Periodontal Treatment Needs Amongst 9-14 Year-old Institutionalized Mentally Retarded Children in Mashhad, IRAN

Nematollahi H. [a*], Makarem A. [b], Noghani AR. [c]

[a] Dept. of Pediatric Dentistry, Faculty of Dentistry, Dental Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
[b] Dept. of Pediatric Dentistry, Faculty of Dentistry, Dental Research Center, Mashhad University of Medical Sciences, Mashhad, Iran.
[c] Pediatric Dentist, Mashhad, Iran.

KEY WORDS

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ABSTRACT

Statement of Problem: Periodontal problems seem to be more common in mentally retarded children due to the poorer oral hygiene than in mentally healthy children, but no data are available on periodontal treatment needs in these children in Mashhad.

Purpose: The purpose of this study was to determine periodontal treatment needs of the mentally retarded children in Mashhad, Iran, using the Community Periodontal Index for Treatment Needs.

Materials and Method: In this descriptive cross-sectional study, 258 mentally retarded children aged 9-14 years consisting of 38 educable, 95 trainable and 125 profound children residing in governmental and private centers in the city of Mashhad, Iran were assessed for Community Periodontal Index for Treatment Needs (CPITN). For analyzing the results of the study, T-test and analysis of variance (ANOVA) were used. The level of significance was set at $p < 0.05$.

Results: Statistical analysis revealed that the mean CPITN among different age groups was 1.34±0.49. The mean CPITN increased with age ($p = 0.01$) and with the level of mental retardation ($p = 0.001$). The treatments needed for most of the children were oral hygiene instruction (74.42%), followed by scaling (23.64%), and extensive periodontal treatments (1.16%). Only, 0.78% of the population demonstrated healthy periodontal tissue. Mean CPITN was significantly higher in governmental centers than private ones ($p = 0.02$).

Conclusion: It was concluded that the periodontal treatment needs (oral hygiene instruction) of the mentally retarded children was high in Mashhad.

*** Corresponding author:** Nematollahi H. **Address:** Dept. of Pediatric Dentistry, Faculty of Dentistry, Mashhad University of Medical Sciences, Mashhad, Iran; **Tel:** 0511-8829501-9;
E-mail: nematollahih@mums.ac.ir

Introduction

Mental retardation is a disorder characterized by low scores on tests of mental ability, limited ability in aspects of daily living and significantly below-average social and communication skills**.** Mental retardation is one of the most frequently encountered and most distressing disabilities among children in industrialized and developing countries [1]. Several studies have reported the dental health of the mentally retarded individuals [2]. These patients have a lower level of oral

hygiene; thus, periodontal problems are more common in them [3-7]. It is common to find poor dental hygiene with high levels of dental plaque, calculus and gingivitis in early age, intense halitosis and food remnants between the teeth and more consumption of cariogenic and soft diet in these patients [6]. Prolonged retention of food particles in the oral cavity might result in a higher incidence of dental caries and gingival inflammation [3].

Due to a lesser stress tolerance of these patients, some problems are almost invariably present when taking dental management. In any case, treatments could and should be carried out, taking some special measures for controlling behavioral problems, such as general aneasthesia or deep intravenous sedation [6].

Bamjee, Chikte and Cleaton et al. examined a total of 213 handicapped boys and girls in Johannesburg. They found that the vast majority of them required removal of supra- and subgingival calculus [5]. Johnson, Seymour and Greeley et al. as well as other investigators reported that the type of disability had a significant effect on the periodontal problems observed. Children with mental retardation had the poorest levels of oral hygiene and the greatest periodontal treatment needs [8-13]. Furthermore, Svatum and Gjermo found that increased age and a high degree of mental deficiency are the factors that apparently contributed to the impairment of periodontal health and increased treatment needs [14]. In order to provide effective periodontal care for mentally retarded children, it is essential to ascertain treatment needs, so that decisions can be made based on improving care. Yet, few reports have been publicshed regarding periodontal treatment needs of mentally retarded children in Iran.

The objectives of the present study were to determine the periodontal treatment needs of 9-14 year mentally retarded children in the city of Mashhad, Iran and investigate the association between their periodontal health status, treatment needs and level of mental retardation.

