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Original Research

Oral Manifestation in Mentally Challenged Children

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Abstract:

Background: In general, mentally challenged children have higher rates poor oral hygiene, gingivitis and periodontitis than the general population. An investigation was undertaken to assess the oral manifestations of mentally challenged children in Chennai, India.

Materials and Methods: The study group consisted of 150 children (70 Down syndrome patients and 80 cerebral palsy patients). Of which, 93 patients were males and 57 were females.

Results: Speech difficulty hindered the communication between the patient and the dentist. Mastication and swallowing difficulties were also present in few children. Profuse salivation was a cause for drooling of saliva down the cheeks, which was a constant finding in cerebral palsy children. The oral hygiene statuses of the patient were significantly poor. The prevalence of periodontitis was 35.7% in Down syndrome and 55.0% in cerebral palsy patients. Whereas, the prevalence of gingivitis was found to be 92.9% and 61.3% respectively. The prevalence of fractured maxillary anterior teeth was found to be more evident in cerebral palsy patients (62.9%) when compared to Down syndrome patients (0.0%). An increase in age shows an increase in the decayed-missing-filled teeth which is statistically significant.

Conclusion: The prominent findings like flat nasal bridge (94.3%), hypertelorism (92.9%), high arched palate (78.6%) and fissured tongue (78.6%) in our study, suggest that they could be used as a reliable clinical markers to diagnose Down syndrome condition.

Key Words: Cerebral palsy, Down syndrome, gingivitis, oral hygiene, periodontitis

Introduction

Global prevalence of mentally challenged persons ranges from 9 to 19%.[1] In the society many mentally challenged persons find it hard to survive as the nutritional status is low, and services are inadequate. Mentally challenged condition is one among the main causes of dependency and deprivation in most developing countries. Mentally challenged people tend to have been more or less excluded from the normal life of the community as a result of physical, social or psychological barriers erected, or at least accepted, by society. They have little access to services or to decision making that relates to their future and have no part in community production and consumption.

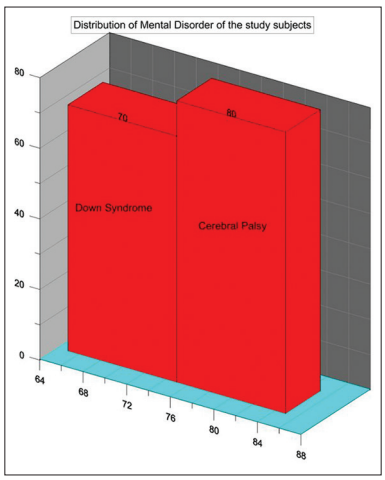
When these patients go for dental consultation, it is important that he understands the patient's general conditions, etiology, natural history, complications, and prognosis. There is a general agreement that the population with mentally challenged children has higher rates than the general population, for poor oral hygiene, gingivitis and periodontitis.[2] Moderate or severe gingivitis has been found almost universally, with degree and extent increasing with age and degree of mental retardation, especially for those individuals with Down's syndrome. Local factors such as the macroglossia, malocclusion, tooth morphology, lack of normal masticatory function and bruxism have been suggested as contributing factors.[3]

The present study was undertaken to assess the intra-oral soft and hard tissue findings and oral health status of the children with Down syndrome, including other anomalies and to assess the oral manifestations and oral health status of the children with cerebral palsy.

Materials and Methods

An epidemiological survey was conducted to assess the oral manifestations among 6-15 years old mentally challenged children, attending special schools for the mentally challenged in Chennai, India. The study group consisted of 150 children. Among them, 70 were Down syndrome patients and 80 were cerebral palsy patients (Graph 1). 93 of these examined were males and 57 were females. A schedule for data collection was prepared. The average number of 10-20 school children was examined per day. The study was approved by the Institutional Ethical Committee.

