

## **Oral Health Status in Indian Children with Cerebral Palsy - A Pilot Study**

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### **Abstract**

**Cerebral palsy is a major severe childhood disability and its prevalence is increasing, particularly among premature low birth weight newborns. Less attention is paid to dental health in these children. This study aimed to investigate various dental problems such as dental caries, plaque index, malocclusion and drooling in a group of 53 Indian cerebral palsy children. The results were compared with a control group of 53 age and sex matched normal children. Non-parametric statistical tests were used, with the level of significance set at  $p < 0.05$ . The results showed a significant difference between cases and controls for caries. No significant difference was noted for malocclusion. One of the significant finding was that the children affected with drooling were not affected with caries teeth. Conclusion- Good oral hygiene, accompanied by early and regular dental examination and treatment will enhance good dental health in cerebral palsy children.**

### **Introduction**

Cerebral palsy is defined as a non- progressive disorder that manifests as abnormality of motion and posture and results from a central nervous system injury sustained in the early period of brain development, usually defined as first 3-5 years of life.<sup>1</sup> Advances in perinatology have led to increasing survival of preterms and a change in the distribution of the clinical types of cerebral palsy.<sup>2,3</sup> A number of studies have been done for the clinical spectrum or associated risk factors in cerebral palsy children but very less attention is paid to the dental health in these children. The cerebral palsied children face a number of dental problems like other children. These problems include caries teeth, periodontitis, malocclusion, bruxism and tooth decay. The difficulty in swallowing in these patients leads to drooling. Inability to perform oral hygiene procedures contributes

to the increased incidence of dental diseases in these patients. Furthermore, seizures are common in cerebral palsy patients and anti-epileptic drugs especially phenytoin sodium can cause gingival overgrowth which complicates oral hygiene procedures, making it more difficult to control dental plaque.

### **Aims and Objectives**

The aims and objectives of the present study are to evaluate the oral health status in Indian children with cerebral palsy using WHO criteria; to evaluate curative and preventive methods to fight dental caries; and to know the role of excessive salivation on oral health status in cerebral palsy children.

### **Material and Methods**

53 cerebral palsy children attending the OPD of PMR, AIIMS were included in the study. After clinical assessment, a clinical psychologist did IQ assessment. Oral examination was done by a Pedodontist using DMFT

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criteria as per WHO Oral Health Assessment Form (1997). Oral Hygiene Plaque Index (modified Loe and Silness) was used for evaluating plaques. Assessment for malocclusion was done clinically. Excessive salivation was also recorded. The patients were compared with equal number of age and sex matched controls attending the OPD of Dental Surgery.

**Results**

The maximum cases were in the age group of 6-8 years. Quadriplegics and diplegics constituted maximum number of cases (Table 1). On IQ assessment, it was seen that children with mild mental retardation were maximum followed by moderate mental retardation (Table 2). Significant difference was noted between cases and controls for caries (Table 3 and Table 4, Fig 1, 2 and 3). In cases average DMFT was 2.22 and controls it was 1.52. (D stand for decayed tooth, M for missing, F for filled. DMFT stand for permanent tooth, dmft stands for primary tooth or milk tooth). There were 11 patients with malocclusion (Table-5, Fig-4), highest with bimaxillary prognathism. For plaque index and malocclusion no significant difference was observed between cases and controls. Drooling was observed in 13 children (Fig 5). An important finding was that none of these children were affected with caries teeth. The treatment required by most of the children was restoration of the teeth. Other treatment advised was plaque control programme, brushing techniques, modifications of tooth brushes (fruit or ball shaped handles using foam or POP), anti microbial agents, use of tooth paste containing fluoride, caries filling, diet control along with spasticity management and proper postural advice.

