

HYPODONTIA IN CHILDREN WITH AND WITHOUT CLEFT LIP AND PALATE - A CASE CONTROL STUDY

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Abstract

Hypodontia is a cranial malformation characterized by congenital missing of teeth. It is seen increased in cleft lip patients. It affects the tooth bud at the early to later stages of tooth development. This study was conducted to evaluate and compare the presence of hypodontia in children with and without cleft lip and palate. 89000 case sheets were reviewed from the dental treatment records for presence of hypodontia in children with and without cleft lip and palate from June 2019- March 2020. Inclusion criteria included patients above 3 years and below the age of 18 years with the presence of cleft lip and palate. Final sample size consist of 10 patients divided into two groups: 5 patients with cleft lip and palate and 5 patients without cleft lip and palate. Data was analysed using SPSS software and Mann-Whitney-U Test was done. The results showed that none of the cases with cleft lip and palate had hypodontia. Within the limitations of the study, there was lesser prevalence of hypodontia in children with cleft lip and palate when compared to children without cleft lip and palate.

KEYWORDS: Cleft lip, Cleft palate, Hypodontia, Non cleft groups.

Introduction

Oral health is important for general health.[1,2] This can be maintained by regular toothbrushing, frequent periodic application of fluorides and regular dental visits.[3–5]. Dental caries is a complex process of demineralization and dissolution of the substance of the teeth leading to cavitation[6]. In paediatric dentistry the most important concern to be noted is the loss of necrotic primary molars leading to loss of space. [7-13]

Congenital lack of tooth results from disturbances in the early stages of tooth development. A tooth is congenitally missing if it has not erupted in the oral cavity and is not visible in the radiograph[14]. Hypodontia is the term used to describe the phenomenon of congenitally missing teeth in general. The term is used in a narrow sense when the number of missing teeth is one or a few[15]. Primary teeth play an imperative role in improving the self-esteem of the preschool children and also plays a predominant role in speech development, esthetics, and function.[1] Clinicians often encounter patients with hypodontia, which usually causes oral health impairment [16]. Accurate diagnosis of hypodontia requires radiographic, clinical and dental cast examination to distinguish whether the teeth is extracted, impacted or congenitally absent. It is difficult to accurately distinguish between the adjacent similar teeth. Variation in the distribution and location of hypodontia have been reported across ethnic groups[17,18]. Notably, a higher incidence of missing mandibular incisors have been observed in chinese[19] [20] and japanese population[21,22] than in Caucasian population [23–25] suggesting that ethnicity factors into prevalence. A study was conducted to estimate the prevalence of hypodontia, evaluated patients who visited two geographically different orthodontic clinics and discussed the factors that may influence the prevalence of hypodontia including the difference between the type of dental clinic, gender, age and the type of malocclusion[16].

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Cleft lip and palate is one of the most common orofacial congenital malformations in line birth following dental caries that remains to persist as a serious oral health problem.[4]. It can occur individually or in combination with any other congenital deformities (16). The overall incidence of cleft lip and palate is approximately 1 in 700 live births[26] making cleft lip and palate the most common orofacial congenital malformation [27]. Affected Patients suffer from a increased number of problems and altering the functional and consequence of cleft lip and palate is a very challenging one. Cleft lip and palate is also accompanied by a increasing number of dental anomalies which has an increasing number of dental anomalies which inturn has a long term effect on patients effects on patients facial anatomy and self esteem[28]. Dental anomalies are considered a contributing factor in cleft formation [29]. The prevalence of hypodontia in isolated cleft group was reported to be four times than that of non cleft groups. The increased incidence of hypodontia in children with cleft can be due to the result of not only the factors causing cleft itself [30]. Proper diagnosis and treatment planning is essential to treat such oral conditions.[31,32] The aim of this study was to evaluate the presence or absence of hypodontia in children with and without cleft and palate.

