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Dental Caries in relation to brushing frequency, type of toothpaste used and sweets consumption frequency among 5 & 12 year old Children: An Epidemiological Study

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ABSTRACT

Aim: Dental caries prevalence determination among 5 and 12 year old children in relation to brushing frequency, type of toothpaste used and sweets consumption frequency.

Materials and Methods: A cross sectional study was conducted to determine prevalence of dental caries among 5 and 12 year old children in relation to brushing frequency, type of toothpaste used and sweets consumption frequency. 502 children participated in the study out of which 219 belonged to 5 year and 283 belonged to 12 year old children.

Results: Dental caries prevalence was found to be higher in children of 5 years of age (63.6%) than that of 12 years (53.6%) (p = 0.001). Mean DMFT was 2.47 ± 2.75 for 5-year-old children and 1.18 ± 1.33 for 12-year-old children. Decayed teeth prevalence was significantly more among children with no brushing (92.9%) and 2-3 times a month (100%) as compared to those who brush daily (57.9%) or twice a day (55.2%) (p=0.039). Decayed teeth was significantly more among children without fluoride containing toothpaste in comparison to children with fluoride containing toothpaste (p=0.028). The prevalence of decayed teeth was significantly more among children with sweets between meals comparison to children without Sweets between meals (p=0.010).

Conclusion: This study thus gives a brief insight into the dental caries in relation to various factors among 5 and 12 year old children. Besides, this is an important period for instituting preventing programmes because as the teeth erupt, bacteria colonize tooth surfaces and dental behavior starts to develop during this time. It is however important to carry out an in-depth screening survey on a larger population to draw definite conclusions about dental caries.

Keywords: Frequency, Sweets, Toothbrush, Toothpaste

I. INTRODUCTION

The World Health Organization (WHO) evaluates the influence of various risk factors on health and pays great attention to monitoring of oral health status and its worsening because these factors can cause worse quality of life and overall health.[1] Dental pain has been used to explore the impact of pain on the psychosocial wellbeing of the child patient and the parents. After the eruption of permanent dentition, if dental caries develop and proper care is not taken, permanent damage may occur and the infection might spread throughout the body.[2] Increase in dental caries in many developing countries resulted from limited use of fluoride, unhealthy dietary habits and poor access to oral health services. Dental caries affects 60-90% of schoolchildren in most developed countries, and in several developing countries the prevalence rates are increasing.[3] Epidemiological surveys can improve the monitoring of population-level trends of important oral health conditions, so that morbidity and treatment needs can help tailor oral health programs to meet real-life health needs.[4] So, the present study was done to determine the association of prevalence of dental caries with brushing frequency, type of toothpaste used and

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sweets consumption frequency among 5 and 12 year old school children.

II. MATERIALS AND METHODS

Aim

To assess dental caries prevalence among 5 and 12 year old school children in relation to brushing frequency, type of toothpaste used and sweets consumption frequency.

Sample selection

A cross sectional study was conducted to determine relationship of dental caries with brushing frequency, type of toothpaste used and sweets consumption frequency among 5 and 12 year old children.

Inclusion Criteria

Children aged 5 and 12 years

Children without any developmental defects

Exclusion Criteria

Children undergoing orthodontic treatment

Children with chronic disease and on long-term medication

Medically compromised children

Examination of Children

Children in the selected age group who agreed to participate in the study were examined at their respective schools in predetermined time schedule, as arranged by the school authorities. In this study, caries was recorded as per WHO criteria (2013) and data recorded on the WHO oral health assessment form (2013). At the time of examination, DMFT and DMFS index (Decayed, Missing, Filled teeth and surfaces index) were recorded for each child. All erupted teeth surfaces were assessed for recording the indices. In posterior teeth, buccal, palatal or lingual, mesial, distal and occlusal surfaces were examined. In anterior teeth, facial, lingual or palatal, mesial and distal surfaces were examined. The recording of caries was done by visual and tactile examination using a mouth mirror and explorer in which D (decayed), M (missing) and F (filled) scores were filled in the respective columns of the teeth involved.

