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DENTAL CARIES EXPERIENCE IN CHILDREN WITH CEREBRAL PALSY

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ABSTRACT

Cerebral palsy is a neurodevelopmental condition which consists of a group of disorders of movement and posture attributed to non progressive disturbances of developing brain. Providing adequate oral care requires adaptation of special dental skills to help families manage the ongoing health issues that may arise. The aim of the study was to evaluate the dental caries experience in children with cerebral palsy and in control patients. An institutional record based study was done to assess the caries experience in cerebral palsy and in control patients who reported to a Private Hospital in Chennai. The study was carried out in a one-year period (June 2019 to April 2020) on a total of 12 patients (6 cases and 6 controls). Data was collected retrospectively from patients who had visited the department of Pedodontics and Preventive dentistry. The data was analysed through SPSS software. The results from the study showed that male patients in both controls and cases have higher caries experience compared to females and also showed to be highest in 6- 10 years of age. The study showed caries experience was highest among patients with cerebral palsy compared to normal patients but was statistically not significant (p value >0.05).

Keywords: Caries; cerebral palsy; children; experience

INTRODUCTION

Cerebral palsy (CP) is a common chronic motor disorder with associated cognitive communicative and seizure disorders .Children with CP have higher risk of dental problems creating significant morbidity that can further affect their well being and negatively impact their quality of life. Cerebral palsy is a common paediatric disorder occurring in approximately 2-2.5 per 1000 live births **[1]**. It is a chronic motor disorder resulting from non- progressive insults to the developing brain **[2, 3]**. Studies have shown that the more severe the neurological insult in children with CP, the higher is the risk of dental disease **[1-4]**.

In general many factors contribute to the development of dental caries including biological, economic, cultural ,environmental and social factors **[15]**. Factors such as food consistency, snacking between meals and associated oromotor dysfunction also have been reported to contribute to the high incidence of caries and periodontal disease found in those with Cerebral Palsy **[16, 17]**.

The high vulnerability to dental caries including dental caries **[8, 9]**. In view of the high rate of CP in the world and the high vulnerability of these children to dental caries level and related risk factors in the children. Eradication of caries is one of the most challenging tasks in this era where consumption of cariogenic diet is a part of every individual's lifestyle **[10, 11]**.

Dental plaque is one of the aetiological factors in causation of dental caries. Effective removal of plaque can reduce the incidence of caries. Various agents for removing plaque has been introduced, of which chewable brush is a recent advance.

There is limited evidence assessing the effectiveness of using chewable brush in children **[12, 13]**.

Pulp therapy in primary teeth has been performed using various instrumentation techniques. However, the conventional instrumentation technique used for root canal preparation in primary teeth is hand instrumentation **[14-16]**.

The purpose of this study is to find the dental caries experience in children having cerebral palsy and in normal children.

MATERIALS AND METHODS

The study was undertaken after ethical approval was obtained from the Institutional Ethical Committee (SDC/SIHEC/2020/DIASDATA/0619-0320). Data was retrospectively collected from the case records of patients who visited the Department of Pediatric and Preventive Dentistry in a Private Hospital of Chennai

from June 2019 to March 2020. Patients who had CP and were below 20 years of age were included in the study bringing the sample size to 12 patients (6 cases and 6 controls). Patients older than 20 years and those with any other disorder, who were under any medication and visited the department outside the time frame were excluded. Cross verification of data for error was done by the presence of additional reviewers and by photographic evaluation. Simple random sampling was done to minimise the sample bias. The data verification was based on age, sex and DMFT scores. DMFT score of 0-3 was considered low; 4-7 moderate and 8-11 high. The results were obtained through SPSS analysis version 23.0. Descriptive study was performed using age, gender and DMFT scores. Statistical analysis was done using Chi-square test to find the association of caries experience among cerebral palsy and normal patients and other variables.

RESULTS

Descriptive study done on association of age and DMFT score in cerebral palsy patients is shown in **Figure 1**. 33.33 % of cases with DMFT scores of 0-3 were present in the age group 6-10 years. 16.67 % cases with DMFT scores of 4-7 were present in 1-5 years, 6-10 years and 16-20 years respectively. 16.67 % cases with DMFT score of 8-11 were present in 6-10 years .Caries experience of cerebral palsy patients showed moderate DMFT score in the age group 6-10 years .(Chi square test = 4.000, p value=1.909). There was no statistically significant association between DMFT and age in cerebral palsy patients.