MATERIALS AND METHODS:

This retrospective study was conducted as a hospital based university setting. Ethical approval for this study was granted by the institute's Ethical committee (Ethical approval number : SDC/SIHEC/2020/DIASDATA/0619-0320). Consent to use treatment records were obtained from parents/ guardians at the time of patients' entry into university for dental needs. The retrospective data were collected by obtaining and analysing the 89000 dental records of the university from June 2019-March 2020. Inclusion Criteria for the present study were children with cleft lip and palate, children from 3 years to 17 years old, complete data records with clinical examination and with photographic evidence. Exclusion criteria includes patients below 6 months age, incompletely available data ,improper photographs and censored records. Age and gender matched controls i.e., children without cleft lip and palate were taken according to the relevant cases obtained from the inclusion criteria.

The selected case and control group were examined by three people: one reviewer, one guide and one researcher. The patient's case sheets were reviewed thoroughly. Cross checking of data including digital entry and intra oral photographs was done by an additional reviewer as a measure to minimise the sampling bias, samples for the group were picked by simple random sampling. Digital entry of clinical examination and intra oral photographs of selected subjects were assessed and this included the assessment of presence of hypodontia as mentioned before by the examiner based on extraoral photographs and clinical examination of each tooth. A preset format was used to record the defects mostly by the examiner based on intraoral photographs and clinical examination data of each tooth.

The examiner was trained to add data for analysis as presence or absence of hypodontia for both case and control group by tabulation using excel software. Data analysis was done using SPSS PC version 23.0 (IBM;2016) software for statistics. The incidence of Hypodontia for both case and control group were compared by Mann Whitney U-Test.

RESULTS:

The final study sample size has a total of ten children, who were selected based on the required inclusion and exclusion criteria. The case group contained 5 children with cleft lip and palate. Among them 4 were males (80%) and 1 was female (20%). The control group (children without cleft lip and palate) contained 5 children who were age and gender matched to the case group.(Graph 1) None of the children in the case group (children with cleft lip and palate) had hypodontia. Whereas 20% of the children (n=1) showed hypodontia in the control group.(Graph 2) Mann Whitney U-test showed that there was no significant difference in the results obtained. (p-value > 0.05)

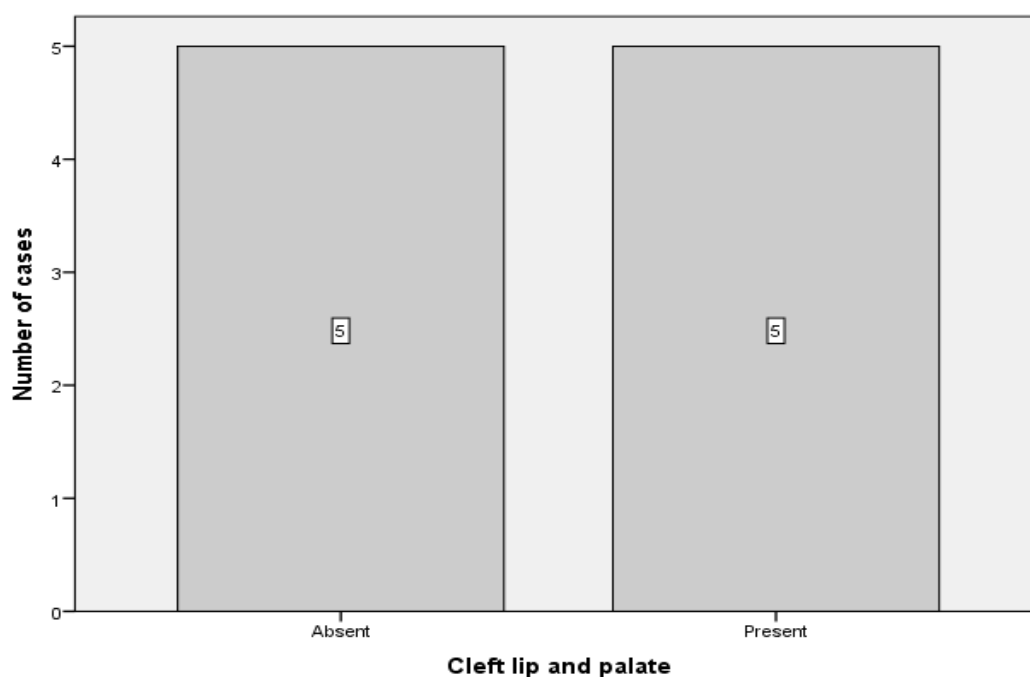


Figure 1: Bar graph representing number of cases in case group (children with cleft lip and palate) and control group (children without cleft lip and palate). X axis represents presence or absence of cleft lip and palate. Y-axis represents the number of patients. Note the equal distribution of cases in case and control group.



