

Prevalence of Dental Caries among Secondary School Children in Ihiala Local Government Area, Anambra State, Nigeria

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Abstract – An epidemiology study on dental caries was carried out among the secondary schools in Ihiala local government area of Anambra State. A total of 144 students were screened, 64 students from Abbot Boys and 80 students from Uli girls secondary school. A pretested questionnaire was administered on each student to identify their knowledge, attitude and practice about dental caries. Each student was examined clinically for signs and symptoms of dental caries. The result showed that out of 144 students examined, 66(45.8%) were positive while 78(54.2%) were negative for dental caries. The distribution of dental caries by schools shows that Uli girls secondary school had the highest prevalence of 44(55%) while abbot boys had the least prevalence with 22(34.4%). The gender related prevalence depicts that female had more prevalence with 44(55%) while male students had the least prevalence with 22 (34.4%). In age related prevalence 16-18years had more prevalence with 12(54.5%) while 10-12 years had the lowest prevalence with 4(18.2%). Of the dental caries observed, extracted had highest prevalence 12(54.5%) in Abbot boys and 24(54.5%) in Uli girls while decayed was the least with 4 (18.2%) in Abbot boys and 8 (18.2%) in Uli girl secondary school. In conclusion, the result of the study showed that dental caries is common among secondary school children in Ihiala. This underscores the need for improved rural hygiene habits, and dental care amongst the students.

Keywords – Prevalence, Dental Caries, Secondary School Children, Gender.

I. INTRODUCTION

Dental caries, according to world health organization is defined as a localized, post eruptive pathological process of external origin. It involves softening of the hard tooth tissue and proceeding to the formation of a cavity. It is disease also known as tooth decay, which damages the structures of teeth. Specifically, in dental caries, mineralized tissues of the tooth undergo progressive destruction from the surface of the tooth to dentine (Todar, 2002). Tooth decay is caused by acid producing bacteria, which is responsible for the most damage in the presence of carbohydrates such as sucrose and glucose (Todar, 2002). The disease is asymptomatic (people with the disease do not show any observable symptoms). The earliest sign of a carious lesion is the appearance of a chalky white spot on the surface of the tooth indicating an area of demineralization of enamel. In some individuals, dental caries causes bad breath, foul tastes, great sufferings, pains and burden (Wondowossen *et al*, 2004). It is the most prevalent chronic disease of childhood, yet oral health is often neglected within the health system

(Mignogis and Fedele, 2006). Dental caries is a widespread public health problem in both developed and developing countries (Sherham, 2002). The diseases are more severe in countries in Asia and Latin America than those in Africa (Ohalete *et al.*, 2012).

Research on dental caries in Nigeria has been conducted for several decades. The prevalence of caries in the early 1980s was high (Noah, 1981, Alakiya, 1983). However, the prevalence of dental caries varies with the study location in Nigeria ranging between 13.9% to 17.4% in the semi-urban settlement of Ile-Ile (Adekoya *et al.*, 2006; Ozegbo and Esan, 2013), to between 11.2% and 48.0% in urban areas such as Benin (Alakiya, 1983; 2009, Okoye *et al.*, 2010), Lagos (Sho.S, 2004, Giwa, 2005) and Ibadan (Deloye *et al.*, 2005).

The prevalence is higher in urban than in rural areas (Adegbembo *et al.*, 1995), higher in northern than in southern Nigeria (Akpata, 2004) and higher in primary dentition (2-3 years) than in permanent dentition (12years and above) (Akpata, 2004). In Nigeria, the severity of caries is low mostly in primary dentition and high in permanent dentition where there is often a high level of untreated caries (Morenike *et al.*, 2014). In the south east zone of Nigeria, there is paucity of information about status of the disease and there has been no such study in Ihiala local government area of Anambra State. Therefore the intension of this study is to determine the prevalence of dental caries among secondary school children in Ihiala L.G.A of Anambra State.

II. MATERIALS AND METHODS

Study Area: Ihiala local government area with coordinates 5.85° N 6.86° E is located in the south senatorial zone of Anambra State. It lies within the agricultural belt of Anambra state with vegetation cover as Tropical Rain forest. The study area is made up of 10 towns; Ihiala, Uli, Amorka, Azia, Mboji, Lilu, Iseke, Ubuluisiuzo, Osmorghu and Okija. It covers an estimated area of 92km²; it is made up of both semi-urban and rural settlement of about 87,796 persons (National population census, 2006). There are government health centres and health post located in each of the towns. Our lady of Fatima Hospital Ihiala (a mission hospital) is the largest and its services all the town in the local Government area. There are also private hospitals. The inhabitants of the study area are mainly farmers, few civil servants, many students and petite traders. The major source of drinking water is streams, boreholes and underground surface tanks. There are public and private

primary and secondary schools in the study area. There are commercial banks in Ihiala Local Government area and Universities including Anambra State University, Madonna University and Atlantic University. There are two seasons; rainy seasons (April- October) and dry season (November - March).

