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REVIEW ARTICLE

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Dental Caries Status in Children with And Without Cleft Lip: A Case Control Study.

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ABSTRACT

An orofacial cleft is the fourth common congenital malformations in humans. It is caused by the inadequate closure of maxillary processes during 4th week to 12th week of intrauterine life. Dental caries, being a chronic disease, affects both the children and adults. Hence a study was conducted to assess the dental caries status in children with cleft lip and also compare with children without cleft lip. Retrospective data collected from 89,000 case records from June 2019 to March 2020 were taken for the study. Based on the inclusion and exclusion criteria, the present study consisted of 6 children divided into two groups: children with cleft lip and children without cleft lip. In both groups, parameters such as Decayed- Missing - Filled Teeth index score were recorded and tabulated. The data was subjected to Mann-Whitney test using SPSS software. Higher DMFT score was seen in patients without anterior crossbite. Mean DMFT Index for case group (children with cleft lip) was 4, and the mean DMFT Index for control group (children without cleft lip) was 8. Higher caries prevalence was noticed in children without cleft lip when compared to children with cleft lip. The difference was not statistically significant (P value - 0.20). Within the limitations of the study, dental caries status in children with cleft lip is good compared with children without cleft lip.

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KEYWORDS

Clefts, Dental caries, Oral hygiene measures.

INTRODUCTION

Dental caries, being a chronic disease, affects both children and adults which is commonly caused by genetic and environmental factors [1]. It is a multi factorial infectious microbial disease of the teeth which results in localised destruction and destruction of the calcified tissues which often results in cavitation [2]. It is a dental public health problems which involves interference with normal food intake, the avility to speak, the child's self esteem, and their routine activities affecting the overall health status of the children [3].

Cleft lip and palate is a congenital malformation affecting many around the world [4] [5]. Cleft lip are influenced by various factors such as genetics and environmental factors [6]. Cleft lip or palate causes esthetics, psychological and functional problems such as speech [7]. Children with cleft lip and palate

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need an extensive treatment involving a multidisciplinary specialist panel of plastic surgeons, Maxillofacial surgeons, anaesthesiologists, pediatric dentists, orthodontist, speech therapist and others [8]. A child with cleft lip or palate are commonly at high risk to develop dental caries.

Previous study conducted by Zhu et al [9], Al Wahadri et al [10] and Stec-Slonic et al [11] reported that children with without cleft lip/palate have a higher prevalence of dental caries. Other studies [12], [13] found that there was no significant difference in dental caries between the children with and without cleft. Other studies [14],[15] also reported that there is a high prevalence of dental caries in children with and without cleft lip and palate. Ankola et al [16] reported that children with cleft lip were more susceptible to caries than children with cleft palate. However studies conducted among south Indians were limited. Previously we have focused our research on various invitro and invivo studies [17–32] We have currently shifted our focus to this retrospective analysis. So this study was conducted with the aim to assess the dental caries status in children with cleft lip and children without cleft lip.

MATERIALS AND METHODS

This retrospective case-control study was carried out in a hospital based university setting. This study was evaluated and ethically approved by an institutional ethical review committee (ethical approval number: SDC/SIHEC/2020/DIASDATA/0619-0320)".

Retrospective data collected from 89,000 case records from June 2019 to March 2020. Informed consent was obtained from the caretakers or parents or guardian before starting the treatment. Inclusion criteria were children with cleft lip, children aged from 6 months to 18 years, children with at least one or two erupted teeth, children with at least one or two erupted teeth, complete photographic and written records regarding the complete intra-oral examination of the patient. Age and gender matched controls i.e. children without cleft lip, were taken according to the relevant cases obtained from the inclusion criteria. The exclusion criteria were incomplete and censored dental records, children below the age of 6 months and improper photographs.

Total cases acquired for this study were patients 6 which includes 3 children with cleft lip and 3 children without cleft lip (age,gender matched controls). Selected case and control group were examined by three people; one reviewer, one guide and one researcher. Patient's case sheets were reviewed thoroughly. Cross checking of data including digital entry and intraoral photographs was done by an additional reviewer, and as a measure to minimise sampling bias, samples for the group were picked by the simple random sampling method. Digital entry of clinical examination and intraoral photographs were assessed. For both groups, Decayed-Missing-Filled tooth scores were noted by a researcher, entered into Microsoft excel and statistical analyses was performed using Statistical Package for the Social Sciences software. Mann-Whitney test was done to compare the results between the children with cleft lip and children without cleft lip. The difference was statistically significant when the p-value was less than 0.05.

