

## Original Research

### Distribution of Plaque and Gingivitis and Associated Factors in 3 to 5 Years Old Nagpur School Children

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#### ABSTRACT:

**Introduction:** Oral microbiomes are important not only in the immediate environment of the oral cavity, but also systemically as well. For instance, although dental caries, the most common chronic disease in children, is of a multifactorial nature, it usually occurs when sugar is metabolized by acidogenic plaque-associated bacteria in biofilms, resulting in increased acidity and dental demineralization, a condition exacerbated by frequent sugar intake. **Aim:** To investigate the distribution of plaque and gingivitis and its association with demographic, socioeconomic, and visible plaque level (low, medium, high) in Nagpur school children. **Material and method:** The cross-sectional study comprised of 100 children aged 3 to 5 yrs old of both sexes attending 6 schools (3 Private, 3 Government) randomly selected. A questionnaire and clinical examination were used to collect data. Dental clinical examination were conducted to evaluate visible plaque and gingival bleeding. **Results:** 86% of study population had gingivitis. A total of 12% had mild gingivitis and 74% had moderate gingivitis. 86% of study population had gingivitis. Boys were affected more than girls. **Conclusion:** The results obtained demand a special attention toward these children of less affluent families for the promotion of oral health by regular conduct of treatment camps by corporation and other agencies.

**Key words:** Gingivitis, Periodontal diseases, Plaque in children.

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#### INTRODUCTION

Population studies demonstrate that chronic gingivitis and chronic periodontitis are still prevalent human diseases.(1) Oral microbiomes are important not only in the immediate environment of the oral cavity, but also systemically as well. For instance, although dental caries, the most common chronic disease in children, is of a multifactorial nature, it usually occurs when sugar is metabolized by acidogenic plaque-associated bacteria in biofilms, resulting in increased acidity and dental demineralization, a condition exacerbated by frequent sugar intake.(2) Dental Bacterial Plaque is a thin, yellowish-white coating (thereafter referred to as biofilm) which adheres to various dental surfaces and consists of microbial

colonies and products of oral microbial flora metabolism. Biofilm is defined as “bacterial communities that are embedded in a self-produced matrix of extracellular polymeric substances”.(3) Over the past few decades, extensive research has provided much information on the connection between dental caries and dental plaque bacteria.(4) Children are predominantly susceptible to dental caries and gingival diseases due to changing dietary habits with increased consumption of refined carbohydrates and less focus on oral hygiene maintenance.(5) Plaque-induced gingivitis is the most common type of gingivitis.(6)

Chronic marginal gingivitis is the most prevalent type of gingival change in childhood. Dental plaque causes inflammation within the gingival tissues,

which manifests as clinical signs of gingivitis.(7) Histologically it is characterized by the presence of an inflammatory exudate and edema, some destruction of collagenous gingival fibers, ulceration and proliferation of the epithelium facing the tooth. There are suggestions in the literature that the host responses expressed in the gingiva of children may differ from those of adults. Histologically, gingivitis in children is dominated by lymphocytes and includes fewer plasma cells than does gingivitis in adults.(8) The etiology of gingivitis is multi-factorial and the result of more than one factor acting together. A wide range of factors has been identified as significantly associated with gingivitis including the presence of bacteria biofilm, genetic, socioeconomic, demographic, iatrogenic, and behavioral factors.(9)

Findings from epidemiologic studies have consistently demonstrated a close relationship among the age of a population, the oral hygiene condition, and the frequency and severity of periodontal disease.(10) A whole array of periodontal diseases and conditions can affect the younger age group.(11) Adequate daily removal of dental plaque prevents periodontal diseases and dental caries.(12) Consumption of fast foods has become nearly a world development. India's fast food business is increasing at the speed of four hundredth once a year.(13)

Hence, this cross-sectional study investigated the distribution of plaque and gingivitis and its association with demographic, socioeconomic, and visible plaque level (low, medium, high) in Nagpur school children.