Sample and Sampling Techniques: A simple random technique was used in the selection of schools and student. Two secondary schools were randomly selected in Ihiala Local Government. A total of 144 students were randomly selected, where at least 50 students (including both girls and boys) were randomly selected from each school. The percentage prevalence was calculated as: school.

Data Collection: Structured questionnaires were used to obtain information about the personal data of the students, frequency of tooth brushing, sweet consumption per day and dental visit behavior, snacks habit and other variables. The questionnaires issued to the students were completed under the supervision of a dentist in order to prevent bias. Students were examined for dental caries using dental mirror and blunt prober under artificial (touch) and natural day light while seated comfortably on back chairs. The diagnosis of caries was made based on the guidelines laid down by World Health Organization (WHO 2000). A tooth was classified carious when there was either a cavity, enamel or a softened floor or wall on either the pit or fissure or one of the smooth surfaces. Dental status was carried out using Dental Missing Filled Teeth (DMFT) index following WHO (1998) criteria for epidemiological studies.

$$\text{Prevalence (\%)} = \frac{\text{Number of students infected} \times 100\%}{\text{Total number of students examined}}$$

Data Analysis: Results were presented in tables, and expressed as percentages, chi-square (X^2) tests were used for the comparison of proportions. The level of significance was set at 5%.

III. RESULTS

The overall results or prevalence of dental caries among secondary school children of Ihiala Local Government was summarized in table 1. Out of 144 respondents examined 66 (45.8%) were positive for dental caries while 78 (54.2%) were negative. Of the two schools examined, Uli Girls Secondary School has highest prevalence of dental caries with 44 (55%) while Abbot Boys Secondary School has the least prevalence with 22 (34.4%).

The distribution and prevalence of dental caries in Abbot boys secondary school with respect to age was shown in table 2. Out of 64 students screened in Abbot boys, 22 (34.4%) were positive for dental caries while 42 (65.6%) were negative. Of different ages sampled, students between the age of 16 – 18 yrs 9 (40.9%) had highest prevalence of the dental caries observed from the respondents. Extracted had highest prevalence with 12 (54.5%) while decayed had least prevalence with 4 (18.2%) respectively.

Table 3 depicts the distribution and prevalence of dental caries in Uli girls secondary school with respect to age.

Total of 80 students were screened in Uli girls secondary school, of which 44 (55%) were positive and 36 (45%) were negative. Of different ages sampled, student between the age of 16 – 18 yrs 21 (47.7%) had highest prevalence of dental caries.

The percentage prevalence of extracted tooth was higher with 24 (54.5%) while filled had least prevalence with 8 (18.2%) respectively.

Table 4 summarizes the prevalence of dental caries in relation to gender. Of the total number of respondents screened 64 were males while 80 were females. Females had the highest prevalence of dental caries with 44 (55%) while the male had the least prevalence with 22 (34.4%) respectively.

Table 5 shows the respondent knowledge on dental caries amongst 144 students examined. About 80 (55.6%) of the total respondent agrees that they have heard about dental caries before while 64 (44%) indicated that they have not heard about dental caries before.

Table 6 shows the respondents knowledge on tooth cleaning towards prevention of dental caries. Of 144 respondents, 134 (93.1%) indicated that they are using tooth brush for tooth cleaning while 10 (6.9%) respondents indicated that they are using chewing stick for tooth cleaning.

Table 7 shows the respondent knowledge on the use of different kinds of tooth paste. Of the 144 respondents, children making use of close – up had the highest user with 60 (41.7%) while the number of children making use of holdent tooth paste had the least users with 10 (6.9%) respectively.

Table 8 depicts the attitudinal behavior of respondents in relation to dental caries. Of the 144 respondents, 48 (33.3%) indicated that they have visited 9 dentist while 96 (66.7%) indicated that they have not visited a dentist.

Table 9 shows the attitudinal behavior of respondents in relation to dental caries.