RESULTS AND DISCUSSION

The final study sample size included a total of 6 children with 3 children with cleft lip (case group) and 3 children without cleft lip (control group) [Graph-1]. In this study, the control group is matched based on age and gender as similar to the case group. [Graph-2]. Mean DMFT score for children with cleft lip (case group) was 4 and mean DMFT score for children without cleft lip (control group) was 8. [Graph-3]. Higher caries experience was noticed in children without cleft lip when compared to children with cleft lip [Graph-3]. However this difference was not statistically significant (p-value = 0.20). The Mean DMFT score of children without cleft lip was higher in both males(8) and females(9) when compared to children with cleft lip, which was not statistically significant.(Figure 4) (p=0.08)

The results of the current study showed that lower DMFT scores were noticed in children with cleft. This was similar to the study conducted by Byan et al [7], Neves et al [33] observed that prevalence of dental caries was distributed evenly between the genders. Also study conducted by Gregg et al [34] observed that there is a lower prevalence of dental caries in cleft lip patients. However the results were contradictory to the study conducted by Amandeep Chopra et al reported that cleft lip patients had a mean DMFT score of about 3.8 [35]. Previous study conducted by Lauterstein and Mendelsohn [36] found that there is no significant difference in caries between children with and without cleft. Previous study conducted by Zhu et al [9], Al-Wahadni [10] and Stec- slonic [11] reported that children without cleft lip have higher chances of getting affected by dental caries than children with cleft lip.

Good attitude of parents reflect a good oral health in children and vice versa [37]. Preservation of primary teeth in the dental arch is important to guide the eruption of the permanent teeth in the optimal position. Grossly decayed primary teeth which are extracted before exfoliation causes space in the dental arch which causes malocclusion if space maintainer was not given [38] [39]. Bacteria play a vital role in the initiation and progression of

dental caries which eventually causes pulpal and periapical disease [40]. Saliva plays an important role in maintaining the oral health of an individual [41]. Dental caries, if not treated at the right time, leads to pulpitis which is treated by means of root canal procedure - pulpectomy [42] [43] [44] [45] [46]. Fluoride applications and proper oral hygiene methods has been recommended to prevent the dental caries [47] [48] [49] [50]. [51].

Advantages of this study were that this was a case control study with age and gender matched controls to provide best results with high internal validity, reasonable data, Disadvantage of the study was that this was a unicentric study with geographic limitations, limited sample size and has lower external validity. The dietary factors, feeding and oral hygiene factors were not taken into consideration while interpreting the results. Future scope for this study includes larger sample size which is not confined to a particular geographic area and to assess the DMFT score by clinically examining the cleft lip patients.

CONCLUSION

Within the limitations of the present study, children without cleft lip had higher caries experience when compared to children with cleft lip. However, future studies with larger sample size can provide a deeper insight on this correlation.

AUTHOR CONTRIBUTIONS

- Design - P.Kuzhalvaimozhi, Vignesh Ravindran
- Intellectual content - Vignesh Ravindran
- Data collection - P.Kuzhalvaimozhi
- Data analysis - Vignesh Ravindran, Subhashini.V.C
- Manuscript writing - P.Kuzhalvaimozhi.
- Manuscript editing - Vignesh Ravindran,Subhashini.V.C

CONFLICT OF INTEREST

The authors declare that there were no conflicts of interest.