Under natural light conditions, examination was carried out using the sterilized instrument kits. Sufficient number of instruments were autoclaved and packed for each day work. Strict cross – infection control measures were adopted and spot disinfection was done during survey using disinfectant solution- Savlon. WHO Oral Health Assessment form 2013 was used to record the status of decayed, missing and filled teeth status. The presence of a treated or untreated dental caries in any teeth was recorded and taken into account to calculate the dental caries prevalence. All the signs (pain, discoloration etc.) were taken into account that relates to dental caries in the tooth or teeth. At the end of data collection from each school, the students were counselled about the sequalae of dental caries and methods to avoid it. All the students suffering from dental caries were advised to get the treatment done as soon as possible to avoid future complications.

III. STATISTICAL ANALYSIS

Data analysis was done using SPSS (Statistical Package for Social Sciences) version 21.0 and epi – info version 3.0. The statistical test used was Chi – square test for difference between the proportions. Significance for all statistical tests was predetermined at a probability value of 0.05 or less.

IV. RESULTS

Distribution of sample size according to the age

Of the total 502 children, 219 children belonged to the age group of 5 year and 283 belonged to 12-year-old children. (Table 1)

Prevalence of Decayed Teeth in 5 and 12-year-old Children

Graph 1 shows that in the 5-year age group, decayed teeth were present in 63.6% children and in the 12-year age group, decayed teeth were present in 53.6% and this difference was statistically significant ($p = 0.001$). 5-year-old children showed significantly ($p = 0.001$) higher mean number of decayed (D) teeth (2.36) as compared to 12-year-old children (1.06).

Relationship between decayed teeth and brushing frequency

Graph 2 shows the prevalence of decayed teeth between children with no brushing and 2-3 times a month, once a week, several times a week, once a day and twice or more a day.The prevalence of decayed teeth was significantly more among children with no brushing (92.9%) and 2-3 times a month (100%) as compared to those who brush daily (57.9%) or twice a day (55.2%) ($p=0.039$).

Relationship between decayed teeth prevalence and use of fluoridated/ non fluoridated toothpaste

Graph 3 shows that decayed teeth was present in (68.1%) children who used non fluoridated toothpaste for cleaning teeth and (56.0%) children who used fluoridated toothpaste for cleaning teeth.

The prevalence of decayed teeth was significantly more among children without fluoride containing toothpaste in comparison to children with fluoride containing toothpaste ($p=0.028$).

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Relationship between sweets consumption frequency between meals and decayed teeth prevalence

Graph 4 shows that Decayed teeth was present in (50%) children who do not consume sweets, (56.9%) in children who consume once a day, (65.6%) in children who consume twice a day, (68.4%) in children who consume 3 times a day and (66.7%) in children who consume > 3 times a day.

The prevalence of decayed teeth was significantly more among children with sweets between meals comparison to children without Sweets between meals (p=0.010).

V. DISCUSSION

Dental caries is most prevalent oral disease in several Asian and Latin countries. In many developing countries, access to oral health services is limited and teeth are often left untreated or are extracted because of pain or discomfort. Throughout the world, tooth loss is still seen as a natural consequence of ageing. There has been a positive trend of reduction in tooth loss in some industrialized countries among adults in recent years.[5]

In the present study, dental caries prevalence was 63.6% in children of 5 year age group and dental caries prevalence was 53.6% in children of 12 year age group. The mean number of decayed teeth, DMFT score and DMFS score was significantly more among 5 years. Similar study conducted by Nuca C et al[6] in Constanta district, Romania found caries prevalence of 88.3% and 77.2% in 6 and 12 year old children respectively. In the present study, dental caries prevalence was higher in primary dentition (mean deft 2.47, 63.6%) when compared to permanent dentition (mean DMFT 1.18, 53.6%). The reason behind this high caries in 6 years old could be the difference in thickness of enamel in the deciduous and permanent teeth. In deciduous teeth, it is less than that of permanent teeth being 1mm and 2.5mm, respectively. Thin layer of enamel combined with other factors, such as a high sugar diet and/or the inability of a younger child to properly brush their teeth, cumulate the effect. Structural differences and lower calcium content may increase caries susceptibility in deciduous teeth along with lack of preventive measures. Another reason could be that the WHO index record caries only when the caries involves the dentin and not the incipient caries which results in slight underestimation of caries in 12- year age group.[7]

