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ORIGINAL ARTICLE

Comparative Study of Dental Caries, Malocclusion, and Treatment Needs among Children with and without Physical Disabilities in Ahmedabad City, Gujarat, India

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ABSTRACT

Background and objective: Children with disabilities appear to have poorer oral health than their nondisabled counterparts. The objectives of this study were to conduct a community-based oral health survey among school children with physical disabilities and to compare the findings with an age- and gender-matched sample from mainstream schools.

Materials and methods: Following World Health Organization (WHO) oral health survey criteria, 103 handicapped children and 214 healthy controls were examined. Comparison of dental caries, malocclusion, and treatment needs were done using chi-square test and Student t-test ($p < 0.05$).

Results: Both the groups had high dental caries prevalence with less decayed, missing, and filled teeth (DMFT) score. Handicapped children had more severe malocclusion then healthy controls.

Conclusion: Increased oral health promotion for parents and caretakers both at primary school age and at the preschool stage to enable them to implement effective preventive regimes for their children. Any health promotion strategy for these children must include improving access to dental care and encouraging uptake of dental services.

Keywords: Dental caries, Gujarat, Malocclusion, Physically disabled children.

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INTRODUCTION

The health of the mouth and surrounding craniofacial structures is integral to an individual's total health throughout his or her life. Oral and craniofacial diseases and conditions include dental caries, periodontal diseases, cleft lip and palate, oral and facial pain, and oral and pharyngeal cancers.[1]

Since common oral health problems seldom results in death or life-threatening impairment, more disabling medical problems often overshadow the importance of preventing and controlling oral disease. However, the true cost of oral disease, including pain and suffering, lost productivity and attendance at work and school, possible contributions to other systemic disease conditions, and the social disability associated with poor oral health, cannot easily be ignored. Most oral health problems, however, are preventable and preventive activities are inexpensive, painless, and very effective.[2]

American Health Association defines a child with disability as a child who for various reasons cannot fully make use of all his or her physical, mental, and social abilities. The disabled form a considerable section of the community, and it is estimated that there are about 500 million people with disabilities worldwide, and they are on the increase in proportion to the general population.[3-5]

Children with disabilities may be physically, mentally, or socially challenged. In 1995, the Government of India, under the "Persons with Disabilities Act," described "handicapped" as a person with one or more of the following disabilities: Impaired vision, leprosy-cured, hearing impaired, locomotor disability, mental retardation, and mental illness. It may be pointed out that a child who is physically or mentally handicapped also meets with social handicaps to the extent to which he/she is subject to social rejection or misunderstanding and cannot make use of the normal value of social fulfillments.[6] Children with disabilities may have more marked oral pathologies either because of their actual disability or for other medical, economic, social reasons, self-mutilating behaviors (excessive tooth grinding), cariogenic effect of medicines with high sugar content, or even because their parents have difficulty in carrying out proper regular oral hygiene measures.[7]

Dental caries is the most prevalent disease among mentally retarded children worldwide, and "dental treatment is the greatest unattended health need of the

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disabled".[8] Malocclusion is characterized by deviations from the norm in size, shape, or position of maxilla and mandible.[9]

Children with disabilities appear to have poorer oral health than their nondisabled counterparts. Variable access to dental care, inadequate oral hygiene, and many other disability-related factors may account for differences; however, their diet, medication, physical limitations, lack of oral hygiene, and the attitude of their parents and the health care providers all contribute to the poor oral health.[10] Some of the most important reasons may be: inadequate recall systems, practical difficulties during treatment sessions, socioeconomic status, underestimation of treatment need or pain, communication problems, and bad cooperation.[8,11-13]

The prevention and treatment of the early stages of dental disease lie in the provision of self-care, but this may be difficult for the handicapped children. In India, there is little data available relating to dental health in handicapped children, especially in Gujarat.

The objectives of this study were to conduct a community-based oral health survey among school children with physical disabilities and to compare the findings with an age- and gender-matched sample from mainstream schools. The oral health survey aimed to determine differences in the dental caries experience, prevalence of dental trauma and malocclusion between school children with and without physical disabilities in Ahmedabad. The null hypothesis tested is that there was no significant difference in the dental caries experience, prevalence of dental trauma and malocclusion school children with and without physical disabilities.

MATERIALS AND METHODS

The subjects were examined using mouth mirror and community periodontal index (CPI) probe where necessary in accordance with World Health Organization (WHO) criteria for diagnosis of dental caries and malocclusion. All instruments were sterilized, and type III examination was followed.[14]

A pilot survey was conducted to know the appropriateness and feasibility of the survey. Inter examiner reliability was tested using weighed kappa statistics, which was 91.2%.

Handicapped children (n = 103) from the institute for special children from the city were included in survey. School children from the surrounding area were included as age- and gender-matched controls (n = 214). Prior permission for survey was taken, and on predecided dates examinations were conducted. Those who were not willing to participate were excluded.

The proforma were arranged systematically and information was transferred from the survey proforma to a computer. A master chart was created in Microsoft Excel 2007 for the purpose of data analysis. The statistical software Statistical Package for the Social Sciences (SPSS) version 15.0 was used for the analysis of the data. Chi-square test was used to compare dental esthetic index (DAI) scores and Student t-test was used to compare decayed, missing, and filled teeth (DMFT) scores.

RESULTS

Among the handicapped and school children enrolled in the study, the caries prevalence was 1.75 ± 1.9 and 1.14 ± 1.1 respectively ($p < 0.05$) with D component 90 and 100% respectively (Table 1).

