

Full Length Research Paper

Oral status of a group of cerebral palsy children

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The purpose of the present study was to evaluate the oral health status (dental caries and dental bacterial plaque), malocclusion, brushing frequency and drooling, in accordance with the type of cerebral palsy in a group of children with cerebral palsy. A total of 25 children with cerebral palsy between the age range of 6.17 to 10.5 years were examined. 25 controls were chosen, that were age and gender matched. The subjects had either spastic or mixed type of vertebral palsy with an average calculated deft and DMFT of 3.0. Class II malocclusion was most prevalent in the cerebral palsied children. The problems of cerebral palsied children must be carefully understood and treated, in order to accomplish desired results in terms of complete dental care of the highest quality.

Key words: Cerebral palsy, oral health, caries, dental plaque.

INTRODUCTION

Cerebral palsy is a term used to describe a group of disorders of movement, muscle tone, or other features that reflect abnormal control over motor function by the central nervous system (Mark, 2003). Children with cerebral palsy are often misinterpreted as mentally disabled due to the presence of primitive postural reactions or reflexes and speech defects (Brett and Scrutton, 1997). A number of studies have been conducted for the etiology, clinical spectrum and distribution of clinical types, but very few articles appear in the literature concerning the dental condition of cerebral palsy patients. According to the Swedish classification system, cerebral palsy can be classified as spastic, dyskinetic, ataxic and mixed type (Hagberg et al., 1972).

According to a study done in India by Singhi et al. (2002), spastic quadriplegia constitutes the predominant group (61%), followed by spastic diplegia (22%). Associated problems are present in a majority (75%) of cases; of which mental retardation is the commonest (72.5%). The dental problems associated with suffering from cerebral palsy include carious teeth, periodontitis, malocclusion, bruxism and drooling (Nallegowda et al.,

2005; Bhavsar and Damle, 1996; Tahmassebi and Curzon, 2003; Strodel, 1987). The aim of the present study was to evaluate the type of cerebral palsy, the oral health status (dental caries and plaque), malocclusion, brushing frequency and drooling in children with cerebral palsy.

METHODOLOGY

Twenty five children between the age range of 6.17 and 10.5 years suffering from cerebral palsy attending the out patient clinic of the Department of Pedodontics and Preventive Dentistry, Christian Dental College, Ludhiana, India were included in the study. A proforma was filled after taking complete history and evaluation. They were classified as spastic, dyskinetic, ataxic or mixed type of cerebral palsied child according to Swedish classification system (Hagberg et al., 1972). Oral hygiene scoring was carried out according to Modified Oral Hygiene Plaque Index (Loe, 1967) (Table 5). This plaque index describes the thickness plaque in the cervical area of teeth. It is one of the oldest and still frequently used plaque indexes. The oral health status was evaluated using World Health Organization (WHO) criteria 1997 for dental caries using the DMFT/deft index. The DMFT/deft index is one of the simplest and most commonly used indices in epidemiologic surveys of dental caries. It quantifies dental health status based on the number of carious, missing and filled teeth.

The malocclusion was classified as Class I, Class II or Class III type as given by Angle. This classification is based on the relationship of the mesiobuccal cusp of the maxillary first molar and the buccal groove of the mandibular first molar. If this molar

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Table 1. Topographic distribution of cases.

Type of cases	Number of cases
Spastic	15
Mixed type	10

Table 2. Results of primary dentition deft.

Variable	D	E	F
Cases	29	5	8
Controls	15	4	12

Table 3. Results of permanent dentition DMFT.

Variable	D	M	F
Cases	24	0	9
Controls	16	0	12

Table 4. Distribution of cases with malocclusion.

Type	Number of cases	Number of controls
Class I malocclusion	8	19
Class II malocclusion	17	5
Class III malocclusion	0	1
Posterior cross bite	4	0

relationship exists, then the teeth can align into normal occlusion.

RESULTS

The children included in the study were within the age range of 6.17 and 10.5 years with an average age of 8 years and 3 months. Out of the 25 subjects, 15 had spastic and 10 had mixed type of cerebral palsy (Table 1). The deft and DMFT were recorded separately for each patient, as all the patients were in the mixed dentition stage, (Tables 2 and 3). The average deft and DMFT calculated was 1.68 and 1.32 respectively. The children with spastic cerebral palsy demonstrated a statistically significant Class II malocclusion.

Out of 17 spastic children, five of them had Class I malocclusion while 12 had Class II malocclusion. Out of the eight children with mixed type of cerebral palsy, three had Class I malocclusion while five had Class II malocclusion. Posterior cross bite was seen in four

Table 5. Oral hygiene score.

	Number of cases	Number of controls
Poor	10	5
Moderate	8	9
Good	7	11

Table 6. Cases with drooling.

Drooling	Present	Absent
Number of cases	4	21
Number of controls	0	25

cases. All the four children demonstrated unilateral posterior cross bite (Table 4).

