

Periodontal Health Status of A Group of (Non- Institutionalized) Mentally Disabled Children in Khartoum State

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ABSTRACT

Aim: The aim of this study is to assess the periodontal health status and its determinants among a group of mentally disabled children in Khartoum State and to compare it with a control group of children of normal intelligence.

Methods: Thirty seven mentally disabled children aged 8-10 years were examined at five centres of mentally disabled children in Khartoum State. A control group with normal intelligence quotient of a similar age and socioeconomic status was selected from schools nearby the centres visited. Both mentally disabled children and the children in the control group were examined for their plaque index, gingival index and periodontal pocket depth. A comparison was made between the mentally disabled children and the healthy children as well as between the subgroups of the mentally disabled children (mild, moderate, and severe). Questionnaires concerning the degree of mental disability, level of parent education, role of parents toward child oral health, were also used.

Results: The results revealed that the mentally disabled children showed higher scores of plaque and gingival index (1.9, 1.7 respectively) when compared with the plaque and gingival index of the control group (0.6, 0.6 respectively). No increase in gingival sulcus depth in both study and control group was found. According to the degree of mental disability there was statistically significant difference in plaque and gingival index among the mild, moderate and severe subgroups ($P=0.001$), the plaque and gingival index tend to increase with the severity of mental retardation. **Conclusion.** Mentally disabled children showed more plaque when compared with healthy controls. Periodontal disease was more prevalent among mentally disabled children as presented in the form of gingivitis and the degree of severity depends on the degree of mental disability.

Keywords: Mental disability, Periodontal health

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INTRODUCTION

It is estimated that there are 500 million people with disabilities worldwide, the largest number of whom is to be found in Majority World (1). The American Association on intellectual and developmental disabilities (AAIDD) defines mental disability as significant limitations both in intellectual functioning and in adaptive behaviour as expressed in conceptual, social, and practical adaptive skills. This disability is manifested during the developmental period (before age 18)(2). Intellectual limitations refer to an Intelligence Quotient (IQ) which falls two standard deviations below the population mean of 100 (<70) and adaptive functioning limi-

tations refer to impairments in at least two out of ten skill areas(3). Mental retardation has been classified by diagnostic and statistical manual of mental disorders 4th edition (DSM-4) as mild (IQ. 50-70), moderate (IQ. 34-55), severe (IQ. 20-40), or profound (I.Q. less than 20) mental retardation subgroups (4) According to the fourth census of Sudan (1993), all the disabled constitute about 15.9 per 1000 in the northern state of Sudan and the mentally retarded about 1.5 per 1000, while in Khartoum state all the disabled constitute 11.6 per 1000 and the mentally retarded 1.1 per 1000. The figures of the mentally retarded children in Sudan is underestimated for many reasons ; people in Sudan do not

give the true number of the family members especially the presence of mentally disabled children and tend to deny their existence because of the impact, mainly on females as it reduces their chances of marriage (5).

Poor oral hygiene and periodontal diseases represent major problems for the mentally disabled children (Tenisi, 1981) (6) (Martens *et al.*, 2000) (7). The poorer oral health of people with disabilities is attributable to number of causes. In part, lack of daily oral hygiene care procedures (8).

Gabre and Gahnberg (1994) found that the oral health status of individual with mental disability is associated with the severity of the condition (9). The etiology of the disability, IQ level, parent’s level of education, and poor economic status were also found to be influencing the oral health status of the mentally disabled children (10,11).

Although oral health care is becoming an increasingly an integrated part of an overall medical care, it is one of the greatest unattended health needs of the disabled people (12). In developing countries the situation is even worse with lack of both medical and oral health care facilities and absence of dental supervision in institutions and day centers for children with special needs. Therefore, the present study was carried out to determine the periodontal health status among a group of mentally disabled children attending public day centers for children with special needs in Khartoum State-Sudan.

MATERIAL AND METHODS

Prior to the conduct of the study, ethical approval was obtained from Ethical committee for research of the dental faculty board of Khartoum University –and from the ethical committee of the ministry of social affairs-Khartoum.

SAMPLE

The study sample consisted of children attending five different public day centers for individuals with special needs in Khartoum state-Sudan. The names and loca-

tions of the centers were taken from the Ministry of welfare and Social Affairs. The children attended the center at 8 am and left at 3 pm. Only children with mental disabilities (age 8-10) were included in the study group. Children with motor disabilities, serious medical problems or those who take regular medications were excluded. The total number of children in this age group was 58. Written consents were sent to all parents of the children scheduled for examinations. Only 37 children were included in the final examinations because of some logistic difficulties including transportation, refusal of the examination by the child or the parents. A control group of age -matched children with normal intelligent was recruited from schools nearby the centers visited.