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ETHICAL CLEARANCE

It is taken from “Saveetha Institute Human Ethical Committee” (Ethical Approval Number-SDC/SIHEC/2020/DIASDATA/0619-0320)

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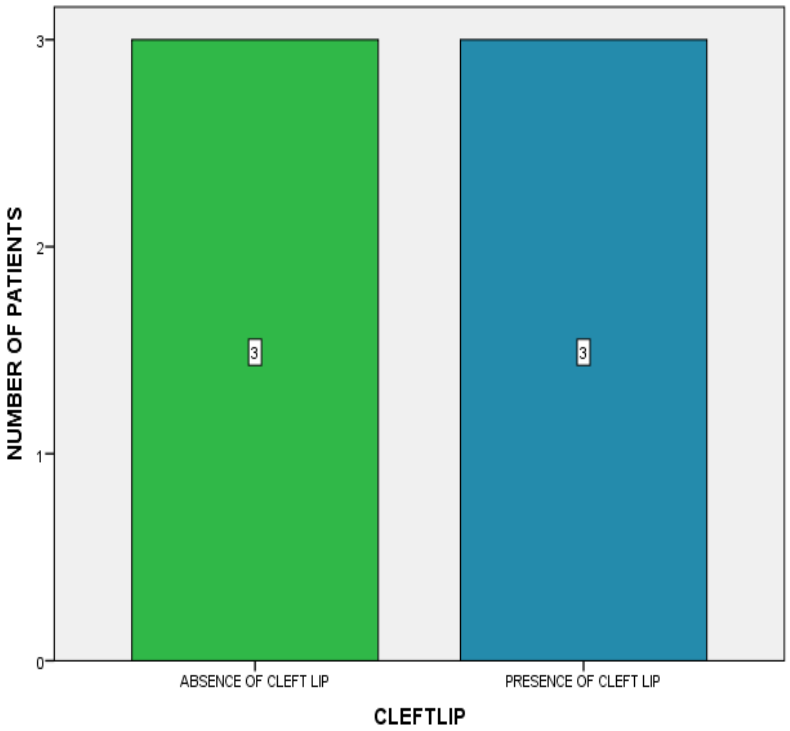
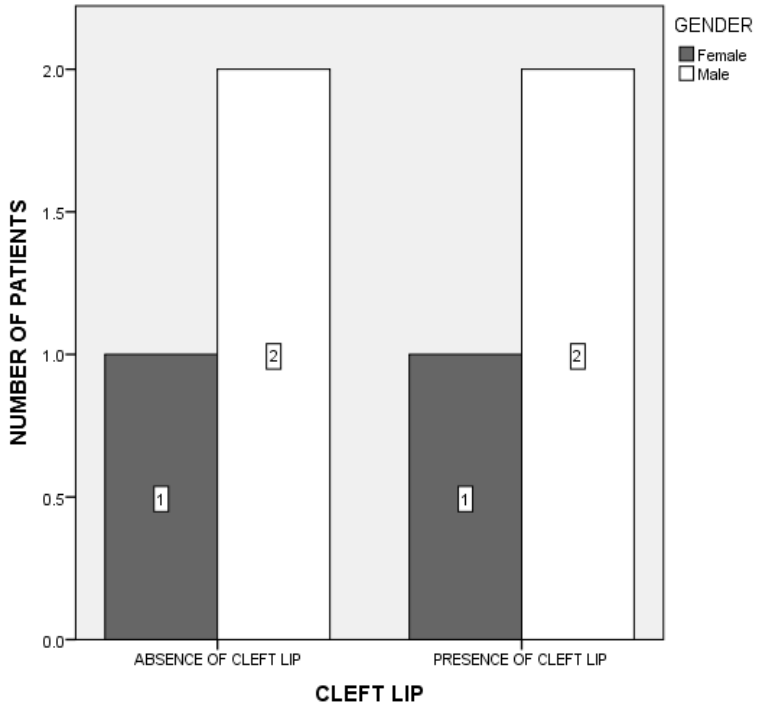
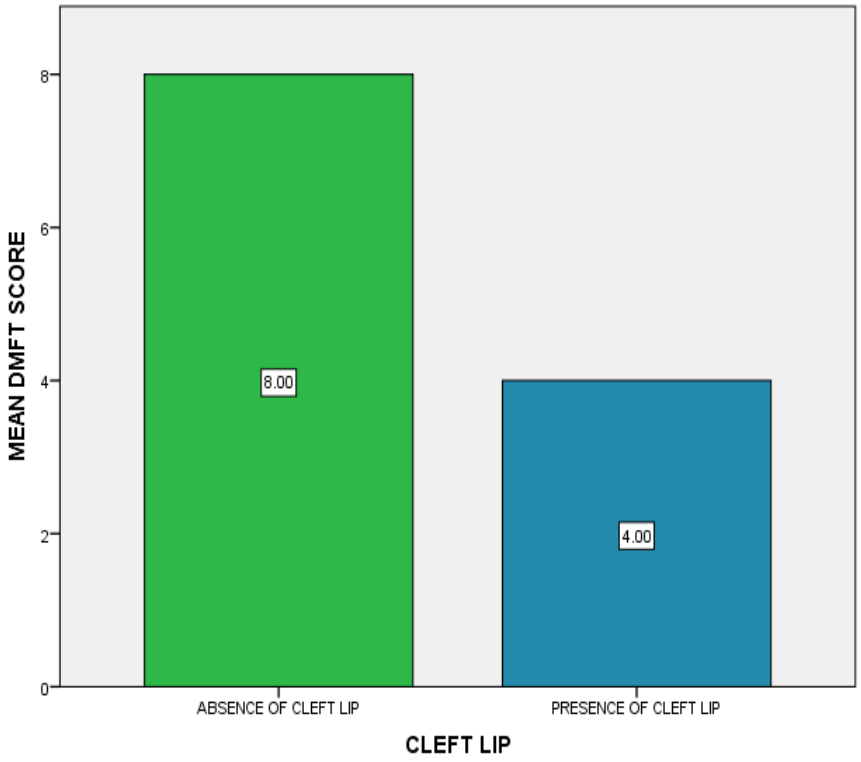


