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RESEARCH ARTICLE

ORAL HYGIENE AND DENTAL CARIES STATUS OF SENSORY IMPAIRED CHILDREN IN KASHMIR – A CROSS SECTIONAL DESCRIPTIVE STUDY

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ABSTRACT

Oral health is a vital component of overall health, which contributes to each individual's wellbeing and quality of life by positively affecting physical and mental healthiness, appearance and interpersonal relations. Individuals with special needs have greater limitations in oral hygiene performance due to their potential motor, sensory and intellectual disabilities and are thus, prone to poor oral health. The present study was planned to determine the prevalence of dental caries, oral hygiene, malocclusion and traumatic injuries in sensory impaired children. A total of 104 children, within the age group of 5-16 years attending special Deaf and Dumb school in Tulsibagh, Srinagar, Jammu and Kashmir were included in the present study. Prior to the examination of children a written formal permission was taken from the administrative authorities of the selected school. A type III examination was carried out, DMFT index was used in the permanent teeth while for the primary teeth the 'deft' index was used. Oral hygiene Index-Simplified was used for assessment of oral hygiene status. The mean deft in the blind population was 2.51 and mean DMFT was 2.64, while in the deaf/dumb group mean deft was 2.17 and mean DMFT was 2.20. Caries prevalence in group A (blind) was found to be higher (78%) as compared to the deaf/dumb (72 %). The oral hygiene of the blind group (4.22) showed higher OHI-S score showing that this group had poor oral hygiene as compared to the deaf / dumb group (3.81). Trauma was more common in blind group. It can be concluded that the prevalence of dental diseases especially dental caries plaque and debris is slightly high that seen in the normal children (60-70%) and that there is a need for administration of proper professional dental treatment in these children.

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INTRODUCTION

Oral health maintenance is very important for healthy life. Simple practices like brushing of teeth daily regularly and eating normal nutritive balanced food, periodic dental checkups once in every six months is the basic need to enjoy good oral health for every person. Neglect of these factors will lead to dental problems like Dental caries, periodontal disease, malocclusion, etc., even in normal individuals. In case of persons with disabilities these dental problems becomes severe if neglected. The 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. (Altun *et al*., 2010) Blindness is defined by WHO as having a 'visual acuity of less than 3/60m or corresponding visual field loss in the better eye with the best possible correction.' meaning that whilst a blind person could see three metres, a non-visually impaired person could see 60 meters. Visual impairment relates to a person's eyesight which cannot be corrected to normal vision. (Azriana *et al*., 2007) According to the National Sample Survey Organization (NSSO) India in 2002, 0.4% of 1065.40 million children (Census, 2002) suffered from hearing impairment. According to a WHO 1980 report, the main causes of hearing impairment in India were 1) infections such as bacterial meningitis, mumps, and measles, 2) neglect, and 3) ignorance. Three levels of prevention of hearing impairment were also documented: 1) Primary, 2) Secondary, and 3) Tertiary. (Nandini, 2003) As per census 2001, there are about 21 million people with disability in India. (Nandini, 2003) It is believed that the number of handicapped individuals is increasing in proportion to the general population. Oral health is a vital component of overall health, which contributes to each individuals wellbeing and quality of life by positively affecting physical and mental healthiness, appearance and interpersonal relations. (Rao *et al*., 2005)

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Individuals with special needs have greater limitations in oral hygiene performance due to their potential motor, sensory and intellectual disabilities and are thus, prone to poor oral health. (Graber, 1963) If timely dental treatment not given the dental health deteriorates and may add up to the already existing disability, hence sincere attempt should be made by professionals to highlight these aspects and bring it to the knowledge of parents to seek dental care to their children regularly by competent dental professionals. Disabilities affect the mind, the body, and the skills people use in everyday life: thinking, talking, and self-care. People with disabilities often need extra help to achieve and maintain good health. Several reports have been documented in literature regarding the dental status in disabled children. (Altun *et al*., 2010; Nandini 2003; Vignehsa *et al*., 1991; Zehaati *et al*., 2006) The present study was planned to determine the prevalence of dental caries, oral hygiene, malocclusion and traumatic injuries in sensory impaired children.