DATA COLLECTION

A structured questionnaire was sent to be completed by the parents. The questionnaire included information about the child’s demographic data including child’s age, gender and level of parent’s education. Information about oral hygiene habits including the frequency of tooth brushing and the role of the parents towards the child’s oral health were also obtained. The degree of mental disability was registered from the child’s records in the institute. Children were divided accordingly into those with mild mental disability (IQ. 67-52), moderate mental disability (IQ. 51-36), and severe mental disability (IQ. d” 35). Of the whole sample, only three (1.1%) were Down’s syndrome patients and were categorized in the moderate mentally disabled group.

ORAL EXAMINATIONS

Dental examinations were performed using proper light, dental mirror and periodontal probe (William pattern). Periodontal assessments included all teeth

present in the mouth. The following parameters were recorded: Plaque Index (PI), gingival Index (GI), and Periodontal Pocket Depth (PPD). Plaque and gingival index were recorded according to the criteria given by Loe and Silness (13,14). For periodontal pocket depth (PPD) 4 sites were probed (mesial and distal) on the buccal and palatal (lingual) surfaces of each tooth. The examinations were carried by one examiner (T.N) with the help of a dental assistant.

STATISTICAL DATA ANALYSIS

All data were analysed using SPSS. The mean plaque index, mean gingival index and mean pocket depth were recorded. Comparisons of the parameters means between study and control group were made using student t-test.

RESULTS

The Study Group

The study group consisted of 37 mentally disabled children (mean age 10.6± 1.6). 56.8 % were males (n=21) and 43.2 % were females (n=16). Males had significantly higher mean plaque index (P<0.001) and mean gingival index (P=0.001) than females (Table 1).

No pocket depth greater than 3 mm was recorded.

Periodontal Parameters Related to the Degree of Mental Retardation

32.4% of the study group were mildly disabled (n=12), 45.9% were moderately disabled (n=17), and 21.6% represented severely disabled children (n=8). The mean plaque index of the moderately disabled children was significantly higher than that of the mildly disabled children (P<0.01). The severely disabled children showed the highest plaque index with statistically significant difference when compared with the

Table 1: Mean plaque index and gingival index among males and females in the study group

	No. (%)	Mean plaque index (±SD)	Mean gingival index (±SD)
Males	21 (56.8)	2.6±0.2	2.3±0.1
Females	16 (43.2)	1.9±0.1	1.6±0.2
		<i>t= 12.9</i>	<i>P=0.001</i>

moderately disabled children (P=0.001).

The mean gingival index of the moderately disabled children was significantly higher than that of the mildly disabled children (P=0.001). The severely disabled

children had the highest gingival index with statistically significant difference when compared with the moderately disabled children (P=0.001). The periodontal health parameters within these subgroups are shown in Table (2).

Table 2: Periodontal parameters (plaque index and gingival index) of the study group related to the degree of mental disability

	Degree of mental disability	Mean	SD
Plaque index	Mild	1.6	0.3
	Moderate	1.9	0.2
	Severe	2.2	0.2
Gingival index	Mild	1.5	0.2
	Moderate	1.7	0.04
	Severe	1.8	0.03
<i>t= 3.75</i>		<i>P=0.001</i>	

Table 3: Periodontal parameters (plaque index and gingival index) of the study group related to the tooth brushing helper

	Tooth brushing habits	No. (%)	Mean	SD
Plaque index	Brushing with help	15 (40.5)	1.8	0.1
	Brushing without help	22 (59.5)	2.0	0.3
Gingival index	Brushing with help	15 (40.5)	1.6	0.1
	Brushing without help	22 (59.5)	1.8	0.1
<i>t= 2.86</i>		<i>P=0.01</i>		

Table 4: The plaque index among study group related to the frequency of tooth brushing

Tooth brushing frequency	No.(%)	Mean Plaque Index	SD
Brushing once	32 (86.5)	1.9	0.2
Brushing twice	5 (13.5)	2.0	0.3
<i>t= 1</i>		<i>P=0.5</i>	

Table 5: The mean plaque index and gingival index among the study and the control group

