

Prevalence and Severity of Dental Caries and Dental Fluorosis in Jamshedpur School Children

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ABSTRACT

Aim: Mortality has been plagued by the presence of caries, the unique disease ever since prehistoric times. Fluoride can be considered as “double edged sword” in oral health, optimal levels of which can be cariostatic but at levels above optimum can be detrimental. The knowledge of the prevalence of dental caries and fluorosis will help in the formulation of better preventive protocols. The present study aimed to find out the correlation between prevalence and severity of dental caries and prevalence of dental fluorosis.

Methods and Material: A survey proforma was prepared with the help of World Health organization (WHO) oral health assessment form on 1511 school going children of Davangere in the age of 5-6 years. The examination for dental caries was made according to Decayed Missing Filled (DMF) Index. The examination for dental fluorosis was made according to Deans Fluorosis Index.

Statistical analysis used: WHO oral health assessment form was used to prepare the survey proforma and the DMF index was used to measure dental caries. Deans Fluorosis Index was used to measure dental fluorosis. The results thus obtained were statistically analyzed.

Results: Significant difference ($P < 0.5$) in caries prevalence was observed between the fluorosis affected children and the children who were not affected with fluorosis. Statistically significant difference ($P < 0.01$) in caries prevalence was observed between the fluorosis free group and fluorosis affected group. Low caries prevalence was observed in children who had questionable fluorosis.

Conclusions: A highly significant correlation was observed between caries prevalence and age with females showing higher prevalence. Educated mother's children were less susceptible to dental caries.

Keywords: Caries, Correlation, Prevalence, School children, Fluorosis.

INTRODUCTION

Fifty years ago in USA, when fluoride was first added to public water supplies for the purpose of controlling dental decay, fluoride-containing drinking water was the only significant source of

fluoride exposure. Dental caries and its consequences, together constitute a very real and personal problem for almost every man, woman and child. Dental caries is probably the most prevalent of all diseases of childhood with its life-long sequel in dentistry. Oral hygiene maintenance plays a

Received: Nov. 1, 2019; Accepted: Dec. 22, 2019

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major role in caries prevention and we all know that "Prevention Is Better Than Cure".

In recent years, the global distribution of dental caries presented a varied picture. However, in several industrial countries a reduction of dental caries incidence is evident. This decline in dental caries was mainly due to appropriate use of fluoride in different forms viz, dentifrices, mouth rinses, topical fluorides, fluoride tablets and proper oral hygiene measures.

Numerous local and national studies have demonstrated a substantial decline in caries prevalence in the United States over the past several decades. Fluoride is considered to have played a major role in these reductions. At the same time, the prevalence of dental fluorosis, which is caused by excess fluoride intake during the period of preemptive tooth formation, also has increased over the decades since the start of water fluoridation

Fluoride ingestion at optimal levels during tooth development results in formation of dental enamel that is more resistant to caries. Fluorotic enamel has an altered structure, composition and appearance that becomes more severe as the amount and duration of fluoride ingestion increases.

The effect of fluoride on the dentition is dose-dependent and is not confined to increased caries resistance. If accumulated above certain levels in the body fluoride causes various disorders together called as FLUOROSIS.

Dental Fluorosis, as it affects the esthetics and in some cases function too, is a problem at grave concern to the society at large¹. Therefore, the knowledge of the prevalence of dental caries and dental fluorosis will help in the formulation of better preventive protocols

Table 1: Correlation between prevalence and severity of dental caries and dental fluorosis.

	Total Children with florosis	Caries		Caries Prevalence	X ²	P - Value
		Present	Absent			
Present	448	300	148	66.8	7.01	<0.05
absent	1100	792	308	72.7		
Total	1548	1092	456			

MATERIALS AND METHODS

Total of 1548 school going children were involved in this study. This research work was reviewed by the institutional review board committee and approved. The subjects belonged to a age group of 5 to 13 years. A survey Performa was prepared with the help of WHO oral health assessment form (1997)⁽²⁾.

Sufficient numbers of instruments were made available and sterilized to avoid the need to interrupt examinations. The examination of dental caries was made according to DMF index. For convenience, the following colour coding was used:

RED-caries, BLUE-filled, BLACK-missing.

The examination for dental fluorosis was recorded as per Deans Fluorosis Index (1942)⁽³⁾. Recording procedure was standardized by repeated sessions of calibration between investigator and chief supervisor. In order to minimize intra-examiner variability, 10% of the individuals recorded in the study were randomly selected at the end of each day, re-examined and result compared to keep constant check on recording.

