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Prevalence and Pattern of Anaemia among New Entry Students in a Secondary School in Warri, Delta State.

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ABSTRACT: Anaemia in children and adolescent constitute a major public health concern as it may affect cognitive development, concentration and performance in school. 460 new entry students aged 9yrs to 17yrs were screened for anaemia after collecting venous blood over a period of two months. Anaemia was catergorized and graded on WHO criteria. 70% of the students had no anaemia while 30% had anaemia. Of those who had anaemia, 97% had mild anaemia and 3% had moderate anaemia while none had severe anaemia. prevalence of anaemia was more in the male children (42%) while it was more in the female adolescent (32%). It concludes that anaemia is prevalent among new entry children and adolescents in Warri primarily presenting as mild to moderate anemia. This emphasizes the need for targeted school-based nutritional and health interventions to mitigate anemia in this vulnerable group. These interventions may include health education, routine screening, routine de-worming, school nutrition and food fortification and improved sanitation especially around the school premises and improved Government policy and funding.

KEYWORDS. Prevalence, Anaemia, Children, Adolescent, New entry students.

INTRODUCTION

Childhood and Adolescence is the period of most rapid growth and the physical and physiological changes that occur in adolescents place a great demand on their nutritional requirements and make them more vulnerable to anemia.[1,2] Children are classified as those within the ages of 6yrs and 11yrs while adolecents are those within the ages of 12yrs and 18yrs. Anaemia in the adolescence causes reduced physical and mental capacity and diminished concentration in work and educational performance.[1,2,3] New entry students (children and adolescent) require optimum health to be able to perform best in the school environment.

Anaemia is the reduction in the haemoglobin concentration below the normal value for the age and sex. Anaemia reduces the capacity of the blood to carry sufficient oxygen and nutrients to the cells, tissues and organs of the body.[4,5]Anaemia can be classified as mild, moderate and severe based on the haemoglobin concentration in the blood cells.[4] Severe anaemia is when the haemoglobin concentration is less than 7gm/dl, Moderate anaemia is when it is between 7mg/dl to 9.9mg/dl and mild anaemia is when it is 10mg/dl to 11.9mg. Haemoglobin concentration of 12.0mg/dl and above is considered as a normal(reddy ba, who). [3,4,5]

Anaemia in children and adolescent constitute a major public health challenge worldwide affecting both developing and developed countries and this has major consequences for human health as well as social and economic development. [6] WHO estimates that a quarter of the worlds population(about 1.8 billion people) suffers from anaemia including half of preschool children.[7,8] The burden of anemia varies with a person's age, sex, altitude, and pregnancy.[1] The global prevalence of anaemia is 24.8%.[2] while the prevalence of anemia among adolescents is 15% (27% in developing countries and 6% in developed countries).[9]The World Health Organization (WHO) reports that the prevalence of anemia is the highest in children (42.6%) and the lowest in non-pregnant women (29.0%) while preschool children have a prevalence of 47.7%.[10]

The highest global prevalence of anemia is found in Africa (47.5%), followed by South-East Asia (35.7%) . Moreover, its prevalence is approximately 17.8% in the Americas, 14% in the United Arab Emirates and 11% in Egypt.[10]

In Nigeria, prevalence values of 71% have been reported in children under 5yrs of age and 32% for ages between 5yrs and 12 yrs[11,12,13]. others have reported prevalence rate as low as 15% .[8] Several studies worldwide and in Nigeria on anemia have been its association with nutritional status among preschool children mostly.

Anaemia has been attributed to various causes including infection (malaria, intestinal helminthiasis and chronic infection), nutritional deficiencies(Iron, Vitamin B12 and folate), haemoglobinopathy (Sickle cell anaemia, Thallasaemia) etc to mention a few. [1] A few studies have also studied the impact of intestinal helminthiasis on the nutritional status of children and have noted stunting was prevalent among some children with intestinal heminthiasis thas cause anaemia. [14,15,16]

Prevalence and Pattern of Anaemia among New Entry Students in a Secondary School in Warri, Delta State.

This study aims to determine the prevalence and pattern of anaemia among new entry students in a secondary school in Warri, Delta State. It is hoped that the information will increase the knowledge regarding anaemia in children and adolescent who are about to enter new institutions.

METHODOLOGY.

Study was a descriptive cross-sectional study involving 460 new entry students of a secondary school aged 9- 17yrs over a period of two months. Standard clinical protocols were used. They had their venous blood collected after consent was obtained from their guardian. The haemoglobin concentration and packed cell volume was analysed and catergorized into Normal, Mild anaemia, Moderate and Severe anaemia as stipulated by the World Health Organization(WHO)[5,7,17] .The results obtained were analyzed using the statistical software package (SPSS) version 19. Chi-Square test was used to determine the association between anaemia and sex in both children and adolescent. Statistical significance was set at $p < 0.05$.

RESULTS.

460 new entry students participated in this study, 59% female(272/460) and 41% males(188/460) with a mean age of 10.37yrs, mode 11yrs and median age of 12yrs.

52% (238/460) of the students were adolescents while 48% (222/460) were children.

The prevalence of anaemia amongst the new entry students was 30%(139/460). Prevalence among the children was while the prevalence among the adolescent is 26% .

