I J Pre Clin Dent Res 2014;1(2):8-13
April-June

International Journal of Preventive & Clinical Dental Research

Oral Hygiene Practices, Periodontal Status and Gingival Hyperplasia among Institutionalized Cerebral Palsy Patients in Bangalore

Abstract

Background: Cerebral Palsy is a common problem, the worldwide incidence being 2 to 2.5 per 1000 live births. In many countries cerebral palsy is the most frequent cause of physical disability and is second only to polio. This study is aimed to assess the oral hygiene practices and periodontal status of all the institutionalized cerebral palsy patients as a first step in assessing oral health status and treatment needs of these underserved society. **Methods**: The target population included all the institutionalized cerebral palsy patients of Bangalore (n= 231) in the age group of 3 to 22 years. In this study the required data was collected and recorded using printed proforma which consisted of two parts: the 1st part is the questionnaire specially developed to know the care taker's identification and qualification, cerebral palsied individual's medical history, dietary history, oral hygiene practices and other relevant information. The second part consists of periodontal assessment according to WHO Oral Health Assessment form 1997**.** The data was subjected to statistical analysis wherever required using inferential statistical techniques like ANOVA (one way) and Schiff's multiple comparison test. **Results and Conclusion**: It was found that about 16 (6.93%) of the study population sometimes brushed their teeth by themselves, the prevalence of bleeding and calculus in subjects aged 13 years and above was more common than periodontal pockets and 191 (82.68%) of the subjects exhibited localized gingival hyperplasia. The results show a pressing need for preventive dental care services for this special population.

Key Words

Cerebral palsy; institutionalized; oral hygiene practices; periodontal status

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INTRODUCTION

Enjoying a good health becomes a mirage for individuals born with disabilities. Not very far from us, there maybe a person....., for whom has a simple action liked reaching out, holding and bringing a cup to the mouth may be a Herculean task. This is a person with Cerebral Palsy (CP) - often described as 'an intelligent mind trapped in a disobedient body'. CP is a common problem, the worldwide incidence being 2 to 2.5 per 1000 live births.[1,2] In many countries cerebral palsy is the most frequent cause of physical disability and is second only to polio. About 1 of every 300 babies is born with or develops cerebral palsy. Advances in technology, medical care and community support mean that many people with a long standing disability, who would once have died before reaching late adulthood, are now having a life expectancy which approximates that of the general population. As the population ages and the number of people requiring services because of disability increases, the cost to society of providing these services is likely to

Table 1: Distribution of subjects with OH1 according to age and sex

Age	Sex	Caretaker/ themselves	%	themselves	%	Care taker	%	Total
3-7	1	0	0.00	0	0.00	45	100.00	45
	2	0	0.00	0	0.00	14	100.00	14
	Total	0	0.00	0	0.00	59	100.00	59
8-12	1	16	72.73	2	9.09	4	18.18	22
	2	0	0.00	41	75.93	13	24.07	54
	Total	16	21.05	43	56.58	17	22.37	76
13-17	1	0	0.00	29	55.77	23	44.23	52
	2	0	0.00	16	100.00	0	0.00	16
	Total	0	0.00	45	66.18	23	33.82	68
18-22	1	0	0.00	5	100.00	0	0.00	5
	2	0	0.00	23	100.00	0	0.00	23
	Total	0	0.00	28	100.00	0	0.00	28
G Total		16	6.93	116	50.22	99	42.86	231

Table 2: Distribution of subjects with OH2 according to age and sex

Age	Sex	0	%	2	%	Total
3-7	1	0	0.00	45	100.0	45
	2	0	0.00	14	100.0	14
	Total	0	0.00	59	100.0	59
8-12	1	16	72.73	6	27.3	22
	2	0	0.00	54	100.0	54
	Total	16	21.05	60	78.9	76
13-17	1	0	0.00	52	100.0	52
	2	0	0.00	16	100.0	16
	Total	0	0.00	68	100.0	68
18-22	1	0	0.00	5	100.0	5
	2	0	0.00	23	100.0	23
	Total	0	0.00	28	100.0	28
G Total		16	6.93	215	93.1	231

increase.[3-5] In a world in which there is increasing sensitivity to human rights and equality, one must view disability from a social perspective. Oral diseases are very common among these special groups[6] and no population-based study has been conducted at the national level to provide authentic data on the prevalence and incidence of oral diseases and treatment needs of cerebral palsy patients in India. Therefore we must rely on the projections made by sample surveys made on handicapped children and spastics. Thus, this study assesses the oral hygiene practices and periodontal status of all the institutionalized cerebral palsy patients as a first step in assessing oral health status and treatment needs of these underserved society.

