                                           | 20                                            | 0.8         |
| 23                                           | 0                                             | 0           |
| 24                                           | 1                                             | 0.08        |
| 25                                           | 15                                            | 0.6         |
| 26                                           | 0                                             | 0           |
| 27                                           | 0                                             | 0           |
| 37                                           | 0                                             | 0           |
| 36                                           | 0                                             | 0           |
| 35                                           | 29                                            | 1.16        |
| 34                                           | 2                                             | 0.08        |
| 33                                           | 1                                             | 0.04        |
| 32                                           | 5                                             | 0.2         |
| 31                                           | 3                                             | 0.12        |
| 41                                           | 3                                             | 0.12        |
| 42                                           | 3                                             | 0.12        |
| 43                                           | 1                                             | 0.04        |
| 44                                           | 2                                             | 0.08        |
| 45                                           | 20                                            | 0.8         |
| 46                                           | 0                                             | 0           |
| 47                                           | 0                                             | 0           |
Hipodontija u uzorku španjolskih pacijenata

Ayala Sola i sur.

Raspis

Hipodontija je predmet istraživanja na mnogim sveučilištima i u mnogim specijaliziranim klinicama jer je to vrlo česta anomalija kod ljudi. U ovom istraživanju postoje i neka ograničenja, kao što je činjenica da nismo uzeli u obzir etničku prirodu istraživača, subjekta u studiju, a u mnogo drugih specijaliziranih klinicama jer je to vrlo česta anomalija kod ljudi. U ovom istraživanju nije bilo potrebnog etičkog odobrenja.

Rezultati

Uzorak od 2500 uključenih pacijenata činilo je 1235 djevojčica, od kojih 41 s hipodoncijom (3,31 %) i 1265 dječaka – njih 46 imalo je agenezu najmanje jednog zuba (3,63 %).

Nije bilo značajne razlike u hipodontiji između ispitanika i ispitanica (p > 0,05).

Četvrtdeset pacijenata (1,6 %) imalo je agenezu u gornjoj čeljusti, 39 (1,56 %) u donjoj i devet (0,36 %) u objema; nisu pronađene statistički značajne razlike između gornje i donje čeljusti (p > 0,05). Češće je zabilježena hipodontija u jednoj čeljusti negoli u objema (p < 0,0001). Ukupno 50 pacijenata (2,24 %) imalo je jednostranu hipodontiju, a 43 (1,72 %) obostranu, no razlika nije bila statistički značajna (p > 0,05). Ukupno 38 pacijenata (1,92 %) imalo je agenezu jednog zuba, a 40 (1,6 %) višestruku. Ni ta razlika nije bila statistički značajna (p > 0,05). Tablica 1. pokazuje da s uži najčešće pogođeni agenezom drugi donji pretkutnjaci, a slijede gornji bočni sjekutići. Nije pronađena hipodontija prvih gornjih i donjih kutnjaka, drugih gornjih i donjih kutnjaka te donjih očnjaka.

U ovom istraživanju nije pronađena dentalna agenezna u mlječnoj dentici.

Results

The sample of 2500 patients studied consisted of 1235 females, out of which 41 presented hypodontia (3.31%) and 1265 males, out of which 46 had at least a dental agenesis (3.63%).

There was no significant difference in proportion of hypodontia between males and females (p > 0.05).

40 patients (1.6%) had agenesis on the upper quadrants, 39 (1.56%) on the lower and 9 (0.36%) on both; no differences were found between upper and lower (p > 0.05); there was a higher proportion of hypodontia in only one jaw than in both jaws (p = 0.0001). 56 patients (2.24%) had unilateral hypodontia and 43 of them had (1.72%) bilateral, but the difference was not significant (p > 0.05). 48 (1.92%) patients had single agenesis, whereas 40 (1.6%) had multiple agenesis. Again, the difference was not significant (p > 0.05). Table 1 shows that the teeth more affected by agenesis were lower second premolars, followed by upper lateral incisor. No hypodontia of the upper and lower first molars, upper and lower second molars, and lower canines has been found.

In this study, no dental agenesis was found in temporary dentition.

Discussion

Hypodontia is the object of study in many universities and in many specialized clinics, since it is a very frequent anomaly in humans. This study has some limitations, since we didn’t consider the ethnicity of each patient as some other articles do (11). In our study, syndromic patients were also ruled out; hence we did not obtain the knowledge of hypodontia’s prevalence in them, which is an interesting issue for future research (12).

We did not take into account the prevalence of hypodontia in the third molars, mainly because of patients’ age; the prevalence of hypodontia excluding third molars was 6.2% (women 8% and men 4.2%) according to Abed Al Jawad (13) and in another study, the prevalence was 9.7% (14). Both are higher than our results, which showed a prevalence of 3.48%, being 3.63% in males and 3.31% in females, also excluding third molars.

In other studies found in the literature, hypodontia is more frequent in women, although the differences found by gender are not significant (15, 16). Nevertheless, in our study, there were no significant differences in the hypodontia between men and women. Obers...
Hypodontia in a Sample of Spanish Patients

Slika 1. Postotci hipodoncije kod muških i ženskih ispitanika
Figure 1 Percentages of hypodontia in men and women.

Slika 2. Postotci obostrane i jednostrane hipodoncije kod muških i ženskih ispitanika
Figure 2 Percentages of bilateral and unilateral hypodontia in women and men.

Slika 3. Ukupni postotci hipodoncije kod 2500 pacijenata uključenih u istraživanje
Figure 3 Total hypodontia percentage of the 2500 patients studied.

Slika 4. Postotak nedostatka zametki jednoga ili više zuba kod muških i ženskih ispitanika
Figure 4 Percentage of single and multiple hypodontia in both women and men.