Sixty (58.25%) handicapped and 124 (57.94%) normal children required one/two surface restoration. Pulp therapy was needed in 2 (1.94%) handicapped and 20 (9.34%) normal children. Very few were in need of extraction (2 (1.9%) handicapped and 10 (4.67%) normal children).

The distribution of dentofacial anomalies among study population showed that crowding was present in 71 (68.9%) handicapped and 30 (14%) normal children. Prevalence of spacing and midline diastema was considerably higher in handicapped than normal children. Not a single normal child had open bite.

Normal children had very less maxillary and mandibular irregularity when compared to handicapped

Table 1: Comparison of dental caries and malocclusion among children with and without physical disabilities

		Handicapped	*Healthy control*	
		Mean ± SD	*Mean ± SD*	*p-value*
DMFT (decayed, missing, and filled teeth)	DT	1.61 ± 1.9	1.14 ± 1.1	0.008*
	MT	0.03 ± 0.2	0.00 ± 0.0	0.053*
	FT	0.11 ± 0.5	0.00 ± 0.0	0.003*
	DMFT	1.75 ± 1.9	1.14 ± 1.1	0.001*
		n (%)	n (%)	
Dental esthetic index	≤25 (No abnormality)	27 (26.2)	192 (89.7)	0.001*
	26–30 (Definite)	24 (23.3)	14 (6.5)	
	30–35 (Severe)	26 (25.2)	8 (3.7)	
	≥36 (Handicapping)	26 (25.2)	0 (0.0)	

$p < 0.05$; *Statistically significant

children. Almost 50% of handicapped children had severe to very severe malocclusion whereas very few from control group had the same problem. More number of children from handicapped group were in need of mandatory orthodontic treatment (Table 1).

DISCUSSION

Literature on the dental management of handicapped subjects is scarce compared with that of the normal child.

The WHO classified the mean DMFT of 12-year-old children in worldwide into four categories: Very low < 1.2, low 1.2 to 2.6, moderate 2.7 to 4.4, and high 4.4.[15]

The overall prevalence of dental caries among the handicapped children was 77.0%, the mean DMFT for the handicapped children and healthy control subjects was 1.7 and 1.4 respectively. This level of dental caries is considered low according to the WHO classification. These findings are in agreement with other regional and international studies which reported lower caries prevalence in special-care children.[16-18]

This investigation showed that there were few differences in caries prevalence between handicapped and control children although the risk for dental caries can be expected to be higher in these patients due to difficulties in oral hygiene maintenance. The nature of the handicap seemed to have a definite effect upon the prevalence of oral disease in the handicapped children included in the study which was probably due to local factors. One major factor contributing to this may be the dietary control in the Institute they live in. As major factors causing dental caries are taken care of and due to improved oral hygiene, caries prevalence was almost equal to normal children.[19-25]

These results indicate that both the groups were in almost equal need for treatment, mainly one/two surface restoration with very few in the need of extraction or pulp therapy. These results were in contrast with various studies in which this unique group of patients with high prevalence of dental caries and more treatment need compared with healthy patients.[26,27]

In a study by Gizani et al,[28] 7.9% of noninstitutionalized handicapped children had sealants placed. In our study, none of the children had sealants. The factors responsible for so much unmet treatment need might be low priority given to dental care in the society, lack of facilities for regular oral health checkup and prompt treatment, poor socioeconomic status of the parents and guardians, and cost of treatment.

Although the DMFT score is less but the prevalence is high (90%), steps must be taken to further reduce the caries prevalence in special group children. Increased oral health promotion for parents and caretakers both at pre-school and primary school stage to enable them to implement effective preventive regimes for their children. Oral health education program should focus on control of sugary foods and drinks in the diet, improving oral hygiene, use of various fluoride regimes and regular follow-up by the dentist for advice and care. Any health promotion strategy for these children must include improving access to dental care and encouraging uptake of dental services.

The DAI index is a well-known epidemiologic tool that combines a single mathematic score of esthetic and physical aspects of malocclusion. Its assessment of the 10 occlusal traits provides more clinical information than indices based on a single worst feature. Keay et al[29] stated that the DAI has high sensitivity and correctly predicts a high proportion of persons requiring orthodontic treatment. Furthermore, the index also has high negative predicting power, where the no-treatment need recommended by the DAI is likely to be correct.

As observed in our study, there was significant difference in prevalence of malocclusion between handicapped and control group which was in accordance with the various other studies done on special group children.[9,30-32] Overall, subjects with handicapped condition appeared to exhibit a high prevalence of severe to very severe malocclusion. This indicates that the need for orthodontic treatment is highly desirable and mandatory for this group.[31,33]

It is observed that children with higher orthodontic treatment need perceived more negative psychosocial impacts and hence a worse quality of life compared with a group of individuals with no or minimal malocclusion.[34,35]

Many handicapped children have orthodontic problems because of skeletal or muscle abnormalities, along with this, oral destructive habits like mouth-breathing, tongue-thrusting, or thumb/finger-sucking that are referred to as "psychological" or "environmental", usually produce dental arch malformations.

Obviously, the cooperation from the patient is important in the treatment of a severe skeletal malocclusion. Often a well-timed extraction program will produce an acceptable occlusion without any other therapy or with the additional use of a very simple appliance. So it is important to evaluate the dental arch development at regular intervals at early age so that long-term program can be prepared and explained to the caretakers and parents.

The treatment objectives for handicapped should be as comprehensive as possible but may need to be adapted to each individual's condition. Regardless of behavioral, medical, and dental conditions, orthodontic treatment can be performed in these patients. Most children with disabilities perceive dental treatment with exaggerated levels of apprehension, far more than other orthodontic patients. Hence, they must be approached with understanding and compassion to gain their trust.

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