A master file was created for the purpose of data analysis. Descriptive statistics that included mean, standard deviation



Graph 1: Distribution of the mental disorder of the study group.

and percentages were calculated for each of the categories. Chi-square test was used to determine whether differences were present in the oral manifestations between Down syndrome and cerebral palsy patients. Significance for all statistical tests was predetermined at a probability value of 0.05 or less (data were analyzed using the statistical package SPSS 17.0 and Minitab software 16.0.

Results

In Down syndrome, our findings showed hypertelorism in 65 cases with incidence of 92.9%, whereas in cerebral palsy hypertelorism in none of the cases with an incidence of 0.0%. Comparison between these two groups was found to be statistically significant. Flat nasal bridge was noted in 66 Down syndrome cases (94.3%), whereas in cerebral palsy none of the cases had flat nasal bridge. Mouth breathing in 42 cases with Down syndrome (60.0%) and 48 cases with cerebral palsy (60.0%). Comparison between these two groups was not significant.

The classical intra-oral finding was macroglossia in 52 cases in Down syndrome patients (83.6%) and no cases in cerebral palsy. Fissured tongue was seen in 55 cases in Down syndrome (78.6%) patients and 14 cases (17.5%) in cerebral palsy patients. The comparison between these two groups was statistically significant. Marginal gingivitis was found in 65 cases with Down syndrome (92.9%) and 49 cases with cerebral palsy (61.3%). The comparison between these two groups was statistically significant. Periodontitis was noted with 25 cases with Down syndrome (11.5%) and 44 cases in cerebral palsy (55.0%) There was no case of acute necrotizing ulcerative gingivitis seen in our study group. The OH-index was performed on each patient and scored. According to the scores obtained, they were grouped as poor, moderate, and good. The comparison between these two groups was not significant.

High arched palate was seen in 55 cases with Down syndrome (78.6%) and 16 cases with cerebral palsy. The comparison between these two groups was statistically significant. Hypodontia was the most common finding seen in 29 patients with Down syndrome (41.4%) and 9 cases with cerebral palsy (11.3%), showed high significance. Microdontia was seen in 44 patients (62.9%) with Down syndrome and 17 cases (21.3%) with cerebral palsy, which was statistically highly significant. Fractured maxillary anterior teeth were the most common finding seen in 50 patients with cerebral palsy (62.5%) and in none of the cases with down syndrome, which was statistically highly significant.

Dental caries was assessed using the dentition status and treatment needs. One down syndrome patient (1.4%) and four cerebral palsy patients (5.0%) had decayed-missing-filled teeth (DMFT) score of 0. One Down syndrome patient (1.4%) and three cerebral palsy patients (3.8%) had DMFT score of 1. Three Down syndrome patients (4.3%) and 15 cerebral palsy patients (18.8%) had DMFT score of 2. Five Down syndrome patients (7.1%) and three cerebral patients (3.8%) had DMFT score of 3. 11 Down syndrome patients (15.7%) and 17 cerebral palsy patients (21.3%) had DMFT score of 4. 17 Down syndrome patients (24.3%) and 22 cerebral palsy patients (27.5%) had DMFT of 5. 32 Down syndrome patients (45.7%) and 16 cerebral palsy patients (20.0%) had DMFT score of 6 (Table 1). The comparison between the two age groups in Down syndrome and cerebral palsy patients was statistically highly significant. Mal alignment was seen 49 cases (70.0%) with Down syndrome and 47 cases with cerebral palsy (58.8%). Anterior open bite was seen in 16 cases with Down syndrome (22.9%) and 18 cases with cerebral palsy (22.5%). The difference was not significant. Anterior cross bite was seen in 11 cases with down syndrome (12.5%) and 13 cases with cerebral palsy (16.3%) and posterior cross bite was noted in 14 cases (20.0%) with down syndrome and 13 cases (16.3%) with cerebral palsy.