Figure 2 : Bar graph representing gender distribution of cases in case group (children with cleft lip and palate) and control group (children without cleft lip and palate). X-axis represents the presence or absence of cleft palate and Y-axis represents the number of cases. White colour represents males, Grey colour represents females. Note the equal distribution of gender in both the groups.

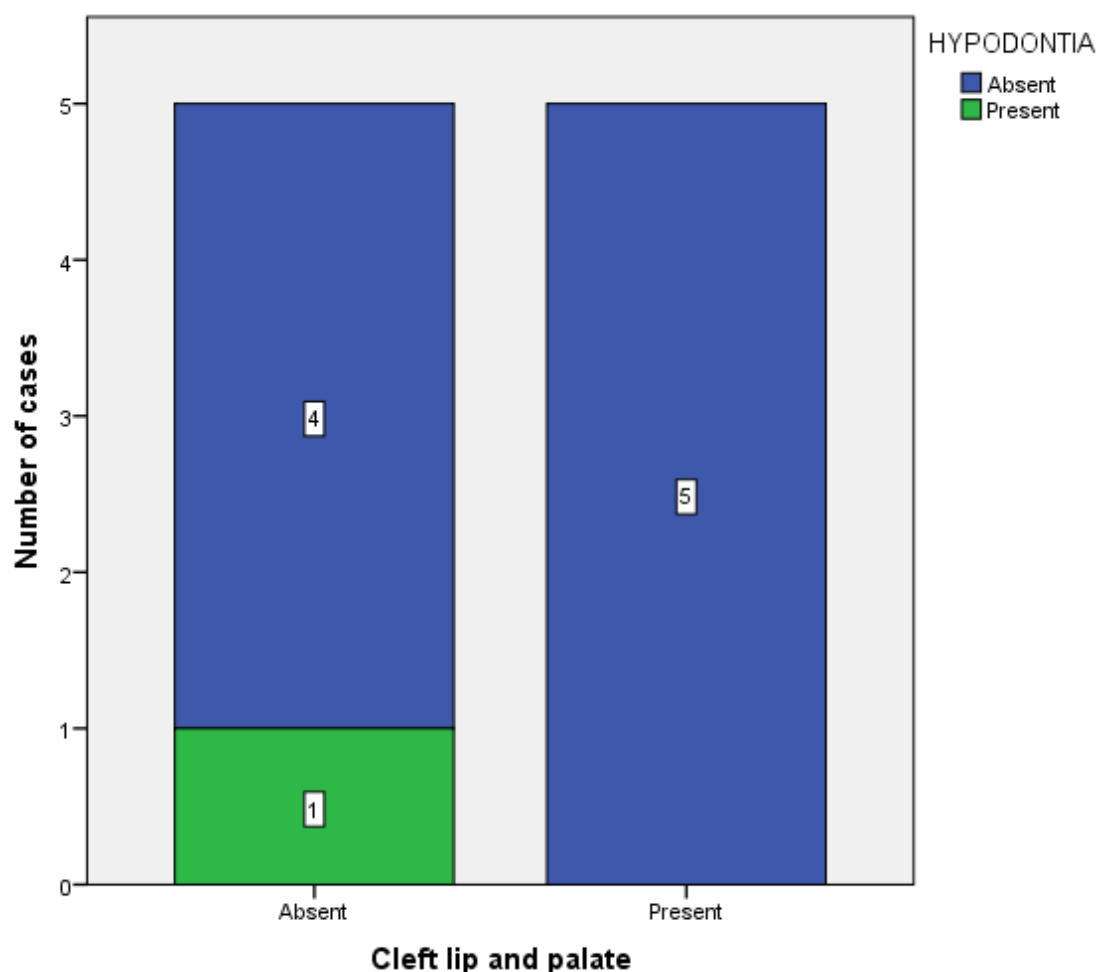


Figure 3 : Bar chart representing the prevalence of hypodontia among children with and without cleft lip and palate. X-axis represents the case and control group and Y-axis represents the number of children. Green colour denotes the presence of hypodontia, Blue colour represents the absence of hypodontia. Children with cleft lip and palate had lower prevalence of hypodontia when compared to children without cleft lip and palate. However this difference was not statistically significant (Mann - Whitney test; p value = 0.089, not significant)