MATERIALS & METHODS

The target population included all the institutionalized cerebral palsy patients of Bangalore (n= 231) in the age group of 3 to 22 years. The pre autoclaved diagnostic instruments were properly packed and carried to the institutes in sufficient numbers to avoid the interruption during examination. The address of the residential institutes and permission to conduct study patients was obtained from 'The Directorate of Welfare of Disability', Podium block, Post office building, Vidhan Soudha road, Bangalore.' A survey was systematically scheduled to cover all the institutes according to the convenience of the institutional authorities. A detailed monthly schedule was prepared well in advance by informing and obtaining consent from authorities of respective institutes. On an average 9-15 subjects were interviewed and examined in any given day during the survey period including the week ends. Although a detailed schedule plan was prepared meticulously few adjustment and changes were called for while working it out practically. In this study the required data was collected and recorded using printed proforma which consisted of two

Table 3: Distribution of subjects with OH3 according to age and sex

Age	Sex	0	%	2	%	Total
3-7	1	0	0.00	45	100.0	45
	2	0	0.00	14	100.0	14
	Total	0	0.00	59	100.0	59
8-12	1	16	72.73	6	27.3	22
	2	0	0.00	54	100.0	54
	Total	16	21.05	60	78.9	76
13-17	1	0	0.00	52	100.0	52
	2	0	0.00	16	100.0	16
	Total	0	0.00	68	100.0	68
18-22	1	0	0.00	5	100.0	5
	2	0	0.00	23	100.0	23
	Total	0	0.00	28	100.0	28
G Total		16	6.93	215	93.1	231

Table 4: Distribution of subjects with OH4 according to age and sex

Age	Sex	0	%	1	%	Total
3-7	1	0	0.00	45	100.0	45
	2	0	0.00	14	100.0	14
	Total	0	0.00	59	100.0	59
8-12	1	16	72.73	6	27.3	22
	2	0	0.00	54	100.0	54
	Total	16	21.05	60	78.9	76
13-17	1	0	0.00	52	100.0	52
	2	0	0.00	16	100.0	16
	Total	0	0.00	68	100.0	68
18-22	1	0	0.00	5	100.0	5
	2	0	0.00	23	100.0	23
	Total	0	0.00	28	100.0	28
G Total		16	6.93	215	93.1	231

parts: the 1st part is the questionnaire specially developed to know the care taker's identification and qualification, cerebral palsied individual's medical history, dietary history, oral hygiene practices and other relevant information. This questionnaire was filled by the examiner by interviewing the care taker conveniently during fieldwork. The second part consists of periodontal assessment according to WHO Oral Health Assessment form 1997.[7] This facilitates collection and recording of examination findings related to various oral health related parameters.

STATISTICAL METHODS

The survey data so obtained from the selected sample was compiled, systematized, tabulated and master table was prepared. From the master table the required data were picked up for data presentation as tables. The data of every table is presented concomitantly with a graph. The data was subjected to statistical analysis wherever required using inferential statistical techniques like ANOVA (one way) and Schiff's multiple comparison test.

RESULTS

Table 1 shows the distribution of the subjects who clean their teeth by themselves or with the help of care taker. About 16 (6.93%) of the study population sometimes brushed their teeth by themselves and sometimes took the help of the care taker and all of them were in the age group of 8-12 years. About 116 (50.22%) subjects brushed their teeth by themselves and all of them were above 8 years of age. 99 (42.86%) of the subjects were completely dependent on the care takers for their oral hygiene. **Table 2** shows the distribution of the subjects who used tooth brush or finger to clean their teeth. About 16 (6.93%) of the study population used sometimes brush to clean their teeth and sometimes cleaned with finger and all of them were in the age group of 8-12 years. About 215 (93.1%) subjects brushed their teeth with toothbrush. Not much difference was noticed

Table 5: Distribution subjects with various periodontal disease conditions

Age	Sex	Healthy	%	Bleeding	%	Calculus	%	P4p5	%	P4p5high	%	Total
3.0-7.0	1	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	45
	2	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	14
	Total	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	59
8.0-12.0	1	0	0.00	2	9.09	2	9.09	0	0.00	0	0.00	22
	2	1	1.85	3	5.56	2	3.70	0	0.00	0	0.00	54
	Total	1	1.32	5	6.58	4	5.26	0	0.00	0	0.00	76
13.0-17.0	1	27	51.92	52	100.00	45	86.54	0	0.00	0	0.00	52
	2	6	37.50	15	93.75	15	93.75	1	6.25	0	0.00	16
	Total	33	48.53	67	98.53	60	88.24	1	1.47	0	0.00	68
18.0-22.0	1	4	80.00	5	100.00	3	60.00	0	0.00	0	0.00	5
	2	20	86.96	20	86.96	23	100.00	3	13.04	1	4.35	23
	Total	24	85.71	25	89.29	26	92.86	3	10.71	1	3.57	28
Grand Total		58	25.11	97	41.99	90	38.96	4	1.73	1	0.43	231