Slika 5. Postotak hipodoncije po pojedinom ispitaniku uključenom u istraživanje
Figure 5 Percentages of hypodontia per piece found in the patients studied.
Ni u našem istraživanju nije bilo statistički značajnih razlika u hipodonciji između muškaraca i žena. Podacii iz literature pokazuju da su u gornjem luku zubi s najvećim postotkom hipodoncije bili bočni sjekutići, a slijede drugi pretkutnjaci. U donjem luku to je bio drugi pretkutnjak, a zatim bočni sjekutići (17). Ovo je potpuno u skladu s rezultatima našeg istraživanja. Općenito, prema rezultatima različitih autora (18, 19, 20) najčešće zahvaćeni zubi su drugi donji pretkutnjaci, zatim gornji bočni sjekutići i drugi gornji pretkutnjaci. Jedno drugo istraživanje pokazuje češći nedostatak donjih bočnih sjekutića i drugih donjih pretkutnjaka (21).

U literaturi se nalaze postoćni dentalne ageneze kako slijedi: drugi donji lijevi pretkutnjak (5.9%), drugi donji desni pretkutnjak (5.1%), gornji lijevi bočni sjekutić (4.0%), drugi gornji desni pretkutnjak (3.1%), i drugi gornji lijevi pretkutnjak (3%) (22). Ostali zahvaćeni zubi su drugi donji pretkutnjak (20.7%) i drugi gornji pretkutnjak (10.2%) (23).

Postojeća literatura potvrđuje da je hipodoncija u gornjem luku češća (5.3%) negoli u donjem (3.5%) (24). U nekim dosadašnjim istraživanjima uočen je veći broj obostrane hipodoncije (68.9%) negoli jednostrane (31.1%) (25, 26, 27). To je suprotno rezultatima našeg istraživanja u koje mu je i kod muškaraca i kod žena zabijeljena veća učestalost jednostranih hipodoncija negoli obostranih.

U našem istraživanju bilo je 54 posto hipodoncija na lijevoj strani, a 46 posto na desnoj; pronalažemo 45.7 posto jednostranih hipodoncija i 54.3 posto višestrukih, a u drugim istraživanjima zabijeljeno je veći broj hipodoncija na desnoj strani negoli na lijevoj (28) te više pojedinačnih negoli višestrukih (11).

Druga istraživanja pokazuju da se oligodoncija (6 ili više zuba koji nedostaju) pojavljuje kod 0.8 do 1.4 posto pacijenata (29, 30). U našem istraživanju samo je kod 0.04 posto pacijenata nedostajalo najmanje šest zuba.

Zaključak

Postotak ageneze među 2500 uključenih pacijenata iznosio je 3.48 posto. U našem uzorku hipodoncija je bila češća kod pacijenata (3.63%) negoli kod pacijentica (3.31%), osim kod onih u dobi između osam i deset godina među kojima je zabijeljena veći postotak hipodoncije kod pacijentica. No nije bilo statistički značajne razlike u hipodonciji između dječaka i djevojčica (X² = 0.25, df = 1, p > 0.05, n = 2500). Osim trećih kutnjaka, zub koji je najčešće pogoden ageneizom u našem je uzorku bio drugi gornji pretkutnjak (34 – 50%), nakon čega je slijedio gornji bočni sjekutić (28,16%) i drugi gornji pretkutnjak (21,12%). Najrijed su nedostajali donji bočni sjekutić (7,04%), donji središnji sjekutić (4,22%), gornji središnji sjekutić (1,40%), gornji očnjak (1,40%), prvi donji pretkutnjak (1,40%) i gornji pretkutnjaci (0,70%).

Sukob interesa

Autori nisu bili u sukobu interesa.

Vizualizirane izvornike literature pokazuju da u gornjem arcu zubi koje imaju najvišu procentualnu frekvenciju hipodoncije su slijedeća: drugi gornji desni prekutnjak, drugi gornji lijevi prekutnjak, drugi gornji lijevi bočni sjekutić, gornji centralni sjekutić i drugi gornji lijevi sjekutić. U donjem arcu je bio drugi gornji pretkutnjak.

Sukob interesa

Autori nisu bili u sukobu interesa.

Conclusions

1. The percentage of total agenesis of 2500 patients studied was 3.48%.
2. In our sample, there was a greater number of hypodontia in males than in females. However, there was no significant difference in the hypodontia between men and women (x²=0.25, df=1, p>0.05, n=2500).
3. Excluding third molars, the tooth most affected by agenesis was in our sample was the second highest premolar tooth (34.50%), followed by the upper lateral incisor (28.16%), and the second superior premolar (21.12%). The least frequent absences were the lower lateral incisor (70.04%), the lower central incisor (4.22%), the upper central incisor (1.40%), the upper canine (1.40%), the first premolar inferior (1‘40%), and superior premolar (0.70%).

Conflict of Interest

None declared
Abstract

Objectives: The aim of this retrospective study was to evaluate the prevalence of hypodontia in a sample of dental patients, aged between seven and eleven years at a University Dental Hospital (Spain). Materials and Methods: The number of hypodontia cases and the most affected teeth were evaluated in 2500 panoramic radiographs in a random sample of dental patients consisting of 1235 females and 1265 males. We divided them according to age, number of hypodontia present in each patient (multiple or single), each side, each quadrant either in the upper jaw or in the mandible. The chi-square test ($P < 0.05$) was used to compare the differences in agenesis among males and females. Results: The sample of 2500 patients who were studied consisted of 1235 women, out of which 41 presented hypodontia (3.31%) and 1265 men, out of which 46 had at least a dental absence (3.63%). There was no significant difference in the proportion of hypodontia between men and women ($P > 0.05$). Conclusion: The percentage of total agenesis of 2500 patients studied was 3.48%.

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