Association of age and DMFT score in normal patients is shown in **Figure 2**. 16.67 % controls with DMFT score of 0-3 were present in 1-5 years, 11-15 years and 16-20 years respectively . 33.3 % and 16.67 % controls with DMFT scores of 4-7 were present in 6-10 years, 11-15 years respectively. Caries experience of normal patients was low in (Chi-square test = 4.000, p value=1.094). There was no statistically significant association between age and DMFT in normal patients.

Association of DMFT score and gender in cases is shown in **Figure 3**. DMFT score of 0-3 was present in 33.33 % males .DMFT score of 4-7 was present in 16.67 % males and 33.33 % females. DMFT score 8-11 was present in 16.67 % males. Caries experience of males with cerebral palsy was predominantly higher than females. (Chi-square test = 3.000, p value=1.072). There was no statistically significant association between DMFT and gender in cerebral palsy patients.

Association of DMFT score and gender in controls is shown in **Figure 4**. DMFT score of 0-3 was present in 16.67 % males and 33.33 % females. DMFT score of 4-7 was present in 50.0 % males.

Caries experience of males in controls was higher compared to females. Chi-square test = 3.000, p value=1.381). There was no statistically significant association between gender and DMFT in normal patients

DISCUSSION

Children suffering from CP usually have poor oral hygiene when compared to normal children. This is primarily because of their condition and also because children and parents usually do not seek the services of a dental professional **[17, 18]**. In order to ease fear for cerebral palsy patients to visit dentists, clinically, the operator must perform reduced instrumentation time which can considerably can improve patient's cooperation and lessens fatigue of the operator **[19, 20]**.

In a study done by Al Agili DE *et al* the oral hygiene of majority of children is either 55.8 % or 34.6 % **[21, 22]**. Almost all studied children had clinical dental caries with high caries level. Studies have shown that for severe the neurological insult in children with CP, the higher is the risk of dental disease **[23, 24]**. In the present study 33 % carious tooth is highest in age group 6-10 years score index of 3-5 **[Figure 1, Figure 2]**.

In a study done by Rehenna Akhter 35% increase in the risk of caries is in age group 2 to 6 years of age and 70% in 7 to 11 years and no significant sex differences were observed for children aged 1–5 years **[25]**. In the current study, both males and females were equally present in the age 6-10 years. Using statistical analysis the p value is insignificant in both cases and controls. Gender has no correlation with neither age nor total DMFT and dmft scores. Limitations in this study very few sample sizes and not much relevant literature .Hence epidemiological studies among children with CP need to be analysed and studied further. Long-term research needs to be done to find the prevalence and caries experience in children with CP **[26, 27]**.

There is a need for more training and comprehensive education programs regarding the management of children cerebral palsy **[29, 30]**. The reason for a poorer dental status of children with cerebral palsy is due to delay in dental treatment and interacts less with health issues to obtain preventive treatment. Regular dental check up visits can aid dentists and parents in tiny identification of

weak areas to provide education as well as instruction of cerebral palsy in children.

It is the responsibility of parents to pursue health-related necessities of their children. In this regard, the lack of parent's or guardian's attention will have a negative influence on the child's oral status. Investigating dental neglect among children would identify the specific reason for the failure to prevent and treat dental caries. Thereby, it provides opportunity for the government and health care personnel to address the issue at root level.