Table 6: Distribution of subjects with gingival hyperplasia according to age and sex

Age	Sex	0	%	1	%	2	%	Total
3-7	1	0	0.00	1	2.22	44	97.78	45
	2	0	0.00	0	0.00	14	100.00	14
	Total	0	0.00	1	1.69	58	98.31	59
8-12	1	0	0.00	5	22.73	17	77.27	22
	2	1	1.85	11	20.37	42	77.78	54
	Total	1	1.32	16	21.05	59	77.63	76
13-17	1	0	0.00	12	23.08	40	76.92	52
	2	0	0.00	5	31.25	11	68.75	16
	Total	0	0.00	17	25.00	51	75.00	68
18-22	1	0	0.00	3	60.00	2	40.00	5
	2	0	0.00	2	8.70	21	91.30	23
	Total	0	0.00	5	17.86	23	82.14	28
G Total		1	0.43	39	16.88	191	82.68	231

between males and females in this regard. **Table 3** shows the distribution of the subject's frequency of tooth brushing according to age and sex. About 16 (6.93%) of the study population sometimes brushed their teeth once a day or some days did not cleaned their oral cavity only and all of them were in the age group of 8-12 years. About 215(93.1%) subjects brushed their teeth once daily. Not much difference was noticed between males and females in this regard. **Table 4** shows the distribution of material used for cleaning the teeth by the subject. About 16 (6.93%) of the study population sometimes brushed their teeth with tooth powder and sometimes with toothpaste and all of them were in the age group of 8-12 years. About 215 (93.1%) subjects brushed their teeth with tooth paste only. Not much difference was noticed between males and females in this regard. **Table 5** present the percentage of subjects with their periodontal status (bleeding, calculus and pockets) by level of severity. The prevalence of bleeding and calculus in subjects aged 13 years and above was more common than periodontal pockets. The prevalence of pockets 4-5mm and 6mm was 1.73 and 0.43 percent respectively in 13.22 years old females and no males had periodontal pockets. 58 (25.11%) individuals had healthy periodontium. **Table 6** present the percentage of subjects with gingival hyperplasia according to their age and sex. An attempt was made to note the presence or absence of localized or generalized gingival hyperplasia at the end of WHO (1997) proforma and the results showed that 39 (16.88%) individuals did not had any gingival hyperplasia; 191 (82.68%) of the subjects exhibited localized gingival hyperplasia and only one individual showed generalized gingival hyperplasia.

DISCUSSION

Oral health and quality oral health care contribute to holistic health, which should be a right rather than a privilege.[8] That is why individuals with cerebral palsy deserve the same opportunities for dental services as those who are healthy. Despite great achievements in oral health of populations globally,

problems still remain in many communities all over the world, particularly among the under-privileged groups like the cerebral palsied. Although there are many epidemiological studies concerning individuals with cerebral palsy in many countries, there is a paucity of information about the oral health status and treatment needs of cerebral palsied individuals in India. A few schools have resource rooms and employ special education teachers to help retain individuals with cerebral palsy in their system. And, these facilities are found only in very big cities in India like Bangalore. Thus, the study was confined to cerebral palsy individuals in Bangalore. Further, lack of access to cerebral palsy individuals residing at homes made the study to confine only to special needs institutions in Bangalore where the captive cerebral palsy individuals were available for the study and further implementation of complete oral care programmes.

Hence, this study was instituted to investigate the oral health status and base-line treatment needs of this population. The total number of institutionalized cerebral palsy individuals in Bangalore was 231 and all of them were included in the study. Among them 53.68% were male and 46.32% were females. The study group's age ranged from 3-22 years. In the present study 93% of the subjects daily cleaned their oral cavity. 50.22% subjects brushed their teeth by themselves and all of them were above 8 years of age, thus above 8 years of age most of them were self-dependent in maintaining oral hygiene. 42.86% of the subjects were completely dependent on the caretakers for their oral hygiene maintenance. 215 (93.1%) subjects cleaned their teeth with toothbrush. 16 (6.93%) of subjects brushed their teeth with tooth powder and toothpaste. 215 (93.1%) subjects brushed their teeth with toothpaste only. Thus, the rest of the subjects who are unable to brush with regular toothbrush need custom made toothbrushes to perform oral hygiene maintenance by themselves. The study subjects changed their toothbrush only when they flared completely and so, arrangements must be made to supply these institutions with toothbrushes every 3 months through the help of voluntary organizations. The commonly accepted recommendation for tooth brushing frequency has been twice a day.[9] In this study, all most all the subjects reported brushing once a day thus, disagreeing to this general advice. This fact may be part of overall caregiver's neglect of these individuals in relation to other basic health measures or due to lack of caregiver's special training particularly in tailor-made oral hygiene maintenance of cerebral palsy subjects or may reflect the attitude that oral health lacks importance in the overall scheme of health management. In Indian context, majority of the general population also practice through oral hygiene practice only once a day, so the study results of the cerebral palsy subjects can be compared to their societal norms.