Immediately after the survey, health talk was given in local language. Visual aids (models, charts etc) were also used in motivating children. Survey findings were reported to respective school authorities on the spot or next day. Children who

were requiring treatment were referred to College of Dental Sciences, Davangere.

The data was transferred from pre-coded survey proforma to a computer. A master file was created and later the data was subjected to statistical analysis.

RESULTS

The study population consisted of 1511 school going children of 5-6 years and 12-13 years age groups.

The data collected was analyzed and showed the following observations. Total of 1548 children participated in this study. Total number of children with fluorosis was found to be 448 and without fluorosis was 1100. Out of 448 subjects, 300 showed the presence of caries and in remaining 148 there were no caries. In children who do not presented with fluorosis, 792 showed the presence of dental caries and the remaining 308 showed the absence of caries.

The caries prevalence in the children with fluorosis was 66.8% whereas the prevalence of dental caries in children who lacked fluorosis was 72.7%. Significant difference ($P < 0.5$) in caries prevalence was observed between the fluorosis affected children and the children who were not affected with fluorosis.

DISCUSSION

Dental caries, because of its omnipresent nature remains one of the most prevalent diseases of menfolk. It is supposed to be increasing due to our habit of eating refined food⁴. It is one of the common ailments and has been called "the last epidemic"⁵. In the fight against dental caries, the greatest armament that a dentists have is in the form of fluoride⁶. However, dental caries is a multifactorial disease and the effect of fluoride depends upon many parameters.

Five to six year of the age have been chosen for this study because of interest in relation to levels of dental caries in the primary dentition which may exhibit changes over a shorter time span than the permanent dentition at other index ages.

Maximum age of thirteen years was chosen because this age is especially important as it is generally the age at which children leave primary school, and therefore in many countries, is the last age at which a reliable sample may be obtained easily through the school system. Also, it is likely at this age that all permanent teeth, except third molars, will have erupted.

Decayed-missing-filled index was introduced by Henry Klein, Carrole E. Palmer and Knutson J Win 1938⁷. DMF/dmf index is most universally employed index for measuring dental caries. DMF/dmf index is an irreversible index. So it measures total life time caries experience⁸. This DMF/dmf index was present in W.H.O oral health survey form: basic data(1971)⁹. Hence DMF/dmf index has been used in the present study to know the prevalence of dental caries.

Dean's fluorosis index was introduced by Trendly H. Dean in 1934⁽¹⁰⁾. Dean introduced version of his fluorosis index in 1942³. This classification system is the most widely adopted for classifying dental fluorosis in use since 1942⁸. Dean's Fluorosis index was present in the W.H.O oral health assessment form(1997)². Hence, Dean's fluorosis index has been used in the present study to know the prevalence of dental fluorosis.

Prevalence of dental caries for entire population was 72.7%. Similar findings were observed by Tewari A et al (1977)¹¹, Gupta et al (1987)¹² and Juarez-Lopez ML et al(2003)¹³. The isolated surveys of dental caries by different authors reveal the prevalence between the 48.2 – 72.35% (Misra FM, 1979)¹⁴. Ramachandran & Rajan (1973)⁽¹⁵⁾ noted an average caries prevalence of 66.2% in urban areas of South India

The prevalence of dental fluorosis in the population was found to be 32%. It has been reported that during the 1980s, the mean population of dental fluorosis was 23% in optimally fluoridated community and 10% in low fluoride community¹. During the 1990s, the prevalence of dental fluorosis has been reported to be between 17% and 69% in optimally fluoridated community (Ismail AI et al 1993)¹⁶.

A significant correlation between the prevalence of dental caries and dental fluorosis was

observed in the present study. Similarly a positive correlation was also seen in the study done by Menon A and Indushekar KR⁶ and Juarez-Lopez M et al⁽¹³⁾. Eklund SA¹⁷ showed less caries in Fluorotic teeth independent of fluoride in drinking water. Also, similar results were seen in studies conducted by Shekar C, Cheluvaiiah MB and NamileD¹⁸, Sukhabogi JR et al¹⁹ Wondwossen F et al²⁰. However, Grobler et al (1986)²¹ has reported that no significant correlation could be demonstrated between the fluorosis score and DMFS index in children from the nearly optimal and high fluoride area.

SUMMARY AND CONCLUSION

The conclusions drawn from this study are as; The dental caries prevalence was low in the fluorosis affected children when compared to fluorosis free and Least dental caries prevalence was seen in the children who had questionable fluorosis.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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