Discussion

Despite the evidence for variations of many characters, the literature on Down syndrome has exaggerated the homogeneity of this population. There has been enduring belief that people with Down syndrome reach a plateau in adolescence, beyond which further developmental change is not possible.[4] The number of community-dwelling Down syndrome children is increasing in United States due to advances in medical science, improved educational systems, and greater social acceptance of people with disabilities in the community.[5] However, the scenario in India is not clear, which may be due to lack of extensive surveys conducted on these kinds of children. In India, there are not sufficient residential institutions for these kinds of children, which results in most of the Down syndrome children living in their home along with other siblings.[6]

Table 1: DMFT scores in the patients in different age groups.

Group	Age group		Total
	6-9 years	10-14 years	
Down syndrome			
DMFT			
0			
Count	1	0	1
Percentage of total	1.4	0.0	1.4
1			
Count	1	0	1
Percentage of total	1.4	0.0	1.4
2			
Count	2	1	3
Percentage of total	2.9	1.4	4.3
3			
Count	3	2	5
Percentage of total	4.3	2.9	7.1
4			
Count	7	4	11
Percentage of total	10.0	5.7	15.7
5			
Count	0	17	17
Percentage of total	0.0	24.3	24.3
6			
Count	6	26	32
Percentage of total	8.6	37.1	45.7
Total			
Count	20	50	70
Percentage of total	28.6	71.4	100.0
Cerebral palsy			
DMFT			
0			
Count	3	1	4
Percentage of total	3.8	1.3	5.0
1			
Count	1	2	3
Percentage of total	1.3	2.5	3.8
2			
Count	2	13	15
Percentage of total	2.5	16.3	18.8
3			
Count	3	0	3
Percentage of total	3.8	0.0	3.8
4			
Count	4	13	17
Percentage of total	5.0	16.3	21.3
5			
Count	4	18	22
Percentage of total	5.0	22.5	27.5
6			
Count	6	10	16
Percentage of total	7.5	12.5	20.0
Total			
Count	23	57	80
Percentage of total	28.8	71.3	100.0

DMFT: Decayed-missing-filled teeth

The cause of cerebral palsy is poorly understood but is most likely caused by a variety of factors. Cerebral palsy can be associated with prenatal, perinatal, or postnatal events. Prenatal factors cause 70-80% of cases of cerebral palsy.[7]

In our study, we found palatal variation in 78.6% of Down syndrome patients, which is higher when compared to the study by Gullikson in which he found an abnormal palate in 67.8% cases. This difference could be due to a large number of cases observed in our study. It can be suggested that there may not be an actual difference in measured height of the palatal vault, but merely different palatal form for those Down syndrome patients judged to have a high vault. Jairamdas *et al.*, described that Down syndrome patients had a stair or V-shaped palate with high arch, which according to them was caused by deficient development of the midface, and it affected the length, height, depth of palate and usually the width.[8] Further studies are certainly indicated in regard to palatine form and vault height.[2] Dellavia *et al.* reported no significant difference in the measured vault height in his Down syndrome group of patients; however they did report narrower and shorter palates.[9]

Cohen and Winer (1965) in their analysis of 94 down syndrome cases 48.7% had abnormal tongues, 11.3% were enlarged, and 37.4% were fissured.[10] They also reported that fissured tongue in Down syndrome patients was a constant finding with an incidence of 50% and higher. Occasionally macroglossia and microglossia were observed, but in most cases the tongue was of normal size. In the study higher incidence of fissured tongue (55 cases) and macroglossia (52 cases) was observed. This observation is in agreement with Cohen. Gullikson reported large tongue in about 61% of cases, which is quite similar to that of our study. The difference could be due to increase the number of cases observed in our study.[11]

Undeutsch *et al.*, postulated that inadequate lymphatic drainage was a cause for macroglossia in Down syndrome patients. His study also pointed out that the dorsal surface changes of the tongue characterized by drying and chapping occurred due to mouth breathing. Protrusion of the tongue led to speech and articulation problems. Similar findings were seen in our study. Orthodontic referral and speech therapy is also recommended for such patients.[12]