The distribution of bleeding and calculus in subjects aged 13 years and above was more common. The distribution of pockets 4-5mm and above 6mm was 1.73 and 0.43 percent respectively in 13-22 years olds. 58 (25.11%) individuals had healthy periodontium. This observation was not similar with the results of Nallegowda *et al.*,[10] study where no significant periodontal disease indicators were present. This might be because of very small size of sample that was considered in their study, as it was a pilot study. The proportion of subjects with bleeding, calculus should be provided with proper oral prophylaxis and pockets of 3-4 mm and above 6 mm need specific periodontal therapies. In the current survey the distribution of loss of attachment was low (0.86%) and was present in only two 16 years aged individuals and showed no specific similarity with Nallegowda *et al.*,[10] study. This might be because of very small size of sample that was considered in their study as it was a pilot study or this may be because of individual variation in the present study i.e, with age there is cumulative exposure for any individual to a number of potentially destructive processes like chronic mechanical trauma due to tooth brushing, plaque associated periodontitis. The cumulative effects of these exposures may have led to increased loss of attachment in these two individuals. 82.68% of the subjects exhibited localized gingival hyperplasia and only one individual showed generalized gingival hyperplasia. Of the subjects in the study series, 90.78% presented associated epilepsy, while the remaining did not. In turn, of the 90.78% epileptic patients, 82.68% showed gingival hyperplasia, versus approximately 8% who did not. Among the 9% non-epileptic patients, no one presented gingival hyperplasia. This is in agreement with the study of Gimenez-Prats, Lopez-Jimenez[11] and thus, hyperplasia is related most often to anti epileptic drugs. To eliminate gingival hyperplasia, preventive measures should be taken, and motivation of the staff to enforce oral hygiene and limitation of psycho pharmaceutical treatments is of

paramount importance. To reduce the proportion of orally disabled cerebral palsy individuals with gingival problems, greater resources should be allocated. Continuous prophylactic care for this group can be achieved when specially trained personnel such as dental hygienists work in these centers. Concerned medical practitioners should be made aware of the oral health risks of long-term anti-epileptic medication and advised when possible to avoid anti-epileptics and prescribe alternatives.

Inadequate oral hygiene practices in this vulnerable group of cerebral palsy calls for the need to emphasize on oral hygiene maintenance procedures. More information regarding the frequency of cleaning the oral cavity, proper use of tooth brush, availability of fluoridated tooth paste, provision for custom made tooth brush, prevention of abnormal oral habits should be provided to the care giver's or the institutional authorities. The oral health status of these groups with cerebral palsy should be improved by heightened awareness of the fundamental need for effective prevention from the earliest age through pediatricians, health visitors, and community and primary care teams. Since the major problem to be tackled is improvement of the oral hygiene of these subjects with cerebral palsy, programmes that include oral hygiene in an individual's plan should be encouraged. Adequate follow-up of daily oral hygiene practice in cerebral palsy with disabilities is also required, and there is a strong need for in-service training programmes on oral hygiene for educators, care givers involved in the special care of these groups. It has been demonstrated that training care staff in basic oral health care procedures can help improve oral health.[12] To maintain an effective oral health care routine, the dental hygienist or therapist has a major role to play in motivating, providing reassurance, support, specific advice and training for individual problems. Positive links between educational establishments and dental services are essential for promoting the oral health of subjects with cerebral palsy. More effort from the community dental service and the institute's staff will be required to promote oral hygiene programmes in these institutes. The dental profession has a special responsibility to raise the awareness of caregivers concerning the need for early and regular contact with dental services for subjects with CP.

CONCLUSION

The oral health status of this cerebral palsy population is largely dependent on the ability of the dental services to provide treatment up to at least the same level as for normal children. The results show a pressing need for preventive dental care services for this special population; this situation must be improved and a suitable system devised for delivery of preventive measures. There is a distinct need for strengthening organized preventive and curative programmes for this institutionalized cerebral palsy population in Bangalore.

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