MATERIALS AND METHODS

A total of 104 children, within the age group of 5-16 years attending special Deaf and Dumb school in Tulsibagh, Srinagar, Jammu and Kashmir were included in the present study. The inclusion criteria for the study were: a) children with either one of the following sensory impairments, blindness, deafness and inability to speak, b) children between the age group of 5-16 years of age and c) children free from any other form of mental handicap. This study was done in a single school as this was the only school of the kind present in the area. Prior to the examination of children a written formal permission was taken from the administrative authorities of the selected school. The parents of the subjects were also contacted via a letter which was duly signed by the parents or guardians prior to taking a student in the study. The Research protocol of the study was approved by the Institutional Reviews Committee. The school selected, centered towards education and rehabilitation of sensory impaired children. Out of the entire sample, 55 (Group A) were blind subjects and, 46 (Group B) were deaf/dumb and 3 students were having both these disabilities. The data for these three subjects was not tabulated. Demographic information regarding the age, school and the residential address was collected from the schools register and information Centre. A type III examination was carried out and children were examined in the school using natural day light and sterilized instruments with participants seated on an ordinary chair with a head rest. The findings were recorded on a specially designed oral health assessment form. For assessment of caries the DMFT (Klein *et al*., 1938) index was used in the permanent teeth while for the primary teeth the 'deft' (Allen, 1944) index was used. The oral hygiene status was assessed using the Oral hygiene Index-Simplified. (Greene and Vermillion, 1964) For determining malocclusion 4 sub-categories were selected, these were a) spacing, b) crowding, c) cross bite and d) increased over jet and f) any other. For anterior tooth trauma the presence or absence of the trauma was noted as given in the oral health assessment form. After the examination a dental health education class was held for the students, teachers and the care givers so that the children could be educated with regards to maintaining their oral health and hygiene. A special class was arranged for the deaf students where a school teacher performed the role of educating these students by their cognitive methods. The data was entered into an Excel Sheet database (MS Office Excel 2000; Microsoft Corporation, Redmond, WA, USA). The total data was distributed meaningfully and presented as individual tables along with graphs. The statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 15.0 statistical Analysis Software. The values were represented in numbers and percentages (%) and mean ±SD. t-test was used for the comparison of means. The level of significance was set at $P < 0.05$.

RESULTS

The total sample comprised of 104 subjects. Out of which 52.8 % (55) were blind, while 44.2% (46) were deaf and 3 had both the conditions, with an age range of 5-16 years. The mean deft in the blind population was 2.51 and mean DMFT was 2.64, while in the deaf/dumb group mean deft was 2.17 and mean DMFT was 2.20 (Table 1). Caries prevalence in group A (blind) was found to be higher (78%) as compared to the deaf/dumb (72 %). There was a significant difference in the dmft (primary dentition in between the two groups ($p = 0.001$) while there was no statistically significant difference in between the DMFT (Permanent Dentition). The oral hygiene of the blind group (4.22) showed higher OHI-S score showing that this group had poor oral hygiene as compared to the deaf / dumb group (3.81) (Table 2).

The mean debris scores for the blind group was 1.91±0.73 which was higher than the deaf/dumb group who had a mean score of 1.82±0.64. Similarly, the calculus scores for group 1 was 2.31± 0.88 which was higher than the deaf/dumb group who had a mean score of 1.99±0.63. The results also showed that trauma was more common in blind group (51.3%) as compared to the deaf/dumb group (Table 4). The results about malocclusion between the two groups didn't show any major differences in the two groups (Table 4).

Table 1. Mean caries experience and prevalence of blind and deaf/dumb groups

Disability	Mean 'deft'	Mean 'DMFT'	% prevalence
Blind (n =55)	2.51	2.64	78%
Deaf /Dumb (n =46)	2.17	2.20	72%

Table 2. Mean (±SD) dental caries experience, tooth wise and surface wise, in primary and permanent dentition of blind and deaf/dumb groups

Variables	Blind		Deaf/Dumb		t-value	p –value
	Mean	Std.Dev.	Mean	Std.Dev.		
dmft	2.51	2.14	2.17	1.44	3.450	0.001
dmfs	3.98	5.70	4.84	3.62	1.836	0.068
DMFT	2.64	1.62	2.20	2.01	1.530	0.128
DMFS	3.55	6.76	3.72	3.65	1.415	0.159

Table 3. Mean (±SD) Oral hygiene scores of blind and deaf/dumb groups

		Blind		Deaf /Dumb		t –value	p –value
		Mean	SD	Mean	SD		
Oral Hygiene	Debris Index [DI-S]	1.91	0.73	1.82	0.64	0.238	0.812
	Calculus Index [CI-S]	2.31	0.88	1.99	0.63	2.019	0.044*
	OHI-S	4.22	1.17	3.81	1.27	1.268	0.205

Table 4. Prevalence of orthodontic condition and traumatic injuries to teeth in blind and deaf/dumb groups

		Blind	Deaf /Dumb
Trauma	Present	51.3%	34.7%
	Absent	48.7%	65.3%
Orthodontic Problems	Crowding/Spacing*	39.45	41.6%
	Cross Bite*	9.1%	7.8%
	Increased Over jet*	22%	21.6%