Frequency of Brushing

Of the 144 respondent, the number of those that brushes once a day is higher with 100 (69.4%) while those that brushes occasionally is lower with 12 (8.3%) respectively

Sugary Snacks

Of the 144 respondents, those that consume sugary snacks is higher with 106 (73.8%) respondents while those that do not consume has the lower number of respondents with 38 (26.4%) respectively.

Sweet Drinks

Of the 144 respondents, those that consume sweet drinks is higher number with 104 (72.2%) while those that do not consume sweet drinks is lower in number with 40 (27.8%) respectively.

Cold and Hot Food

Out of the 144 respondents, those that consume cold and hot food is higher in number with 112 (77.8%) while those that do no consume is lower in number with 32 (22.2%) respectively.

Treatment Suggestions

Out of the 144 respondents, 48 (33.3%) suggested the use of herbal medicine as the best treatment method to

dental caries while 96 (66.7%) indicated that visiting a dentist is the best treatment method to dental caries.

Table 10 shows the sources of information of the respondent. Of the 144 respondents, the number that got their information on dental caries from health officer had the highest number of respondents with 50 (34.7%) while those that got their information from father had the least respondents with 10 (6.9%) respectively.

Table 11 depicts the class of respondents screened in the study area. Out of the 144 students screened for dental caries, JSS3 had the highest number with 42 (29.2%) while JSS 2 had the least number of respondents with 10 (6.9%) respectively.

IV. DISCUSSION

Dental disease is a growing public health problem in Nigeria. At present, very few studies have been carried out on dental disease to determine its actual prevalence. Thereby making it difficult to create a detailed epidemiological picture in Nigeria. However, the present study have shown that different dental diseases are prevalent in the study area. The overall prevalence of dental caries 55% in the present study is higher than that 45.8% reported by Ademgbembo (2002) in western Nigeria. The reason behind this increment may be as a result of increase in the rate of sweet snacking, consumption of sugary diet like ice cream, chocolate, juice and other sugary drinks. It can also be as a result of non-chalant attitude towards the utilization of dental services disease many people take tooth problems as a common disease until it becomes critical.

The prevalence of dental caries were higher in the study participants ages 16 – 18 years and lower in those aged 10 – 12 years. This higher prevalence is attributed to the common habits of adolescent in consuming sugary diets at random. This helps in the development of thick plaque, this increasing the risk of having caries and pupils which is an extension of the carious process.

The gender related prevalence of dental caries showed a higher rate in females than in male students. The higher prevalence among female may be as a result of the female hormone progesterone which dilates blood vessels thereby aiding inflammation and inhibition of the repair of collagen, the structural protein that supports the gum (Adegbembo, 2002). Progesterone level is higher in adolescents, pregnant woman and women who use oral contraceptive containing synthetic progesterone. In addition, females as part of their nature are more inclined to consume sugary diets which encourage bacterial growth and dental decay.

The result of the survey on the knowledge of the respondents who indicated that they have heard about dental caries is higher than those that indicated that they have not heard it. This may be as a result of improved communication system and social networks, oral health programmes by health officers and good formal education in schools.

Table 6 shows the respondent knowledge on tooth cleaning tool towards prevention of dental caries depicts

that tooth paste users is higher than chewing stick users. This finding could be associated with the fact that most tooth paste contain fluoride and other substances which have antibacterial activities and consequently reduce the risk of developing dental caries.

Accordingly, the American Dental Association (ADA) recommends tooth paste containing 1,000 to 2, 500ppm (1 to 2.5mg per gram) of fluoride or fluoride mouth solutions containing 0.05% to 0.2% fluoride as capable of reducing the risk of dental diseases due to their antibacterial activity.

On the other hand the low number of chewing users may be as a result of civilization because people have seen it as an outdated means of tooth cleaning. The established efficacy of the antibacterial activities of fluorides in tooth paste, the high prevalence of dental caries in the study population might have been influenced by low level of oral hygiene habits in the study area.

Poor utilization of dental services and increased consumption of sugary diets lead to the high prevalence of dental caries in the study area. In addition, the frequency of brushing is very low in the study area. Those that indicated that they brush once a day were higher in the result than those that indicated that they brush morning and night are shown in table 9. This may be as a result of poor socio-economic attitude, poor parental upbringing and non chalant attitude of children towards implementing what they have been taught about good oral hygiene practices.

The present study as showed in table 7 if higher in number with 60 (41.7%) followed by those using oral B 32 (22.2%) and the tooth paste with the lowest number of users is Holdent with 10 (6.9%) respectively, this may be as a result of parents knowledge on the content and work of those tooth paste and poor financial background. It has been reported that access to money and parents knowledge on the type of tooth paste to but have direct influence on the children's oral hygiene practices (Robertson *et al.*, 2004).