Graph 1: Bar graph represents the number of cases in case (children with cleft lip) and control group (children without cleft lip). (Y-axis represents number of patients; X-axis represents presence or absence of cleft lip) Note the equal distribution of cases in both the groups.



Graph 2: Bar graph represents the gender distribution of cases in case (children with cleft lip) and control group (children without cleft lip). (Y-axis represents the number of patients ; X-axis represents presence or absence of cleft lip; grey represents females ; white represents males) Note the equal distribution of cases in both the groups.



Graph 3: Bar graph represents the Mean DMFT Index in case (children with cleft lip) and control group (children without cleft lip). (Y-axis represents the presence or absence of cleft lip; X-axis represents mean DMFT Index scores; green represents absence of cleft lip; blue represents presence of cleft lip). Mean DMFT index score for children with cleft lip (8) was higher than the mean DMFT index score for children without cleft lip (4).(Mann Whitney U-test; p-value = 0.20 - not significant)

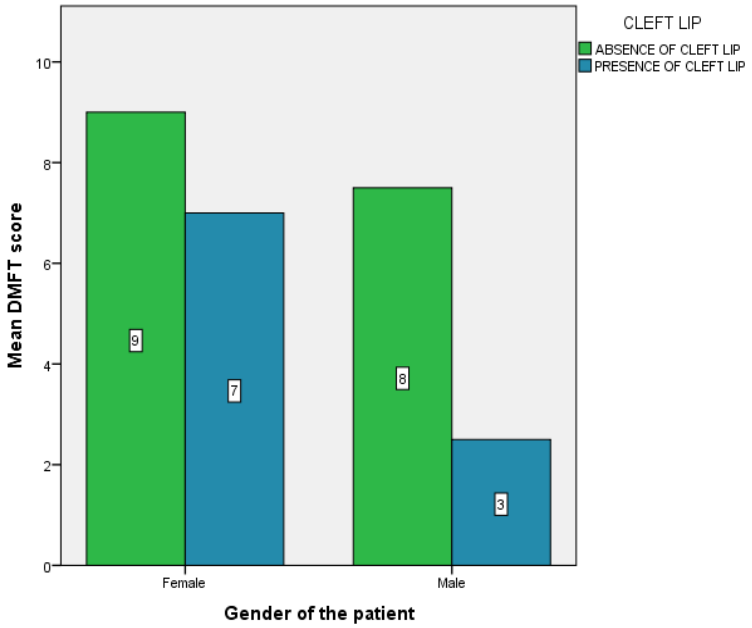


Figure 4: The graph bar depicts the comparison of DMFT index score against the gender of children with cleft lip and children without cleft lip. (X-axis: Gender of the patient; Y-axis: Mean dmft score; Blue: Presence of cleft lip in children; Green: Absence of cleft lip in children). The mean DMFT score of children without cleft lip was higher in both males and females when compared to children with cleft lip. (Mann Whitney test; p=0.08 - not significant)