		No.	Mean	SD
Plaque index	Study	37	1.9	0.2
	Control	37	0.6	0.3
Gingival index	Study	37	1.7	0.1
	Control	37	0.6	0.2
<i>t= 21.7</i>		<i>P=0.001</i>		

Table 6: The mean plaque index related to frequency of tooth brushing

		No. (%)	Mean	SD
Brushing once	Study	32 (86.5)	1.9	0.2
	Control	18 (48.6)	0.7	0.4
Brushing twice	Study	8 (21.6)	2.04	0.3
	Control	19 (51.4)	0.5	0.2
<i>t= 13.3</i>		<i>P=0.001</i>		

The Periodontal Parameters (Plaque Index and Gingival Index) Related to the Tooth Brushing Habits

Mentally disabled Children who brush their teeth without help had significantly higher plaque scores than those who were helped by others (P<0.01). The mean gingival index was higher among mentally disabled children who brush their teeth without help than those who were helped by others. The difference was statistically significant (P=0.01) (Table 3).

Plaque scores were higher among those who brushed twice daily than those who brushed once per day, however the difference was not statistically significant (P=0.5) (Table 4).

The study group vs. the control group

The control group consisted of 37 children (mean age 10±1.5). Males and females (51%, 49% respectively).

The mean plaque index and gingival index were significantly higher in the study group than in the control group (P < 0.001) (Table 5).

Mentally disabled children who brush their teeth once a day had significantly higher plaque scores than those in the control group (P =0.001). This was also observed among mentally disabled children who brush their teeth twice a day who showed higher plaque scores than children in the control group (P=0.001) (table 6) (figure 1)

DISCUSSION

Most studies assessing oral health status among people with intellectual disabilities reported poor levels of oral hygiene (11,15,16,17) which is in accordance with the findings of this study. The mentally disabled subjects of the present study had higher plaque and gingival index than that found in non-disabled children of comparable age groups. We have chosen this age group to avoid hormonal disturbances related to puberty. Our results confirm the findings of other studies concerning the higher plaque and gingival index among

individuals with mental disabilities (7,15,18).

Significant difference was found in the mean plaque and gingival index among males and females in the mentally disabled group in the present study which can indicate that the family has more attention towards the oral hygiene of the mentally disabled females than the males of the same group. These results are similar to the findings reported by Connick (2001) (19), although inconsistent with those findings by Kao *et al* (1991) (20) who concluded that the gender has no influence on plaque and gingival index among mentally disabled children.

According to the degree of mental retardation, there were statistically significant differences in plaque and gingival index between the mild, moderate and severe mentally disabled children. The plaque and gingival index tend to increase with the severity of the mental disability. Similar results have been shown earlier by Martens *et al.*, (2000) (7), Rao *et al.*, (2005) (17), and Kawagushi and Nakashima, (1990) (21). In this study there was statistically significant difference in plaque and gingival index among mentally disabled children who brush their teeth by themselves and those who were helped by others with higher plaque scores in children who used to brush their teeth by themselves than those who were helped other persons, and this is similar to the findings reported in earlier studies(22,23) but disagree with the findings by Nielsen, (1990) (24) who found higher plaque and gingival index among disabled children when the child and the parents together were responsible for the child's tooth brushing than when the children brushed their teeth on their own. Regarding the frequency of teeth cleaning the study showed higher plaque index in mentally disabled children who had brushed their teeth twice than those who had brushed their teeth once a day, and the difference was not statistically significant. The depth of the gingival sulcus for both mentally disabled and non-disabled children was measured. No periodontal pockets of depth >3mm were found, hence

the result were not worthy to be computed and presented, and this was even true for the mentally retarded children with Down's syndrome, most probably due to the very small percentage of down's syndrome patients in our sample. However, this may differ from the findings of other investigators who showed that early signs of periodontitis are frequently seen in Down's syndrome children as early as 11 years of age (25). but agrees with the finding of De fueiredo *et al.*, (2005) (26).

CONCLUSION

Taking into consideration the results of the present study, mentally disabled children tend to show poorer oral hygiene level and consequently more gingival inflammation when compared to the non-disabled children of the same age group. In addition the oral health status of the present population was influenced by degree of mental disability. Oral hygiene improvement of the non-institutionalized mentally disabled children can be achieved by teaching and motivating parents and children. Furthermore, Oral health promotion programs should be aimed specifically at parents of disabled children and special needs schools.

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