In this study, drooling of saliva was present in 70.0% of the individuals with cerebral palsy, which is the same as reported by Nallegowda *et al.*[13] Drooling is another common problem in these children. It was related to an abnormality with swallowing. This was due to the mal-alignment of teeth and lack of control of the muscles within the mouth. It could also be made worse by a lack of head control, poor posture, and lack of sensation around the mouth, impaired concentration or an obstruction within the nasal cavity. Tahmassebi and Curzon. showed that drooling of saliva in children with cerebral palsy is not due to hypersalivation but rather due to swallowing defect.[14]

About 35% to 55% of Down syndrome patients present features of microdontia in both the primary and secondary dentition. Clinical crowns are frequently conical, shorter and smaller than normal. Spitzer (1963) described them as "stunted with short, small crowns and roots." In our study we found 62.9% patients with Down syndrome having microdontia and most of them involving maxillary lateral incisor, which appear similar to the description of Spitzer that is short, conical crowns (peg laterals), leading to spacing. Kissling (1966) examined the tooth diameters and found that all the teeth except first molars and lower incisors were reduced in size but that root formation was always complete.

In our analysis of 70 cases we found, missing teeth in 29 cases accounting for about (41.4%) and most teeth being third molars followed by permanent maxillary lateral incisors similar to the findings of Gullikson.[11] Since their study group consisted of only 28 cases, which may account for a high number of missing teeth.

Orner's study contrasted the dental caries experience of Down syndrome patients with that of their siblings. He found that the Down syndrome patients experienced <1/3rd caries than their unaffected siblings. Shapiro *et al*. found that Down syndrome adults who were caries free had significantly lower streptococcus mutants counts compared with the patients with dental caries. He mentioned that, there are several factors responsible for low prevalence of dental caries. They are: Delayed eruption, reduced time of exposure to cariogenic environment, congenitally missing teeth, higher salivary pH and bicarbonate levels (providing better buffering action), microdontia, spaced dentition and shallow fissures of teeth, all contribute to lower risk of dental caries.[15]

In this study, prevalence of periodontal disease in Down syndrome patients was found to be 35.7% and the prevalence of periodontitis in cerebral palsy patients was found to be 55.0%. This finding is concurrent with the finding of Brown and Cunningham (1961) where they found the prevalence of periodontal disease to be 55.0%.[16] A similar study by Cohen and Winer (1965) on 100 patients found that most significant finding in their study was the prevalence of periodontal disease condition being observed in 96 of 100 cases examined.[10] It was usually characterized by chronic marginal gingivitis, gingival enlargement, materia alba, stain, calculus, gingival recession, tooth mobility and pocket formation. Only four patients were free of gingival disease, three of these were under 3 years of age, 4th was an 18 year old girl whose roentgenograms showed both vertical and horizontal alveolar bone loss in all four quadrants of the mouth.

In this study of 70 down syndrome cases, 65 patients had periodontal diseases which consisted mainly in the form of chronic marginal gingivitis, followed by gingival enlargement, materia alba, calculus, stains, pocket, gingival recession. The periodontal hygiene was the most relevant cause observed for the initiation and progress of periodontal disease in the majority of cases. Radiological examination was not practicable for the evaluation of bone loss in these patients. However, the few cases where orthopantomography was performed showed early to moderate periodontitis.

Unlike other studies, the present finding suggests that increased periodontal disease may correlate to the poor oral hygiene awareness in our country as compared to the western countries, which may exaggerate the already compromised leukocyte function and give a high incidence of periodontal disease in Down syndrome children in our country.

Conclusion

The prominent findings like flat nasal bridge (94.3%), hypertelorism (92.9%), high arched palate (78.6%) and fissured tongue (78.6%) in our study, suggest that they could be used as a reliable clinical markers to diagnose Down syndrome condition.

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