### MATERIALS AND METHODS

The cross-sectional study comprised of 100 children aged 3 to 5 yrs old of both sexes attending 6

#### Gender distribution:

Gender	N	%
Male	48	48.00
Female	52	52.00
<b>Total</b>	<b>100</b>	<b>100</b>

#### 86% of study population had gingivitis. Boys were affected more than girls.

Type of School	N	%
Private/Govt	54	54
Public	46	46
<b>Total</b>	<b>100</b>	<b>100</b>

#### Mean plaque and gingival indices of children from public and private school

School	Plaque index	Gingival index
<b>Public/Govt</b>	<b>1.72+ 0.59</b>	<b>1.76+ 0.65</b>
<b>Private</b>	<b>1.44+ 0.66</b>	<b>1.44+ 0.66</b>

Plaque and gingival scores were found to be higher among public school children than among private school children, but no significant difference between two groups.

schools (3 Private, 3 Government) randomly selected. A questionnaire and clinical examination were used to collect data. Dental clinical examination were conducted to evaluate visible plaque and gingival bleeding.

#### INCLUSION CRITERIA FOR PLAQUE INDEX

All deciduous teeth are considered. Surfaces examined are the four gingival areas of tooth, i.e Distofacial, facial, Mesiofacial and lingual areas.

#### EXCLUSION CRITERIA FOR PLAQUE INDEX

Only plaque of the cervical third of the tooth is evaluated with no attention to plaque that has extended to middle or incisal thirds.

#### PROCEDURE FOR PLAQUE INDEX

The oral examination of children were conducted using natural light, standard mouth mirror and explorer. The tooth is dried and examined visually. When no plaque is visible an explorer is used to test the surface. The explorer passed across the tooth surface in the cervical third and near the entrance of the sulcus.

#### RESULTS

86% of study population had gingivitis. A total of 12% had mild gingivitis and 74% had moderate gingivitis. 86% of study population had gingivitis. Boys were affected more than girls. Prevalence of gingival disease in the age group of 3-5 yrs was found to be 86%.Prevalence of gingival disease was found to be more in males than females. Moderate type of gingivitis was more prevalent than mild or severe type. A positive and significant correlation was found between Plaque index and Gingival index.

## DISCUSSION

Shick H. S. (1960) studied prevalence of gingivitis in 807 children in Bombay in age group of 5-19 and reported that 74.59% gingivitis. A total of 21.26% of study population had mild gingivitis and 62.32% had severe gingivitis. (14) In our study 86% of study population had gingivitis. A total of 12% had mild gingivitis and 74% had moderate gingivitis.

Dutta Arabinda (1965) studied prevalence of gingivitis in 1424 children in Calcutta in age group of 6-12 and reported that 96.5% gingivitis. Boys (91.6%) were affected more than girls (87.6%). (15) In our study 86% of study population had gingivitis. Boys were affected more than girls. Prevalence of gingival disease in the age group of 3-5 yrs was found to be 86%.

Prevalence of gingival disease was found to be more in males than females. Moderate type of gingivitis was more prevalent than mild or severe type. A positive and significant correlation was found between Plaque index and Gingival index.

The number of children with caries in industrialized countries is currently estimated to exceed 80% of the population, and in underdeveloped countries, the caries rate is thought to be much higher. (16)

Children attending rural-public schools had a lower prevalence of dental calculus compared to children attending private and public-urban schools, but a significantly higher prevalence of subgingival calculus compared to children in private schools. (17)

Prevention and treatment of early stages of periodontal diseases are relatively simple and very effective. In many cases it is enough to have the social education and instructions for correct and regular oral hygiene. (12)

## CONCLUSION

The present study reveals the current oral health status of private and government school-going children in Nagpur city. The results obtained demand a special attention toward these children of less affluent families for the promotion of oral health by regular conduct of treatment camps by corporation and other agencies.

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