Materials and Method

In this descriptive cross-sectional study, the periodontal treatment needs were assessed in all mentally retarded children aged 9-14 years (mean 9.96±3.71), residing in governmental and private centers in Mashhad. 266 children were in the study group and 258 of them (140 male and 118 female) had fully erupted index teeth which could be assessed adequately. The intelligent quotient (IQ) of children in these centers ranged between "20-70". This IQ had been deter-mined prior to placing the children in these centers. The Revised Stanford Binet Intelligence Test was used to assess the IQ. An IQ of 52-67 was indicative of mild mental retardation (Educable mentally retarded) 36-51 indicated moderate (Trainable mentally retarded), and 35 and below were considered as severe mental retardation (profound mentally retarded). In this study from 258 children, 38 were in the educable group, 95 in the trainable group, and 125 were in the pro-found group.

This study was approved by ethics committee of Mashhad University of Medical Sciences. All the examinations were conducted under the same conditions for all the subjects in a dental chair by a single examiner to avoid inter-examiner bias. The criteria and method of assessment for periodontal disease was the community periodontal index for treatment need (CPITN). The data were recorded for sextants as was recommended by the FDI-WHO Joint Working Group [15]. A dental mirror and a CPITN probe, type WHO-1978, spherical in shape, were used to determine the bleeding response, the probing depth and the presence of calculus [16]. Six segments were assessed for each individual. Pockets' depths were measured at six sites around each tooth (mesial, middle, and distal on both vestibular and lingual/ palatal surfaces). The specified index teeth were16, 11, 26 and 36, 31, 46. The subjects were classified into different treatment need categories according to the highest scores which were recorded during the examination, as was recommended (Table 1).

Statistical analysis of the data was carried out, using the SPSS version 10.5. To check the hypothesis,

Table1 Community Periodontal Index for Treatment Needs (CPITN)

Periodontal Status	T.N. Code*	Treatment Needs
Healthy	0	No need for periodontal treatments
Bleeding on probing	1	Improved oral hygiene
Supragingival or subgingival calculus	2	Calculus removal and improved oral hygiene
Pocket 4 or 5mm	2	Calculus removal and improved oral hygiene
Pocket > 6mm	3	Complex periodontal care

T.N.Code*= Treatment Needs Code

controlling tests of the inductive statistics, such as T student test and one-way analysis of variance (ANOVA) were applied. The level of significance was set at $p < 0.05$.

Results

As shown in Table 2, mean CPITN among different age groups of children was 1.34±0.49 which increased with age ($p = 0.01$). Table 3 demonstrates the distribution of patients according to their periodontal treatment needs in relation to gender. No significant difference was found in the type of periodontal treatment needs in terms of gender. In the present study, only 2 patients (0.78%) had no signs of periodontal disease (code 0); 192 (74.42%) presented gingival bleeding after gentle probing (code 1) which required just oral hygiene instruction; 61 (23.64%) had supra- or subgingival calculus (code2) or pathologic pocket 4-5mm (code3) which required removal of supra- or subgingival calculus, and 3 (1.16%) had deep pathologic pocket more than 6 mm (code 4) which required complex periodontal treatment.

Table 2 Mean and standard deviation of CPITN scores by age groups

Age groups (year)	n	%	Mean ± SD	
9-10	90	34.90	1.30	0.45
11-12	76	29.45	1.37	0.46
13-14	92	35.65	1.45	0.54
Total	258	100	1.34	0.49

Result of ANOVA test: F = 3.37, D.F = 4, $p = 0.01$

In our study, the mean CPITN increased with the level of mental retardation (Table 4). Profound children had more treatment needs (1.50±0.52) and trainable children had fewer treatment needs (1.20±0.43) while educable children had the least needs (1.13±0.33). The differences were statistically significant ($p = 0.001$).

Table 3 Distribution of patients according to their periodontal treatment needs and sex

Treatment Need	Male		Female		Total	
	n	%	n	%	n	%
TN 0	1	0.7	1	0.8	2	0.78
TN 1	110	78.6	82	69.4	192	74.42
TN 2	27	19.3	34	29	61	23.64
TN 3	2	1.4	1	0.8	3	1.16
Total	140	100	118	100	258	100

Results of Chi-square Test $X^2 = 3.05$ $p = 0.38$

72.9% of the patients resided in governmental centers. The results showed that the mean CPITN was significantly higher in governmental centers (1.37± 0.52) than private ones (1.25±0.41). This difference was statistically significant ($p = 0.02$). Further-more, 43.7% of the patients residing in the govern-mental centers and 25.6% of those in private institutes needed scaling and surgery.

