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Research Article

Prevalence of Dental Caries among Institutionalized Visually Impaired Children and Adults Aged 6 - 25 yrs in Delhi

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Abstract

Aim: The aim of the study was to assess the prevalence of dental caries in visually impaired children and adults aged 6-25yrs attending special schools in Delhi.

Materials and Methods: A total number of 1131 visually impaired individuals studying in various special care institutions in Delhi were examined. Extra-oral as well as intra-oral examinations were carried out and Decayed-Missing-Filled Teeth (DMFT) Index and decayed-extracted-filled teeth (deft) Index was used. The relevant findings were entered in the proforma.

Results: It was seen that out of a total of 285 students in the mixed dentition group, 77 individuals had dental caries constituting 27.02%; whereas in the other group, out of a total of 1131; 575 individuals presented with DMFT scores constituting 50.84%. On the whole, it was noted that 44.3% of the individuals were caries free in both the groups.

Conclusion: The DMFT index showed a cumulative increase with age. As age advanced, the incidence increased. Dental caries prevalence was more in males as compared to females.

Keywords: Dental Caries; Visually Impaired; Children and Adults; Institutionalized; Special Children

Introduction

Dental caries is the most common oral disease, which is prevalent all over the world and rapidly emerging oral health problem amongst the children of India. Its incidence in different states varies between 31 and 89%. According to National Oral Health Survey, caries prevalence in India was 51.9, 53.8 and 63.1% at ages 5, 12 and 15 years, respectively. In the absence of baseline data, the exact magnitude of the oral health problems is seldom recognized in India; as a result oral health always remains a low priority area in the government programs. Therefore, in developing countries such as India, this is quite a serious yet one of the most neglected problem [1].

Dental plaque deposited over the tooth surface is the main causative factor. Conventional methods for teaching oral hygiene involve the use of visual perception, using disclosing agents to visualize the plaque and tooth brushing to remove it and re-disclosing periodically to monitor their improvement of oral hygiene status. Unfortunately, none of these measures are beneficial to visually impaired children who depend much more on feeling and hearing to learn.

The main factor of differentiation between normal patients and blind ones is the difficulty in removing plaque. The visually impaired people are at a greater risk to develop caries, since they are unable to see the early signs of caries such as discoloration which indicates the initiation of the disease process. In order to prevent the disease, our main concern is to reduce plaque deposition on the tooth surface by different means. Oral health education has been shown to have a positive impact in lowering plaque scores.

Objective of the Study

The objective of the study was to assess the prevalence of dental caries among the institutionalized visually impaired children and adults in Delhi.

Materials and Methodology

A total number of 1131 visually impaired individuals in the age group of 6 - 25 yrs with 100% bilateral blindness were included in the study. A self-administered close-ended questionnaire written in English, prepared in the Department of Paedodontics and Preventive Dentistry, Sudha Rustagi College of Dental Sciences and Research, Faridabad was prepared to record the information.

The principal investigator was trained and calibrated under the guidance of the chief supervisor before proceeding for the study till consistent results were obtained. This was done to avoid intra examiner variability. The responses for the close ended questionnaire were recorded with the help of the guardians or the class teachers who were used as co-coordinators for the study. The interview was followed by the clinical examination of children by the calibrated examiner. Type III clinical examination was carried out inside the school premises using mouth mirror and explorer by a single examiner. Extra-oral as well as intra-oral examinations were carried out. Teeth were examined for Dental Caries using the Decayed-Missing-Filled Teeth (DMFT) Index given by Henry T Klein, Carrole E Palmer and Knutson JW in 1938 [2] and decayed-extracted-filled teeth (deft) Index given by Gruebbel AO in 1944 [3]. The relevant findings were entered in the proforma.

After a thorough extra-oral and intra-oral examination, for those children needing treatment-oral prophylaxis and ART was performed. Clinical findings of the individuals were reported to the class teachers at the end of the examination. Reference slips were forwarded to the parents or guardians of the individuals through their class teachers for information and necessary action.

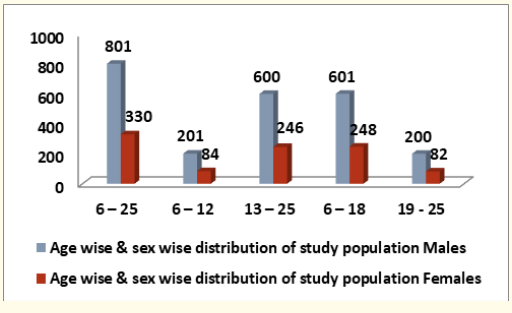
Data analysis

All the data obtained was punched using Microsoft excel. The same sample was divided accordingly into two different groups: Mixed dentition (6 - 12 yrs) and permanent dentition (13 - 25 yrs) (Category A).

Mann-Whitney U test was used to compare the categorical variables (age and gender). Statistical significance was fixed at $P \leq 0.05$.

Results

Among the different groups, majority of the individuals were males (Graph 1) and belonged to the permanent dentition category.



Graph 1

The mean DMFT scores in the age group of 6 - 12 years (mixed dentition) were 0.44 and that in the age group of 13 - 25 years (permanent dentition) was 1.57. This difference is statistically significant ($p < 0.001$) stating that dental caries is higher among the individuals with permanent dentition while the mean deft score observed was 0.65 (Table 1).

Age (Years)	DMFT (mean ± SD)	P[a] value (significance)	deft (mean ± SD)
6 - 12	0.44 ± 0.90	< 0.001, S	0.65 ± 1.26
13 - 25	1.57 ± 1.73		0

Table 1: Age wise distribution of dental caries (DMFT and deft) in mixed and permanent dentition.