There were ten children with poor, eight with moderate and only seven children with good oral hygiene. All children in the study used tooth brush and toothpaste as the means of oral hygiene. Out of the 25 children, only four children brushed twice daily. As for ability to swish and rinse, only five children could rinse properly. Drooling was observed in only four cases (Table 6).

DISCUSSION

The purpose of this study was to provide information concerning the dental status of cerebral palsy children. Observations of cerebral palsied children disclosed a wide range in extent of carious involvement. While there were many children with extensive involvement because of severely decayed teeth, there were others who appeared to have dentitions free from decay. The prevalence of deft/ DMFT in cerebral palsy children, as found in the present study is high. The average deft score was 1.68 and DMFT was 1.32. Bhavsar and Damle (1996) in a study for dental caries and oral hygiene amongst 12 to 14 year old handicapped children of Bombay found that, prevalence and severity of dental caries was highest in cerebral palsy group and lowest in the blind group. In a similar study by Nallegowda et al. (2005) prevalence of deft/ DMFT was assessed to be 2.2. The prevalence of high deft/DMFT seen in cerebral palsied children was attributed to the lack of oral hygiene maintenance. Guare and Campioni (2003) reported that, children with cerebral palsy had greater prevalence of dental caries in the primary dentition than normal children. On the contrary, one study by DU RY et al. (2010) showed that, children with and without cerebral palsy had similar caries experiences ($P > 0.05$).

Several studies have been conducted to observe the prevalence of malocclusion in cerebral palsy children but with contrasting results. Rosenbaum et al. (1966) judged the total prevalence of malocclusion among cerebra

palsy children is not found in greater frequency than normal children. However, Lyons (1951) found a higher prevalence in cerebral palsied children. According to Rosenstein (1978) malocclusion is present more frequently in children with cerebral palsy than in the normal population and the prevalence of Class II malocclusion is also markedly greater in cerebral palsied children. In our study, majority of the children (60%) had Class II malocclusion. Strodel (1987) in 1987 found that, spastic cerebral palsied children have a greater tendency towards Class II malocclusion. In our study, we found similar results, with 70.58% spastic cerebral palsied children having Class II malocclusion. The main risk factors associated with the severity of malocclusion in cerebral palsy patients have been determined to be mouth breathing, lip incompetence, and long face (Miamoto et al., 2010). When oral hygiene was assessed, poor oral hygiene was a predominant finding in our study. Results showed that only four children (16%) brushed twice daily. Adequate daily oral cleansing is important and heavily dependent on effective tooth brushing. This is more so in children with cerebral palsy who show impairment of natural cleansing by the oral musculature. Poor oral hygiene in majority (40%) of the patients was attributed to the inability of these children to perform basic home care procedures of oral hygiene. It was observed by Guare and Campioni (2004) that, the mean values for the debris index, OHI-S, and gingival index were higher in the children with CP than in the control group.

The results of a study by Rodrigues dos Santos et al. (2003), showed a significantly higher DMFS index and plaque index for cerebral palsied children with permanent dentition of both sexes when compared to normal children. Significantly higher percentages of malocclusion were also observed in these children. It is estimated that a high number of cerebral palsied children have a drooling problem significant enough to interfere with daily social and practical functions. Though the etiology of drooling is not fully understood, Tahmassebi (2003) and Rosenstein (1978) have suggested collection of saliva in mouth, as a possible reason for the drooling seen in cerebral palsy children. This is due to inability to swallow properly due to swallowing defect. Hegde et al. (2008) reported that, drooling may not predispose the individual to dental caries, individuals with drooling have a poorer oral hygiene score than those without. Though our study was not designed to study traumatic injuries to the teeth and self inflicted injuries in children with cerebral palsy, only two cases in our study had a fractured maxillary incisor.

According to a study by Holan et al. (2005), the prevalence of dental injuries in a group of individuals with cerebral palsy was much higher than that of healthy population, despite the fact that children with cerebral palsy do not take part in violent sport activities as normal children do. Managing a cerebral palsied child poses a

big challenge for the pediatric dentist because of uncontrolled movements, the child cannot open the mouth for long time, so that dental procedure can be carried out. Hence, use of a mouth prop is advised. Use of an acrylic mouth prop in the form of thick ring has also been suggested. It can be worn on the finger of mirror holding hand. Cerebral palsied children seek friendliness as much as other children, they respond favorably to encouragement, warmth and personal interest and try to reciprocate and cooperate. These attitudes on the part of dentist become part of the pedodontic approach to the child and help build the desired approach to the problems of cerebral palsied children should be understood and solved, in order to attain a good report in the dental office and to accomplish desired results in terms of complete dental care of the highest quality.

Conclusion

Children affected with cerebral palsy show several oral findings. Earlier preventive measures for cerebral palsied patients are required because they are a high-risk group for dental caries. Comprehensive assessment and early management of these problems are emphasized, which can minimize the extent of disabilities. An obvious lack of oral hygiene measures used by these children indicates the need for intensive home care procedures and regular visits to pediatric dentists for preventive dentistry procedures.

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