**Table-1: Topographical distribution of cases.**

Type of cases	Number of cases
Quadriplegic	20
Diplegic	26
Hemiplegic	3
Monoplegic	1
Athetoid	3

**Table-2: Distribution of cases on IQ assessment.**

Type of cases	Number of cases
Average	7
Borderline	4
Mild	15
Moderate	13
Severe	9
Profound	5

**Table: 3: Results of primary dentition deft: (cerebral palsy n=113, Controls n=68):**

Variable	d	e	f	t
Cases	98	15	2	0
Controls	59	7	0	0

**Table-4: Results of permanent dentition DMFT (cerebral palsy n=5, Controls n=13):**

Variable	D	E	F
Cases	5	0	0
Controls	13	0	0

Total DMFT+deft: Cerebral palsy-118, Controls- 81  
Average DMFT +deft: CP-2.22, Control – 1.52(p<0.01)

**Table-5: Distribution of cases with malocclusion**

Type	Cases	Controls
Crowding	3	2
Maxillary prognathism	2	2
Bimaxillary prognathism	4	0
Malocclusion-class II	2	4
Normal occlusion	42	44

**Table-6: Oral hygiene scores**

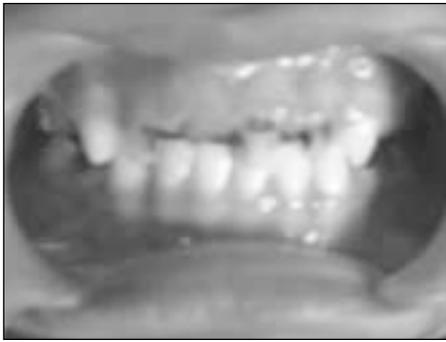
	Cerebral palsy	Controls
Poor	0	0
Moderate	34	21
Good	19	34



**Fig. 1 : Caries teeth**



**Fig. 2 : Rampant dental caries with missing teeth**



*Fig. 3 : Nursing bottle caries*



*Fig. 4 : Malocclusion*



*Fig. 5 : Drooling of saliva*

## Discussion

A number of studies related to dental disease in cerebral palsy have been done in the west but till now we have not come across any study that has been done to evaluate dental problems in cerebral palsy children in India. The purpose of this study was to assess dental problems in Indian children with cerebral palsy. We found that there was significant difference between cases and controls for caries. In contrast, Pope JE et al found a similar incidence of caries between cerebral palsy children and controls, but the study children had more extracted and unrestored teeth, and fewer and poorer quality restorations than control children.<sup>4</sup> Bhavsar JP et al in a study for dental caries and oral hygiene amongst 12-14 years 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.<sup>5</sup> Malocclusion is the attrition of teeth through grinding. For malocclusion no significant difference was noted.

The misalignment of teeth in cerebral palsy may be due to abnormal alignment of the tongue, lips and cheeks. In a study of Greek children with disabilities the highest rate of malocclusion was observed in children with cerebral palsy.<sup>6</sup> Another study of oral conditions on cerebral palsy children showed a significantly higher DMFS index for cerebral palsy children with permanent dentition when compared to normal children, also a significantly higher plaque index and higher percentage of malocclusion was observed.<sup>7</sup> Drooling is another common problem in these children. It is related to abnormality with swallowing and difficulties in moving saliva to the back of the throat. This is due to the misalignment of teeth and the lack of control of the muscles within the mouth. It can also be made worse by a lack of head control, poor posture, lack of sensation around the mouth, impaired concentration or an obstruction within the nasal cavity. A study done by Tahmassebi et al showed that drooling in cerebral palsy children is not due to hypersalivation but rather due to swallowing defect.<sup>8</sup> Management includes drugs like transdermal scopolamine to dry up salivary secretions. Latest development in the management of drooling is USG guided intraglandular injection of botulinum toxin type A into the salivary glands.<sup>9</sup> Surgery can be done in severe cases of drooling by parotid duct ligation and submandibular duct diversion.<sup>10</sup> But it has been shown that caries prevalence increases after surgery.<sup>11</sup>

Education of patients, parents and health care providers is still a big challenge. Various modifications of toothbrush handles, oral anti-microbial agents and topical and systemic fluorides can enhance home care results. The active participation of parent and patient will go a long way towards achieving and maintaining oral health.

## Conclusion

Most dental diseases can be prevented. Successful application of sound preventive measures and regular follow up tends to lessen time of treatment for each patient. Good oral hygiene, accompanied by early and regular dental examination and treatment will enhance good dental health in cerebral palsy children.

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