According to our study, the prevalence of decayed teeth was significantly more (p=0.039) among children who did not brush or brush 2-3 times a month in comparison to those who brush regularly. The results of our study are similar to the study conducted by Tadakamadla K S et al[8] in Udaipur in 2012 respectively where they found that decayed teeth prevalence was more among children who do not brush their teeth daily or less often daily when compared with those who brush daily or twice a day. Similar study was conducted by Chu C H et al[9] in Hong Kong and it was found that children who brushed their teeth twice a day had a lower mean deft score than those who brushed only once a day or less often. In our study, the explanation to the brushing frequency can be given as oral diseases are clearly related to behaviour, and dental caries prevalence has decreased with improvements in oral hygiene. Poor oral hygiene was a risk factor for developing dental caries.[10] For plaque removal from tooth surface, tooth brush is more effective. The low dental caries prevalence in tooth brush users may be due to the reason that tooth brush bristles could reach and clean those inaccessible areas of oral cavity that might not be accessible to the finger and other materials.[11]

Also, the prevalence of decayed teeth was more among children with use of toothpaste without fluoride in comparison to children with use of fluoride containing toothpaste. Mafuvadze TB et al[12] found that the use of fluoride containing toothpaste significantly reduced the risk of developing dental caries.

In the present study, prevalence of decayed teeth was more among children who consumed sweets between meals more frequently in comparison to children with low frequency and without sweets between meals. The results of our study are in accordance with the study by Kumar S et al[13] where prevalence of dental caries was significantly more among those who consumed sweets more than once a day. Wilson B et al[14] found that children who had sugar consumption at least three times a day had higher DMFT scores than those who did not and the results were found to be statistically significant. In a study conducted by Iftikhar A et al[15] it was found that decayed teeth prevalence were 3.89 times more in children consuming cookies as compared to children who do not consumed cookies and this association was statistically significant.

The increased rate of tooth decay in school going children consuming sweets frequently predicates that sweets are high risk factors for caries in young age and their frequent consumption should be discouraged.[15]

VI. CONCLUSION

This study thus gives a brief insight into

the dental caries in relation to various factors among 5 and 12 year old children. Besides, this is an important period for instituting preventing programmes because as the teeth erupt, bacteria colonize tooth surfaces and dental behavior starts to develop during this time. It is however important to carry out an in-depth screening survey on a larger population to draw definite conclusions about dental caries.

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Age	Number	Percentage
5 years	219	43.62%
12 years	283	56.38%

Table 1: Distribution of sample size according to age of children.