The overall result of the source of information of the respondents as shown in table 10 shows that out of the 144 respondents, the number of respondents that got their information on dental caries from health officer had the higher number of respondents with 10 (6.9%) respectively. This may be as a result of poor information from teachers and social networks. A previous study showed that the probability of having information on oral hygiene and practices was significantly associated with the type and rate at which informations are circulated (Ojofeitimi *et al.*, 2000). Other programmes shown in televisions channels, radio stations and other communications sources have taken the time when informations related to health and good oral hygiene practices would have been made known to the public.

Finally, the data collected by questionnaires have limitation (Cozby *et al.*, 1998) over reporting is a possibility regarding desirable outcome like the frequency of tooth brushing and dental visits while consumption of sweets can be under reported.

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Table 1: Prevalence of dental caries with respect to schools

Schools	Total number examined	Number positive (%)	Number negative (%)
Abbot boys	64	22 (34.4)	42 (65.6)
Uli girls	80	44 (55)	36 (45)
Total	144	66 (45.8)	78 (54.2)

Table 2: Prevalence of dental caries in Abbot boys with respect to age.

Dental caries	Total number with caries	Ages of the respondent			
		10 – 12	13 – 15	16 – 18	19 – 21
Decayed	4 (18.2%)	- (0.0%)	1 (20%)	2 (22.2%)	1 (25%)
Extracted	12 (54.4%)	2 (50%)	3 (60%)	6 (66.7%)	1 (25%)
Filled	6 (27.2%)	2 (50%)	1 (20%)	1 (11.1%)	2 (50%)
DEF total	22	4 (18.2%)	5 (22.7%)	9 (40.9%)	4 (18.2%)

Key: D = Decayed, E = Extracted, F = Filled

Table 3: Prevalence of dental caries in Uli girls with respect to age

Dental caries	Total number with caries	Ages of the respondent			
		10 – 12	13 – 15	16 – 18	19 – 21
Decayed	12 (27.3%)	1 (16.7%)	3 (30%)	6 (28.6%)	2 (28.6%)
Extracted	24 (54.5%)	4 (66.7%)	6 (60%)	12 (57.1%)	2 (28.6%)
Filled	8 (18.2%)	1 (16.7%)	1 (10%)	3 (14.3%)	3 (42.9%)
	44	6 (13.6%)	10 (22.7%)	21 (47.7%)	7 (15.9%)

Table 4: Gender – related prevalence of dental caries in study area.

Gender	Total number examined (%)	Number positive (%)	Number negative (%)
Male	64 (44.4)	22 (34.4)	42 (65.6%)
Female	80 (55.6)	44 (55)	36 (45)
Total	144	66 (45.8)	78 (54.2)

Table 5: the respondent knowledge on dental caries

Responses	Number of respondents	%
Yes	80	55.6
No	64	44
Total	144	100

Table 6: Percentage of respondents according to oral hygiene habits.

Responses	Number of respondents	Percentage
Chewing stick	10	6.9
Tooth brush	134	93.1
Total	144	100

Table 7: Knowledge on the use of tooth paste

Response	Number	Percentage
Herbal	18	12.5
Oral B	32	22.2
Close up	60	41.7
Maclean	12	8.3
Mymy	12	8.3
Holdent	10	6.9
Total	144	100

Table 8: Shows the attitudinal behavior of respondent on the use of dentist services

Practice	Number	Percentage
Ever visited the dentist		
Yes	48	33.3
No	96	66.7
Total	144	99.9

Table 6: Shows the attitudinal behavior of respondents in relation to dental caries

Practice	Number	Percentage
Frequency of brushing		
Once a day	100	69.4
Twice a day	32	22.2
Occasionally	12	8.3
Total	144	99.9
Sugary snacks		
Consume	106	73.6
Do not consume	38	26.4

