

GINGIVAL HEALTH STATUS OF PRIMARY SCHOOL CHILDREN IN A NIGERIAN COMMUNITY

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ABSTRACT:

Background: Gingival status is a part of periodontal health. Periodontal health may be defined as absence of gingivitis, periodontitis or other periodontal conditions.

Objective: To assess the gingival health status of 11 year old primary school children in a rural community in south -east Nigeria

Methodology: A cross sectional descriptive study of 11 year old primary school children was done in a public primary school in Nkanu -West local Government Area of Enugu State. Ethical clearance for this study was sought and obtained. Socio-demographic data was obtained using interviewer-administered questionnaire. Gingival examination was done by a single examiner (k= 0.76), intra examiner calibration (five children per session) was done prior to data collection, The gingival status was assessed according to the gingival index of Loe and Silness. Statistical analysis was done using SPSS Version 20. P values < 0.05 were accepted as being statistically significant

Results: 22 (46.3%) females, 28(53.7%) males were seen and examined, giving a female to male ratio of about 1:1.3. 2(4 %) had healthy gingiva, 47(94 %) had mild gingivitis , 1(2 %) had moderate gingivitis and none of the participants had severe gingivitis. Mild gingivitis were seen more in males than females. Majority of the school children duration of tooth brushing was about two minutes.

Conclusion: Gingival status is a part of periodontal health. In this study, gingivitis were seen more in males than females, only marginal gingivitis were seen among the school children and none had severe gingivitis.

KEYWORDS: Children, Community, Gingival status, Primary School,

INTRODUCTION

Periodontal health may be defined as absence of gingivitis, periodontitis or other periodontal conditions. Gingivitis of varying levels of severity is a common oral disease in children [1] and adolescents. Oral diseases is strongly influenced by patient's belief, attitudes and values.[2] The main cause of gingival inflammation is dental plaque and the aetiology of gingivitis is multi-factorial. [3] Proper twice daily tooth brushing could help to prevent the accumulation of plaque and reduce the prevalence of gingivitis and periodontitis. Personal and professional plaque/debris removal, and professional calculus removal (oral prophylaxis) have been extensively accepted for prevention of gum diseases [4]

Effective daily tooth brushing reduces microbial plaque biofilm accumulation which is dependent on several factors which include the toothbrush design, duration of tooth brushing, the frequency of tooth brushing, the technique used and the individual's manual dexterity [5]. Children's ability to use the toothbrush varies greatly according to their age, individual dexterity, and motivation. Improving the ability to brush occurs with age, due to increase of motor competence [6]. Children develop gross motor skills prior to fine motor skills and these skills continue to build upon each other as children grow older [7]. Epidemiological data on gingivitis in children are important for understanding the natural course of the disease and identifying its risk factors [1,8]. Studies on gingivitis have been conducted in many parts of Africa with people of different ethnic and cultural backgrounds, but periodic evaluation of data is very much required [9]

Previous study reported that people of lower socioeconomic status have fewer resources to meet oral health challenges: less free time, less money to buy toothpaste and toothbrushes. [10] Children in rural areas tend to be more vulnerable to oral health problems due to socio-economic [11] and demographic factors such as reduced

parents awareness, parents income, parents perceived or felt need for oral evaluation and treatment, and lack of access to quality dental care.[12] Previous study in Indonesia reported a prevalence of gingivitis among 12 year old school children of 99% [13]. A hospital based study conducted in south-south Nigeria reported a prevalence of gingivitis of 82.9% .[14] There are various studies and reports of periodontal and gingival health status among children in Nigeria. The aim of this study is to assess the gingival health status of 11 year old primary school children in a rural community in south -east Nigeria and compare findings with published reports from Nigeria and other countries of the World. It would also contribute to the existing data on periodontal health status of children in Nigeria and the West African sub-region.

MATERIAL AND METHODS

A cross sectional descriptive study of 11 year old primary school children was done in a government primary school in Nkanu -West local Government Area of Enugu State.