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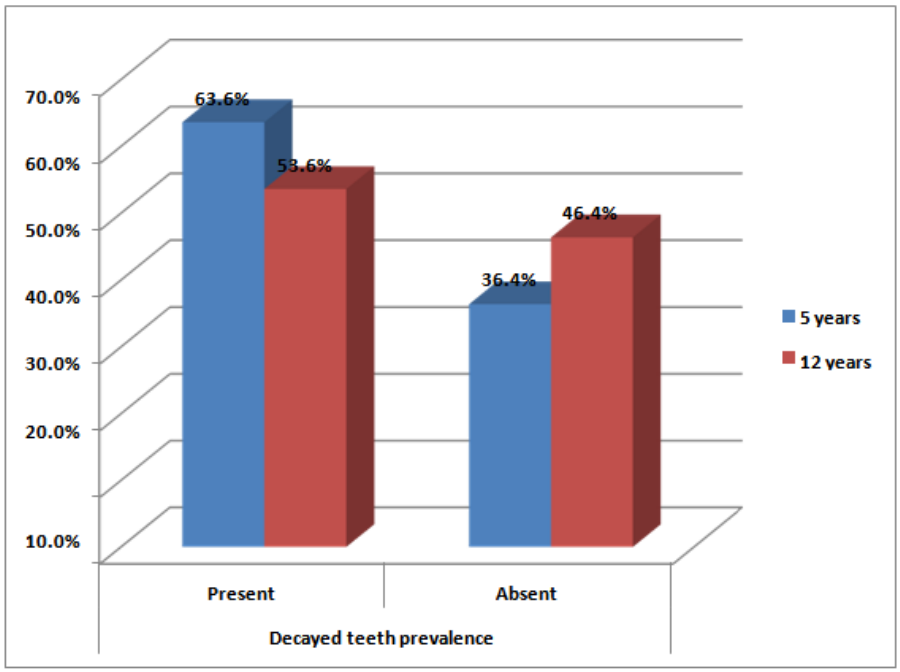
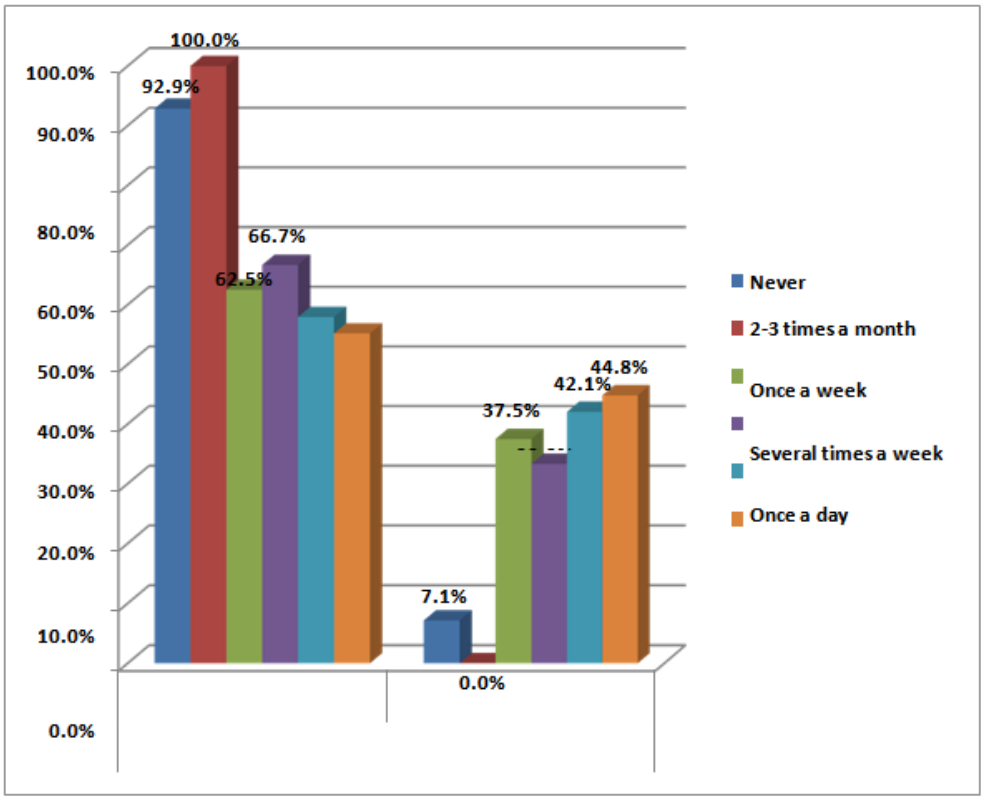