DISCUSSION:

This study was conducted to evaluate the incidence of hypodontia in children with and without cleft lip and palate. Hypodontia is a condition where there are congenitally missing tooth/teeth which would eventually cause edentulous regions in the dentition. This could be due to the reason that, if there was presence of a cleft, the tooth bud in that region wouldn't have formed which would lead to the condition of it being congenitally missing. This would affect functions like esthetics and mastication. Assessing the incidence would be essential to do proper diagnosis and fabricate the best treatment plan as per the patient's needs.

Orofacial clefts or cleft lip and/or palate are opening or splits in the upper lip, roof of the mouth (palate) or both. Orofacial clefts are oral and facial malformations that occur very early in pregnancy, during the development phase inside the uterus. The lip forms between the fourth and seventh weeks of pregnancy. As a baby develops during the pregnancy phase, the body tissue and special cells from each side of the head will grow towards the

center of the face and join together to make the face. This joining of tissue will form facial features, such as the lips and mouth. Cleft lip and/or palate is a crucial public health problem affecting 1 in every 500 to 1000 births worldwide according to a World Health Organization study conducted back in 2001.[33] The number of children born every year with cleft lip and/or palate is 28 000 approximately in India alone, amounting up to a significant number of 78 births per day of babies with some form of cleft.[34]

In a study conducted by Yeshoshua et.al., there was a prevalence of 77% of hypodontia in children with cleft lip and palate which are significantly higher than those patients without cleft lip and palate[17]. This was contradictory with the present study which showed absence of hypodontia in the case group but had one patient in the control group with hypodontia. But statistically, this result was not significant. This could be attributed to the reduced sample size in the current study which could be due to the fact that this was a unicentric study with limited sample population. Bohn, was amongst the first researchers to report the prevalence of congenitally missing teeth in cleft lip and palate, investigated the anomalies of lateral incisors in case of having lip and cleft palate. A total of 63 patients who were 3 to 7 years of age were clinically and radiographically evaluated for anomalies of the lateral incisors and found 52% of the missing lateral incisors in cleft lip and palate group.[35] Olin studied the full mouth intraoral radiograph of 175 cleft lip and palate patients and found the incidence of missing bicuspid was 24% higher in cleft lip and palate patients than the general population [36].

From the analysis of the results from the study, hypodontia was not noticed in children with cleft lip and palate and only one patient was identified to have hypodontia in children without cleft lip and palate. The consensus of the present study was disapproved as the study was limited to certain factors. The advantages of the study were that this was a case-control study with age and gender matched controls to provide better results and high internal validity. The limitations of the study were that this was a unicentric study with geographic limitations, limited sample size and has lower external validity. The genetics factors and other factors like consanguineous marriage, ethnicity, race were not taken into consideration while interpreting the results which could impact on the variables of the present study. The future scope of this study would be to increase the sample size by making it multicentric which could yield better results and higher correlation with varied interpretations.

CONCLUSION :

Within the limitations of the study, children with cleft lip and palate had a lower prevalence of hypodontia when compared to children without cleft lip and palate. However further studies on larger sample size and varied ethnicity can provide better results.

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AUTHOR CONTRIBUTIONS

- Design - Hanshika Ravi, Vignesh Ravindran
- Intellectual content - Vignesh Ravindran
- Data collection - Hanshika Ravi
- Data analysis - Vignesh Ravindran, Dinesh prabu
- Manuscript writing - Hanshika Ravi
- Manuscript editing - Vignesh Ravindran, Dinesh prabu

CONFLICT OF INTEREST

The authors declare that there were no conflicts of interest.

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