Out of a total of 285 subjects in this group; 201 were males and the remaining were females. The difference in the mean DMFT and deft scores were non-significant (Table 2).

Gender	Total	DMFT	P[a] value (significance)	deft	P[a] value (significance)
		Mean ± SD		Mean ± SD	
Males	201	0.48 ± 0.96	0.512, NS	0.72 ± 1.33	0.137, NS
Females	84	0.35 ± 0.74		0.46 ± 1.06	

Table 2: Gender wise distribution of dental caries (DMFT & deft) in mixed dentition (6 - 12 years).

Among 846 students in the permanent dentition, 600 were males and 246 were females. There was statistical significant difference observed ($p = 0.018$) among the males and females. Males presented with higher DMFT scores as compared to females (Table 3).

Gender	Total	DMFT	P[a] value (significance)
		Mean ± SD	
Males	600	1.86 ± 1.72	0.018, S
Females	246	1.76 ± 1.73	

Table 3: Gender wise distribution of dental caries (DMFT) in permanent dentition (13 - 25 years).

The prevalence of dental caries among the 2 groups was found to be 27.02% among the mixed dentition and 50.84 among the permanent dentition group (Table 4).

Mixed Dentition	Total	n	%
With dental caries	285	77	27.02
Dental caries free		208	72.98
Permanent Dentition			
With dental caries	1131	575	50.84
Dental caries free		556	49.1
Overall			
With dental caries	1131	630	55.7
Dental caries free		501	44.3

Table 4: Dental caries prevalence.

Discussion

The present study reveals the mean DMFT score of 1.29 and deft score of 0.65. 50.84% of individuals had caries in the permanent dentition and 27.02% had decay in the primary dentition. This was considered similar to a study conducted by Prashanth., *et al.* [4] where, 69.4% of children had dental caries in deciduous dentition and 35.2% of children had dental caries in permanent dentition. The higher caries rate among these individuals could be due to the frequent consumption of sweets and in between snacking as reported by their care providers. This could be due to the exposure of these individuals to a different living environment that includes various factors such as socio-economic status, peer influence, illiteracy and lack of awareness towards oral health among the parents, which might have encouraged the frequent consumption of refined sugars resulting in a higher DMFT before their admission to the special care institutions.

However, the D and the d components accounted for a higher proportion of the total DMFT and dft respectively. The trends in this study are similar to those found in other studies [5]. Shetty V., *et al.* [6] which may indicate that the unmet treatment need was large with very few individuals having been treated by a dentist, a high demand for provision of dental services still remains.

Conversely, previous studies on children with disabilities or with special health care needs found higher percentages of caries-free participants than in our study (44.3%). In the studies by Ajami., *et al.* (2007) and Cokpekin., *et al.* (2003), the caries-free percentages were 81.7% and 42%, respectively [7]. On a global level, the proportion of caries-free children (53.2%) in a study done by Tagelsir A, Khogli AE., *et al.* [8] was higher than those reported from comparable population in Turkey (26.4%), India (1.5%) and Kuwait (35.5%). Differences in the proportion of caries-free children could be attributed to differences in dietary patterns and accessibility to sweet snacks of these populations. Visually impaired children have more difficulties in performing oral health care measures than do children with other types of disabilities, because visual ability plays an important role in oral health care. This could explain the lower percentage of caries- free children in our study. Moreover, a recent study in 2012 by Bekiroglu., *et al.* revealed no significant association between the degree of blindness and their caries experience [9].

In a study conducted by Singh N., *et al.* [10] the mean deft was 1.44 and mean DMFT was 1.52 in blind children. In a study conducted by Naveen N [11] the mean deft was 1.45 and the mean DMFT was 1.13. In another study conducted by Doshi JJ., *et al.* [12], the mean deft score was 1.45 and DMFT was 1.0 in blind children. The authors summarized the increased caries prevalence which demonstrates the extensive unmet needs for dental treatment in the visually impaired together with their non-prioritization.

An increase in caries prevalence and severity with increasing age is attributed to the irreversibility and accumulative nature of the disease with age. This is well observed in the current study. The mean DMFT score among the mixed dentition group was 0.44 which increased to 1.57 in the permanent dentition group.

Maciel MAS., *et al.* [13] quoted the increased rates of DMFT in children and adolescents, and especially in young adults, which are consistent with the data from SB Brazil 2003 indicating that 70% of Brazilian children at 12 years of age and about 90% of adolescents aged 15 to 19 have at least one tooth with caries.

Also, males exhibited high DMFT and deft scores as compared to the females. The reason could be attributed to the lack of maintenance of oral hygiene among the male population. This is agreed in the study done by Solanki J., *et al.* [14]; when DMFT indices were examined with regard to sex, the mean DMFT was found to be higher for males.

Though various studies on the prevalence of dental caries of the normal population have been carried out in the past, only limited studies have been done comparing dental health of different kinds of Special Care children more so for the visually impaired children and adults in the city of Delhi. This will be helpful in obtaining baseline data to understand their oral health needs and accordingly recommending appropriate preventive measures.

Conclusion

The following conclusions were drawn from the study:

a. The overall dental caries prevalence was 55.7%, out of which 27.02% individuals had dental caries in the primary dentition with a mean deft score of 0.65 and 50.84% individuals presented with dental caries in the permanent dentition with a mean DMFT score of 1.29.

b. The DMFT index showed a cumulative increase with age. As age advanced, the incidence increased.

c. Dental caries prevalence was more in males as compared to females. This was significant in the permanent dentition but not in the mixed dentition group.

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