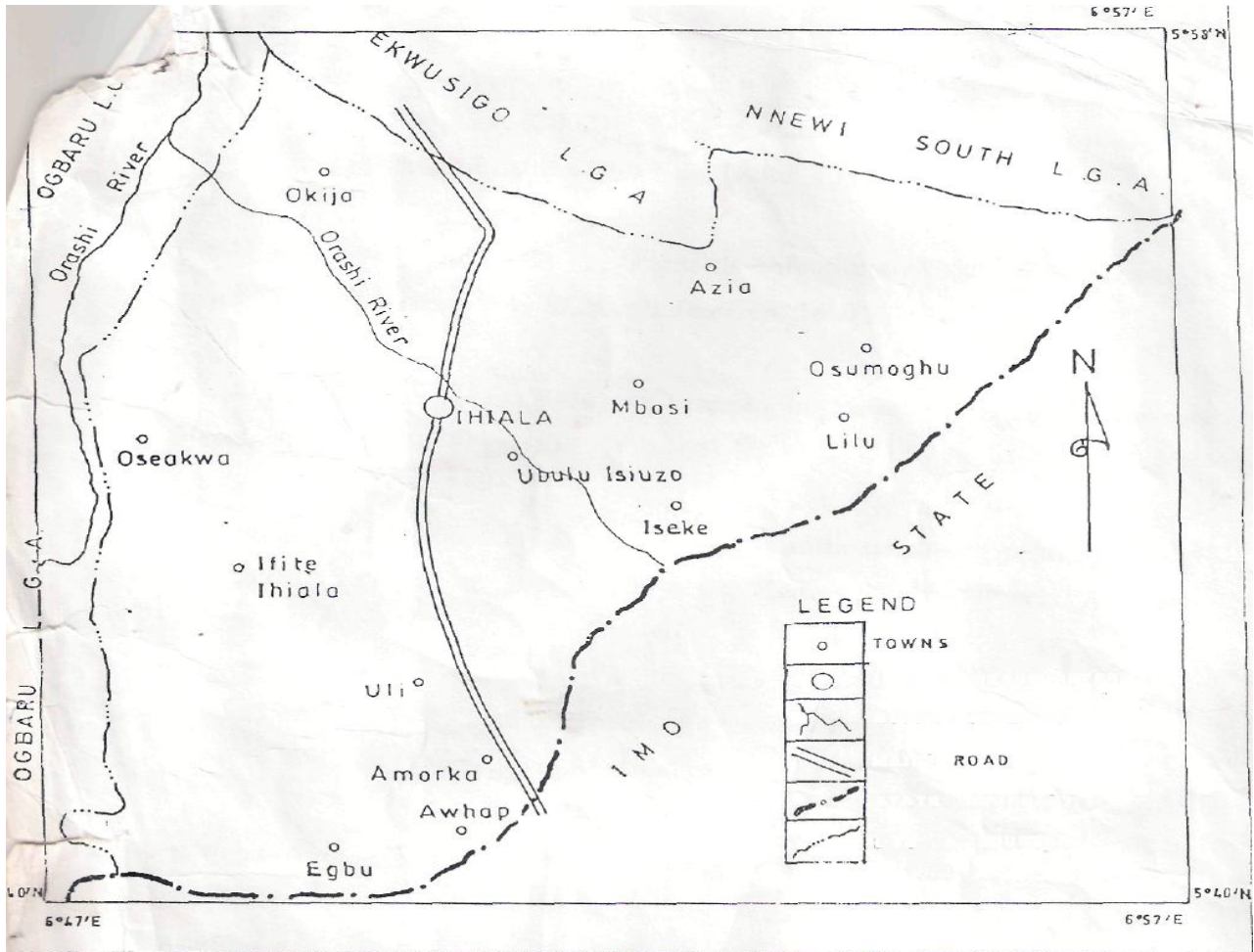
	144	100
Sweet drinks		
Consume	104	72.2
Do not consume	40	27.8
	144	100
Cold and hot food		
Consume	112	77.8
Do not consume	32	22.2
	144	100
Treatment suggestions		
Use of herbal medicine	48	33.3
Visiting a dentist	96	66.7
	144	100

Table 10: Depicts the sources of information of the respondents

Sources of information	Number	Percentage
From friends and siblings	18	12.5
From mother	23	16
From father	10	6.9
From health officer	50	34.7
From teachers	20	13.9
From social networks	23	16
Total	144	100

Table 11: Shows the class of respondents in the study area.

Class of respondents	Number	Percentage
JSS 1	18	12.5
JSS 2	10	6.9
JSS 3	42	29.2
SS 1	20	13.9
SS 2	31	21.5
SS 3	23	16
Total	144	100



Scale : 1 : 12,500

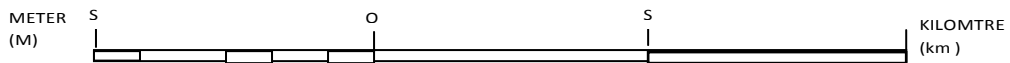


Fig.7. Map of ihiala local government area in anambra state showing study area