The sample size was calculated using the formula for cross-sectional study:

$$N = \frac{Z^2pq}{d^2} \quad [15]$$

N = sample size

p = prevalence

q = 1.0-p

The total sample size was calculated using the following values: prevalence of gingivitis was estimated to be 97.9 % from a previous study [16],

confidence interval 95% (z = 1.96),

d= Margin of Error tolerated, 5% (0.05)

p= 0.979

q= 1.0-p = 0.021

z = 1.96

d= 0.05

$$N = \frac{1.96 \times 1.96 \times 0.979 \times 0.021}{0.0025} = 32$$

10% of non- responders = 3

Sample size= 35

Ethical clearance for this study was sought and obtained. Informed consent was obtained from the parents of the school children and approval was obtained from the head of the school. All participants who gave their assent were recruited for the study and simple random (probability) sampling method was used. Socio-demographic data was obtained using interviewer -administered questionnaire, all study participants were interviewed about their oral hygiene habits such as frequency of tooth brushing, brushing technique and duration of tooth brushing. Gingival examination was done by a single examiner (k= 0.76) , intra examiner calibration (five children per session) was done prior to data collection, and the pupils were examined while seated in an upright position using natural daylight.

The gingival status was assessed on six selected index teeth according to the gingival index of Loe and Silness [17]. All index teeth of the

selected participants were fully erupted. Each of four gingival areas of all index teeth (facial , mesial, distal, and lingual) was assessed for inflammation. The scores for four areas of the tooth were added and divided by four to give a tooth score. By adding the tooth scores together and dividing by the number of teeth examined, an individual's GI score was obtained. .

Nominal scale for evaluation of GI was:

0- Healthy gingiva

0.1-1.0- Mild inflammation

1.1-2.0- Moderate inflammation

2.1-3.0- Severe inflammation

Mild inflammation — slight change in colour, slight oedema, no bleeding on probing.

Moderate inflammation — redness, oedema, and glazing, bleeding on probing.

Severe inflammation — marked redness and oedema, ulceration; tendency to spontaneous bleeding

The plaque index (PI) according to Silness and Loe [17] was also determined on six selected teeth according to the Plaque index of Silness and Loe. After data collection, tooth brushing demonstrations were done. Data were entered into Microsoft Excel spreadsheet and the statistical analysis was done using Statistical Package for Social Sciences (SPSS) Version 20 P values < 0.05 were accepted as being statistically significant. Frequency distribution, mean scores and standard deviation were calculated. Mean comparison of index scores was carried out using independent t- test.

RESULTS

22(46.3%) females, 28(53.7%) males were seen and examined, giving a female to male ratio of about 1:1.3. The mean plaque index score for male was 0.6 ± 0.2 , mean plaque index score for female was 0.5 ± 0.1 , the mean gingival index score for male was 0.3 ± 0.2 and the mean gingival index score for female was 0.2 ± 0.1 . The total mean plaque index (PI-S) score was 0.6 ± 0.1 , total mean gingival index (GI) score was 0.3 ± 0.2 as shown in table 1. The mean plaque index (PI-S) score and mean gingival index score were all higher in males than females. 2(4 %) had healthy gingiva, 47(94 %) had mild gingivitis , 1(2 %) had moderate gingivitis and none of the participants had severe gingivitis as shown in figure 1. Mild gingivitis were seen more in males than females as shown in figure 2. Majority of the school children brush their teeth once daily, using the horizontal scrub technique and the duration of tooth brushing was about two minutes.