Table 4 Comparison of mean CPITN according to mental retardation level

Mental Retardation Level	n	%	Mean ± SD	
Educable	38	14.72	1.13	0.33
Trainable	95	36.82	1.20	0.43
profound	125	48.45	1.50	0.52
Total	258	100	1.34	0.49

Result of ANOVA test : F = 19.32, D.F = 2, $p = 0.001$

Discussion

Providing dental treatment for a person with mental disability requires adjusting to social, intellectual and emotional delays. Short attention span, restlessness, hyperactivity and erratic emotional behavior may

characterize the children with mental retardation undergoing dental treatment [17].

Due to limitations in patients' cooperation in this study, meticulous periodontal examinations were difficult; nevertheless, bleeding response, probing depth and presence or absence of calculus were carefully recorded.

The proportion of children requiring periodontal treatment in this study was very high. The most prevalent treatment need was oral hygiene instruction (TN1), followed by plaque control and scaling (TN2). The need for complex periodontal treatment (TN3) was required by a small percentage of cases (1.16%). Comparison of the results of this study with those obtained by Bamjee et al. [5] indicated that periodontal treatment needs fall mainly into the TN1 category. Furthermore, Bhasar and Damle examined a total of 593 handicapped children in the age group of 12-14 years in Bombay. They found that the bleeding and calculus components were higher than the healthy components in all the groups and almost all the children required treatment in the form of deep scaling and/or prophylaxis and oral hygiene instructions [18]. This means the intervention of dental hygienists is required for improving the oral hygiene of mentally retarded children. The mechanical removal of the dental plaque is of primary importance for maintainning periodontal health. However, mentally handicappped people are unable to achieve adequate level of plaque control, because of their physical and mental limitations. The most obvious reason for poor oral hygiene in a mentally retarded child is the physical inability to clean the oral cavity adequately; another reason is lack of self-discipline because of overprotective parents.

The prevalence of poor gingival health in the subjects of this study is similar to the findings of previous studies [3-5, 19-22]. Retention of food particles in the oral cavity due to lack of normal masticatory function is more prevalent in the mentally retarded children, leading to periodontal disease. Mentally retarded children should have access to dental care preventive procedures under the same conditions like the rest of the population. But unfortunately, they have difficulty receiving the same health services as other healthy children in the developing societies including Iran. This justifies planning and coordination efforts to take care of them in the dental care preventive procedures. The results also indicate that the periodontal problem becomes even worse with increasing age. Calculus is significantly more prevalent in mentally retarded children and increases with age which correlates with increasing levels of gingival inflammation. This finding is in concordance with the results of other investigators [23-24]. In the present study, the mean CPITN increased with level of mental retardation (p <0.001) .There seems to be a correlation between the poor oral hygiene and the severity of the mental retardation. This finding is in the same line with the results from previous investigations [8-12, 25]. Individuals with mental retardation may be reluctant to seek health services because they are frightened of new surroundings and treatment procedures particularly dental visits. Premeditation, sedateon, use of physical or medical restraints, general anesthesia, and hospital operating room procedures may be necessary for behavioral management difficulties. It was also found in this study that there were significantly poorer levels of oral hygiene and a greater prevalence of periodontal problem in the mentally retarded children living in governmental centers than those in private ones. Advanced training is needed for the staff of governmental institution to enhance their oral health.

Conclusion

The results of this study indicated that the periodontal treatment needs (oral hygiene instruction) in the mentally retarded children were high which increased with age and severity of mental retardation. It is evident that early intervention with oral motor training and frequent regular preventive program for the mentally retarded children will reduce periodontal disease and

the need for treatment under general anesthesia in the future.

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References

[1] El-Hazmi MA, Al-Swailem AA, Al-Mosa NA, Al-Jarallah AA. Prevalence of mental retardation among children in Saudi Arabia. East Mediterr Health J 2003; 9: 6-11.

[2] Choi NK, Yang KH. A study on the dental disease of the handicapped. J Dent Child (Chic) 2003; 70: 153-158.

[3] Desai M, Messer LB, Calache H. A study of the dental treatment needs of children with disabili-ties in Melbourne, Australia. Aust Dent J 2001; 46: 41-50.