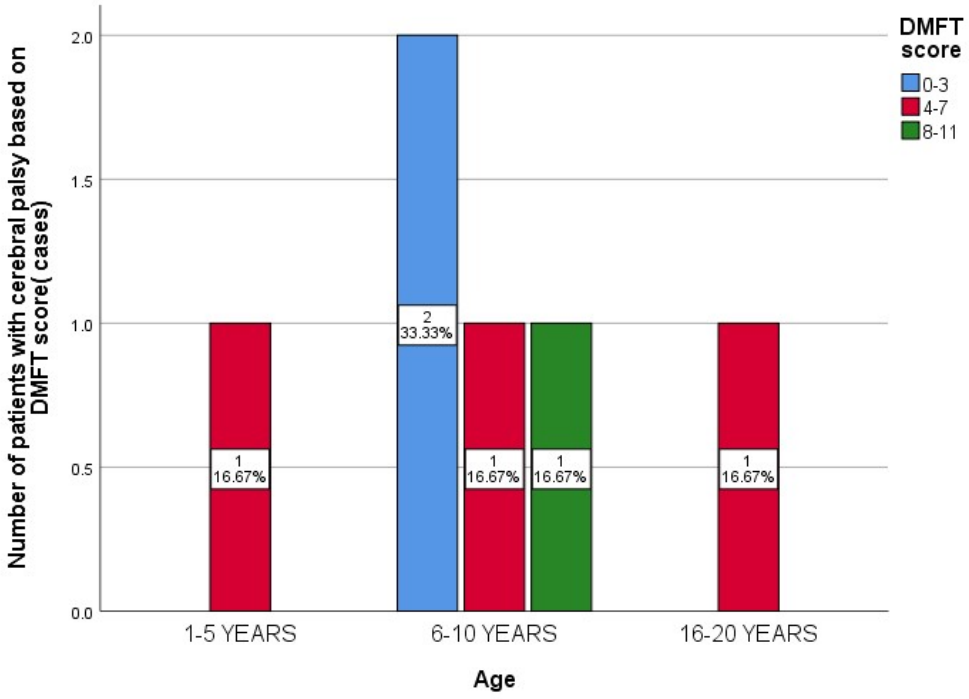

Figure1: Bar chart representing the association of age and DMFT score in cerebral palsy patients The x-axis denotes age and y-axis denotes number of patients (cases) based on DMFT scores. From the graph we infer that DMFT score was highest in age group 6-10 with 33.3% patients having 0-3 DMFT and 16.67% patients each having DMFT 4-7 and 8-11 respectively. Chi-square test = 4.000 ,p value=1.909). There was no statistically significant association age and DMFT in cerebral palsy patients.

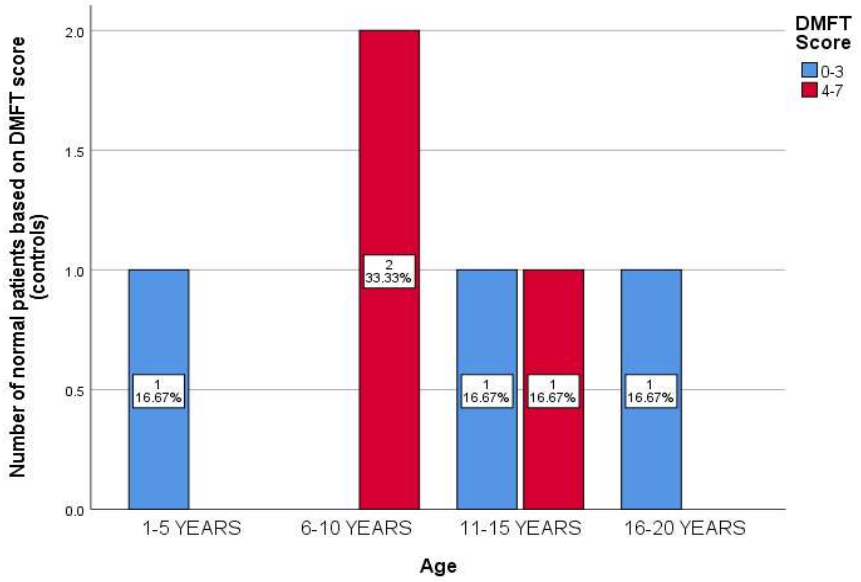

Figure 2: Bar chart representing the association of age and DMFT score in normal patients The x-axis denotes age and y-axis denotes number of patients (controls) based on DMFT score. From the graph we infer that DMFT score of 4-7 (red) was predominant in the age group 6-10 years amongst other age groups. (Chi-square test = 4.000, p value=1.094). There was no significant association between age and DMFT in normal patients