Graph 1: Prevalence of decayed teeth in 5 and 12 year old children



Graph 2: Relationship between decayed teeth prevalence and brushing frequency

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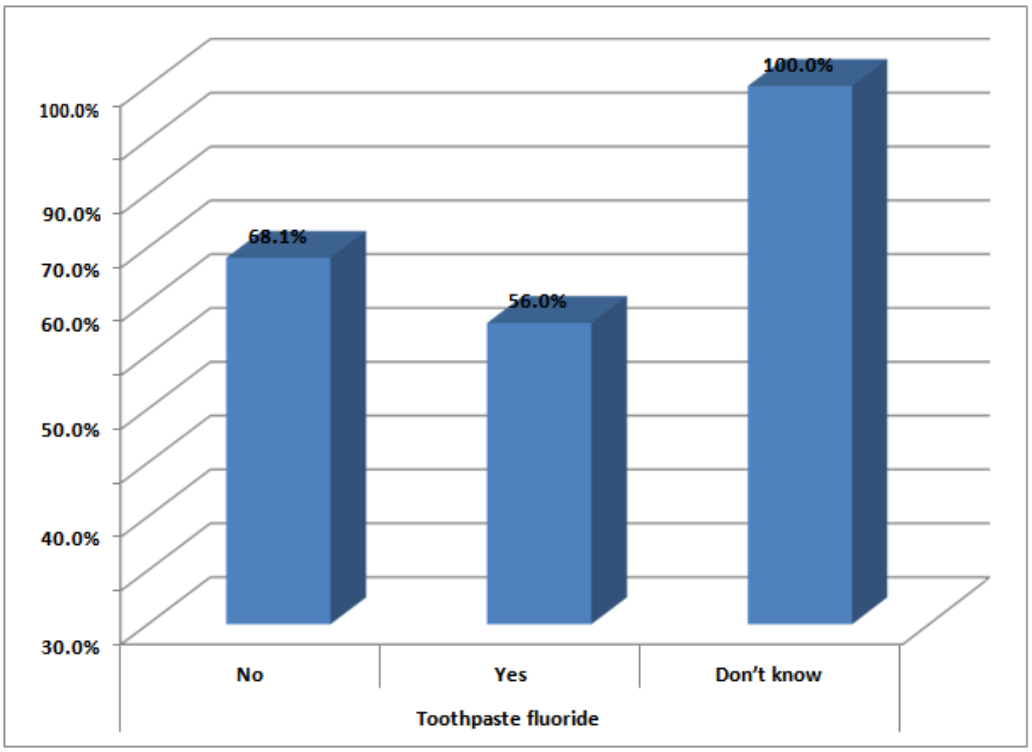
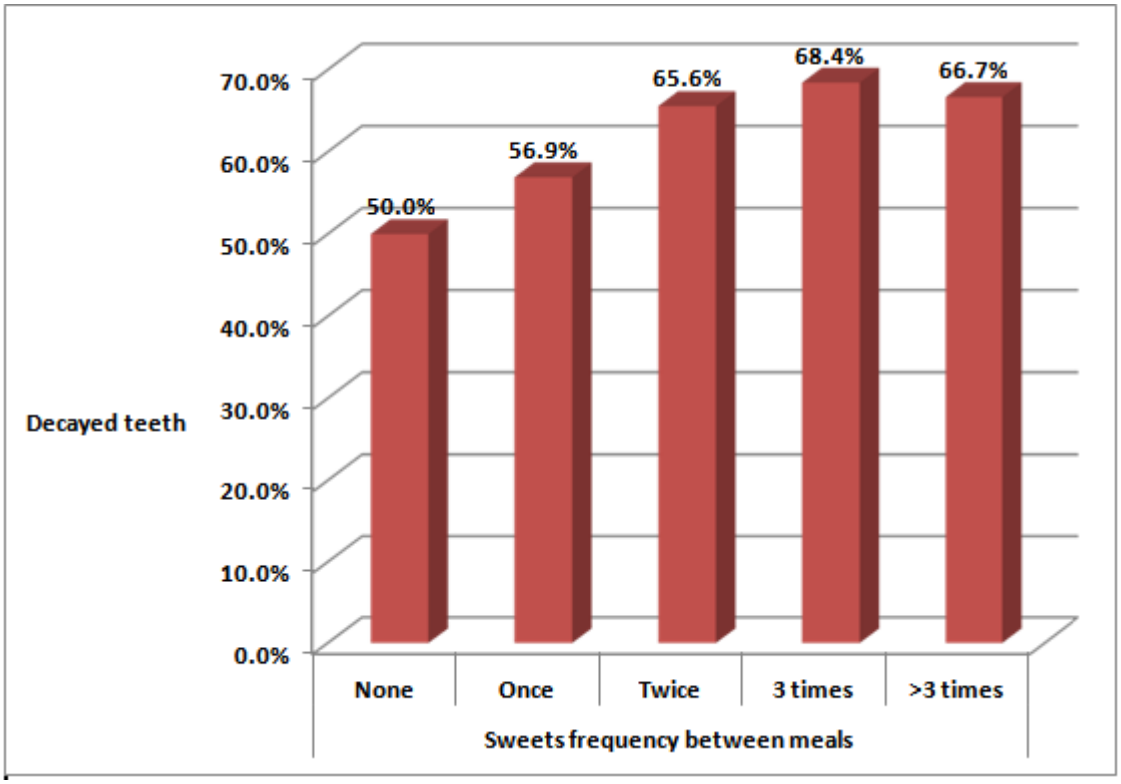


Graph 3: Relationship between decayed teeth prevalence and use of fluoridated/ non fluoridated toothpaste



Graph 4: Relationship between sweets consumption frequency between meals and decayed teeth prevalence