[4] Kozak R. Dental and periodontal status and treatment needs of institutionalized mentally retarded children from the province of West Pomerania. 2004; 50: 149-156.

[5] Bamjee Y, Chikte UM, Cleaton-Jones PE. Assessment of periodontal status and treatment needs of a disabled population using the CPITN. SADJ 1999; 54: 413-417.

[6] Escribano Hernández A, Hernández Corral T, Ruiz-Martín E, Porteros Sánchez JA. Results of a dental care protocol for mentally handicapped patients set in a primary health care area in Spain. Med Oral Patol Oral Cir Bucal 2007; 12: 492-495.

[7] Simon EN, Matee MI, Scheutz F. Oral health status of handicapped primary school pupils in Dares Salaam, Tanzania. East Afr Med J 2008; 85: 113-117.

[8] Johnson CD, Matt MK, Dennison D, Brown RS, Koh S. Preventing factitious gingival injury in an autistic patient. J Am Dent Assoc 1996; 127: 244-247.

[9] Seymour RA, Thomason JM, Ellis JS. The pathogenesis of drug-induced gingival overgrowth. J Clin Periodontol 1996; 23: 165-175.

[10] Greeley CB, Goldstein PA, Forrester DJ. Oral manifestations in a group of blind students. ASDC J Dent Child 1976; 43: 39-41.

[11] Shaw L, Maclaurin ET, Foster TD. Dental study of handicapped children attending special schools in Birmingham, UK. Community Dent Oral Epidemiol 1986; 14: 24-27.

[12] Nunn JH, Murray JJ. The dental health of handicapped children in Newcastle and Northumberland. Br Dent J 1987; 162: 9-14.

[13] Lindh J, karring T, Lang N. Clinical periodontology and implant dentistry. 4th ed., Denmark: Munksgard; 2003. p. 52.

[14] Svatun B, Gjermo P. Oral hygiene, periodontal health and need for periodontal treatment among institutionalized mentally subnormal persons in Norway. Acta Odontol Scand 1978; 36: 89-95.

[15] Cutress TW, Ainamo J, Sardo-Infirri J. The comm.-unity periodontal index of treatment needs (CPITN) procedure for population groups and individuals. Int Dent J 1987; 37: 222-233.

[16] Ainamo J, Barmes D, Beagrie G, Cutress T, Martin J, Sardo-Infirri J. Development of the World Health Organization (WHO) community periodontal index of treatment needs (CPITN). Int Dent J 1982; 32: 281-291.

[17] MacDonald RE, Avery DR, Stookey GK. Dental caries in the child and adolescent. In: MacDonald RE, Avery DR, editors. Dentistry for the child and Adolescent. 8th ed., Philadelphia: Mosby Co; 2004. p.541.

[18] Bhavsar JP, Damle SG. Dental caries and oral hygiene amongst 12-14 years old handicapped children of Bombay, India. J Indian Soc Pedod Prev Dent 1995; 13: 1-3.

[19] Bagić I, Verzak Z, Cuković-Cavka S, Brkić H, Susić M. Periodontal conditions in individuals with Down's syndrome. Coll Antropol 2003; 27: 75-82.

[20] Maiwald HJ, Engelkensmeier B. The oral health status and the tasks of pediatric dental care for mentally handicapped children and adolescents.

Zahn Mund Kieferheilkd Zentralbl 1990; 78: 11-17.

[21] Denloye OO. Periodontal status and treatment needs of 12-15 year old institutionalized mentally handicapped school children in Ibadan, Nigeria. Odontostomatol Trop 1999; 22: 38-40.

[22] Tóth V. Periodontal status of institutionalized mentally retarded patients. Fogorv Sz 1994; 87: 107-111.

[23] Evans DJ, Greening S, French AD. A study of the dental health of children and young adults attending special schools in South Glamorgan. Int J Paediatr Dent 1991; 1: 17-24.

[24] Svatun B, Gjermo P. Oral hygiene, periodontal health and need for periodontal treatment among institutionalized mentally subnormal persons in Norway. Acta Odontol Scand 1978; 36: 89-95.

[25] Shapira J, Efrat J, Berkey D, Mann J. Dental health profile of a population with mental retardation in Israel. Spec Care Dentist 1998; 18: 149-155.