DISCUSSION

The total sample comprised of 104 subjects. Out of which 52.8 % (55) were blind, while 44.2% (46) were deaf and 3 had both the conditions, with an age range of 5-16 years the data for these subjects was not tabulated for purpose of easing the results. This study was done in a single institute as this was the only available and accessible school fir the sensory handicapped children available in the state. The main purpose of this study was to assess. The caries and oral hygiene status of the sensory impaired children both deaf/dumb and blind children. Good health is a fundamental goal for people and the societies in which they live. (Vyas and Damle, 1991) It has been stressed previously that oral health is the mirror of general health. (White *et al.,* 1998) The etiology of dental caries may be considered as a conflict between factors conducive to tooth decay and factors promoting resistance to the disease, each of these opposing forces being susceptible to environmental influences. People with such physical and intellectual disabilities (PID) form a group the special needs population.(Vignehsa *et al*., 1991) They have restricted ability to be supporters of their health and little is known about their oral health, also they experience considerably higher levels of oral disease and have extra barriers to accessing health and dental care services.(Pradhan *et al*., 2009) In the present study we found the mean DMFT in the blind was2.64±1.62 while that in the deaf/mute to be 2.20±2.01, showing that blind children had higher level of dental caries. Previously Gupta *et al* reported mean DMFT of 4.85 in the blind children while in the same study he has reported a mean DMFT of 4.02 in deaf/mute. (Gupta *et al.,* 1993) A study conducted by Ivanci´c. *et al*. in 80 disabled children in the 3-17-year age group in Rijeka, Croatia, showed a mean DMFT of 6.39 in permanent dentition, whereas in our study it was much lesser. (Ivanci´c *et al*., 2007) In the present study the level of dental caries seen was lesser than these previous findings. This difference could be attributed to the dietary consumptions and the oral hygiene maintenance. For the assessment of dental caries decayed, missing, and filled teeth (DMFT) index has been used as it is one of the most commonly used caries index and has been often used in various epidemiological studies to measure the degree of caries experience of subjects with primary as well as permanent dentition. 15. In the present study the prevalence of dental caries was higher in the deaf/mute (78 %) whereas that in the blind (72%) which is similar to a previous study done in similar population. (Gupta *et al*., 1993)

The status of oral hygiene was determined using the Oral hygiene Index – Simplified. In the present study we found a comparatively high prevalence of poor periodontal and gingival health in the blind at with mean OHI-S 4.22±1.17 as compared with the deaf who had mean OHI-S 3.18±1.27. Poorer oral hygiene and gingival health in the studied children are consistent with the findings of other studies also, which can be attributed to environmental, systemic and local factors. (Tesini 1981; Ajami *et al*., 2007) Other than this, these children are sensory impaired which could be a possible explanation of their deteriorated oral health. Similar reports can be seen in the previous literature as done by Brown and Schodel reviewed 32 studies of deaf/mute children and reported that such children tended to have poorer oral hygiene than their normal counterparts. (Brown and Schodel, 1976) The majority of the study population presented poor oral hygiene. There were no subjects with good score. This may also be attributed to their sensory impairment as children with special needs might be poor in cognition and using a proper method of oral hygiene maintenance. In the present study we found the prevalence of traumatic injuries to teeth in the blind to be higher as that found in the deaf children. In the blind children we found a prevalence of 51.3%, and in the deaf it was, 34.7%. Children who are blind are at greatest risk for traumatic injury due to their compromised vision. This difference could be attributed to a size of the sample and variation in the area where the study was carried out. Hearing impaired children have more opportunities to play and move around and do physical work as compared to non-sighted or blind children (AlSarheed *et al*., 2003). In our study we found that amongst the blind children 39.45% had crowding/spacing, 9.1% had cross bite, 22% had over jet >2mm. Similarly, in deaf/mute children the prevalence was 41.6%, 7.8% and 21.6% in respective categories. The possible explanation for this could be that deaf/mute appear to have a less flexible tongue during speech production than other children who don't have such problems. 24. This difference could disrupt tongue function similar to having abnormal habits. With changes in the tongue, cheek, and lip muscle functions, the overall effect is a significant narrowing of the maxillary arch, similar to that of open mouth syndrome or mouth breathing subjects. (Gross *et al.,* 1994) Oral hygiene maintenance is essential to good oral health. In the prevention of dental caries, brushing of the teeth and other aids to oral hygiene are effective to control the accumulation and retention of plaque. Brushing of the teeth, supplemented by appropriate methods of interdental cleansing, can be effective in individuals who are motivated and able to follow a strict, careful, and efficient regime. In dentistry, a key health promotion tool used is oral hygiene instruction. These instructions are to be demonstrated to the children or the masses as per their cognition and reception powers. Oral hygiene instruction is especially important for prevention and treatment of oral conditions in children as it provides basis for good oral health throughout life. For the sensory impaired children specialized school teachers need to be aught or educated about oral hygiene maintenance so that proper knowledge can be infused in these special need children. Oral hygiene instruction should include an explanation of the purpose of oral hygiene and demonstrations of tooth brushing and interdental cleaning.

Conclusion

In conclusion, the prevalence of dental caries was more in the blind children as compared to the deaf/mute children. Furthermore, poor oral hygiene conditions were more prevalent in blind children than the deaf/mute. It can be concluded that the prevalence of dental diseases especially dental caries plaque and debris is slightly high that seen in the normal children (60-70%) and that there is a need for administration of proper professional dental treatment in these children. It shall also be stressed that such institutes or schools which harbor sensory impaired children shall be adopted by

the accessible Dental hospitals within the geographic region so that these children can be benefitted by a proper oral health care.

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