TABLE 1: MEAN SCORE OF PARTICIPANTS ACCORDING TO GENDER

Variable	Male	Female	t-value	p-value
Plaque index	0.62 ± 0.2	0.55 ± 0.1	1.62	0.112
Gingival index	0.31 ± 0.2	0.20 ± 0.1	2.03	0.048

Gingival health status of participants

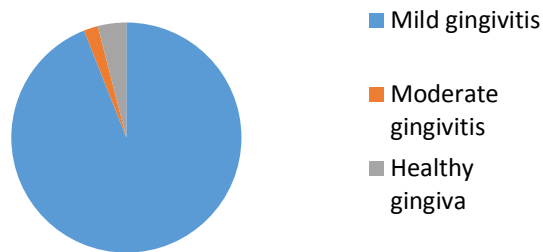
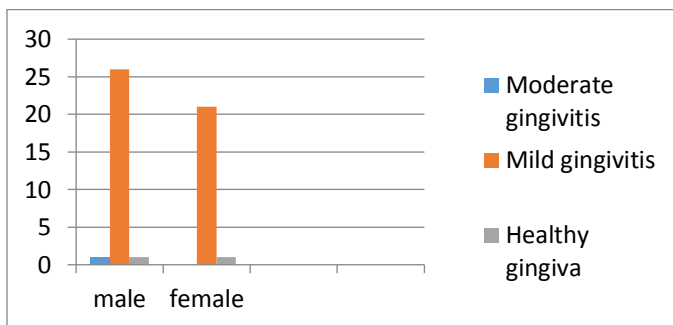


Figure 1: Gingival health status of the participants



p-value = 0.52

Figure 2: Distribution of gingival health status of the participants according to gender

DISCUSSION

Gingivitis is inflammation of the gingivae without involvement of the other tooth supporting tissues, gingival inflammation is often the first sign of an unhealthy periodontium and is induced mainly by the accumulation of microbial plaque biofilm which plays a prominent role in the aetio-pathogenesis of periodontal diseases. Gingivitis of varying degree of severity is a common form of periodontal disease seen in children and adolescents [14,18].

The aetiology of gingivitis is multi-factorial. The main cause of gingival inflammation is dental plaque, other factors, such as systemic diseases, hormonal changes, sex, age, and economic conditions may also influence the response of gingival tissues to dental plaque.[1] Several forms of gingivitis in children and adolescents have been described, and several indices have been used in order to clinically characterize the degree of gingival inflammation. The most common indices that have been used to clinically characterize the degree of gingival inflammation are bleeding on probing, determined by gingival index (GI).[3]

This study was conducted using gingival index of Loe and Silness. In this study, 4 % of the school children had healthy gingival, this was close to previous study of 1.2% among 10-13 year old school children[19], and less than previous report of 21.4% among 12 year old children [8]. 96 % of the study participants had gingivitis, this was less than previous study in south -south Nigeria of 82.9%[14], was similar to 97.9% from a previous community based study in south-

west Nigeria[16], and was similar to previous study of 99% among 12 year old school children in Jakarta, Indonesia[13]. The participants of this study were selected from a public primary school, with the selection of participants from two or more public or private primary schools, there could be marked or slight variation in proportion of children with normal gingivae, mild gingivitis, moderate gingivitis and severe gingivitis.

Gingivitis in children occurs, usually as a result of bacterial plaque accumulation on the cervical margins of the teeth [20]. It has been reported that marginal gingivitis begins early in childhood, increases in prevalence and severity at puberty, and then subsides slightly to the remainder of the second decade of life [1]. In this study, only marginal gingivitis were seen among the children and none had severe gingivitis. The association of gingival health status with gender was not statistically significant.

There is a tertiary health facility offering dental services around the vicinity of the community, None of the respondents had visited a dental clinic at the time of data collection [November, 2019]. This could be as a result of household income, absence of dental health insurance, level of awareness, lack of perceived or felt need for oral evaluation and utilization of preventive dental service by the parents, guardians or caregiver towards the children. Previous studies in developing countries reported gingival inflammation among children and young populations, especially in those residing in the rural and remote areas and in those of low socioeconomic strata.[1] Personal and professional plaque/debris removal, and professional calculus removal (oral prophylaxis) have been extensively accepted for prevention of gum diseases. Visit to dental clinics by children is recommended for both preventive and curative reasons.

CONCLUSION

Gingival status is a part of periodontal health. In this study, gingivitis were seen more in males than females, only marginal gingivitis were seen among the school children and none had severe gingivitis.

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