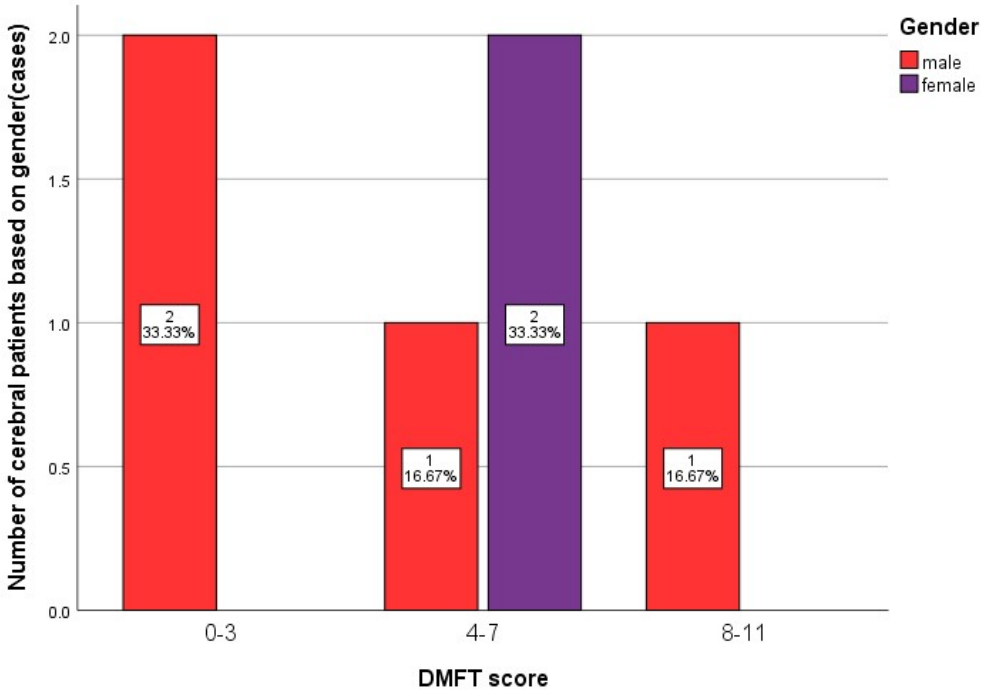

Figure 3: Bar chart representing the association of DMFT score and Gender in patients with cerebral palsy. The x-axis denotes DMFT score and y-axis denotes number of cases with cerebral palsy based on gender distribution. From the graph we infer that males had higher DMFT scores compared to females. (Chi-square test = 3.000, p value=1.072). There was no significant association between DMFT and gender in patients with cerebral palsy

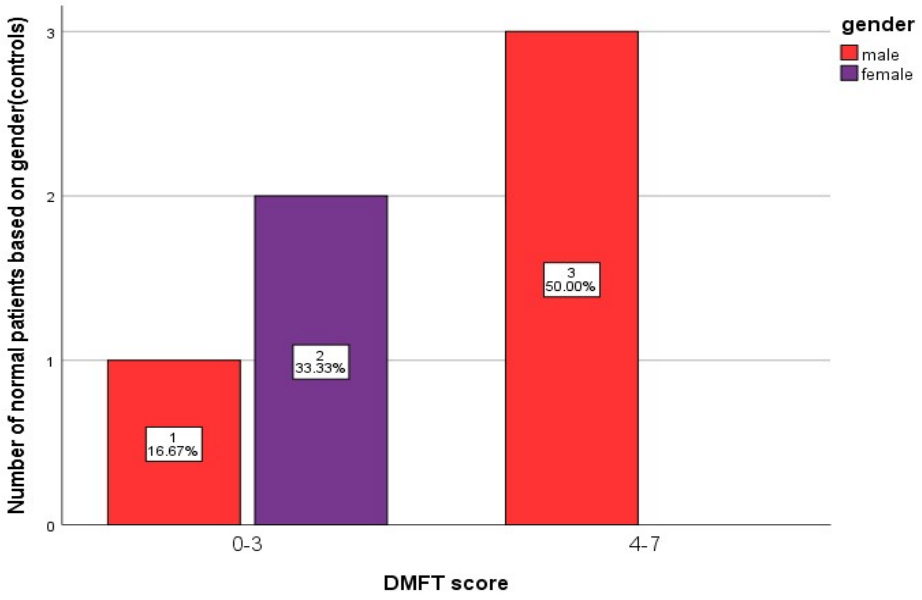

Figure 4: Bar chart representing the association of DMFT score and Gender in control patients. The x-axis denotes DMFT score and y-axis denotes number of control patients based on gender distribution. From the graph we infer that males had higher DMFT scores compared to females . (Chi-square test = 3.000, p value=1.381). There was no significant association between DMFT and genders in controls

CONCLUSION

Within the limitations of the study, caries experience in males were predominantly higher than females in both cases and controls. Risk of caries was highest in 6 - 10 years of age in both cases and controls. Low, moderate and high DMFT scores were present in cerebral palsy patients compared to normal patients. Hence caries experience in children with cerebral palsy was higher compared to normal patients but the difference was statistically not significant.

AUTHORS CONTRIBUTION

First author [Monisha.K.] performed the analysis, and interpretation and wrote the manuscript.

Second author [Dr.Mebin George] contributed to conception, data design, analysis, interpretation and critically revised the manuscript.

Third author [Dr.Aravind Kumar S] participated in the study and revised the manuscript.

All the three authors have discussed the results and contributed to the final manuscript.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

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