More children (77) had anaemia compared to the adolescent(62).

The ages of 11yrs(41), 10yrs(32) and 14yrs(20) had the highest number of students with anaemia. The Mean age was 10.37yrs, Mode 11yrs and Median age of 12yrs.

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Prevalence of 26% (62/238) in adolescents aged 12-17yrs. Among males 18% (17/97) and among females 32% (45/141).

Table 1. shows the 30%(139) \of the students had anaemia while 70%(321) did not have anaemia. 97%(136) of those who had anaemia had mild anaemia while 3%(3) had moderate anaemia. None had severe anaemia. The prevalence of anaemia among the males students was 30% (56/188) and among the female students was 31%(83/272).

Anaemia status haemoglobin concentration	Male	Female	Total	Percentage	
Severe <7gms/dl	0	0	0	0	X2=0.028 df = 1 p-value = 0.868
Moderate 7-9.9gms/dl	1	2	3	1%	
Mild 10-11.9gms/dl	55	81	136	29%	
Normal >12gms	132	189	321	70%	
TOTAL	188	272	460	100	

TABLE 2. Shows that 52%(238/460) of the students were adolescents while 48% (222/460) were children. More children(77/222) had anaemia compared to the adolescent(62/238).

AGE	NORMAL	MILD	MODERATE	SEVERE	TOTAL	
9-11 yrs (Children)	145	75	2	0	222	X2=4.061 df=1 P-value 0.044
12-17YRS (Adolescent)	176	61	1	0	238	
TOTAL	321	136	3	0	460	

TABLE 3. Shows the distribution of anaemia based on the age of the students. The ages of 11yrs(41), 10yrs(32) and 14yrs(20) had the highest number of students with anaemia. The Mean age was 10.37yrs, Mode 11yrs and Median age of 12yrs.

AGE/YRS	NORMAL	MILD	MODERATE	SEVERE	TOTAL
9	9	4	0	0	13
10	67	32	0	0	99
11	69	39	2	0	110
12	25	11	1	0	37
13	60	19	0	0	79
14	55	20	0	0	75

15	31	9	0	0	40
16	5	1	0	0	6
17	0	1	0	0	1
TOTAL	321	136	3	0	460

TABLE 4. A The prevalence of anaemia among the children is 35%(77/222). Males had prevalence of 42%(38/90) while the females had prevalence of 30%(39/132).

Age 9-11yrs	Normal	Mild anaemia	Moderate anaemia	Severe anaemia	Total	
Male	52	37	1	0	90	X2=3.80 df=1 P-value 0.05
Female	93	38	1	0	132	
Total	145	75	2	0	222	

Table 4.B Prevalence of 26% (62/238) in adolescents aged 12-17yrs. Males had a prevalence of 18% (17/97) while females had a prevalence rate of 32% (45/141).

Age 12-17yrs	Normal	Mild Anaemia	Moderate Anaemia	Severe Anaemia	TOTAL	
MALE	80	17	0	0	97	X2=6.18 df=1 P-value 0.013
FEMALE	96	44	1	0	141	
TOTAL	176	61	1	0	238	

DISCUSSION.

Prevalence

The results showed a prevalence of anaemia of 30% among new entry students in a secondary school in Warri, Delta State. This is in keeping with the worldwide prevalence of anaemia in among children and adolescents in developing countries that stands at 27%.[12] However it is lower than studies done by Sumaiya et al [18] who had a prevalence rate of 40% and higher than that seen in studies done by Murti et al [6] and Ravishankar et al[19] who had 13% and 17.4% respectively. 70% of the students did not have anaemia and this is similar to the findings of Murti et [6] and Tesfaye et al[1] who had 86% and 85% respectively. This may be due to the fact that this study was done in a semi-urban area where majority of the guardian were middle class and educated as opposed to those who reside in rural areas with little or no formal education. Some other studies done in india had prevalence rate of 60% and above. [20]

For those who had anaemia, 97% (133/136) had mild anaemia while a 3% (3/133) had moderate anaemia and none had severe anaemia and this is in keeping with most of the studies done. [18,19] This was attributed to low level of education of the mothers, poor knowledge of mothers about infection control, low socioeconomic status and poor sanitary conditions including open urination and open defaecation. [13,21]

Pattern of distribution

More children (9yrs to 11yrs) had anaemia than the adolescent in general. This is in keeping with the report by WHO that the prevalence of anaemia is much higher in children and preschool children and the difference was statistically significant. Female adolescent were found to have anaemia more than their male counterparts and the findings were also statistically significant. This is similar to studies done in India in which they found higher prevalence among the female adolescent(ravis)[19]. In fact several studies done in India were specifically among the female adolescents. The major reason for this is thought to be because of menarche and menstrual challenges coupled with malnutrition, intestinal helminthiases and poor hygienic conditions.(let, hapreet)[20,22] Some studies attributed anaemia to low socio-economic status of the parents(madani). [23]

In study done by Nahid et al[24] among female adolescents, menarche was significantly associated with anaemia prevalence. Nearly all girls aged 14 and above had attained menarche, and anaemia was more common post menarche, likely due to increased iron demands during menstruation . Additionally, a history of menorrhagia was strongly associated with anaemia.

CONCLUSION.

This study screened 460 new entry students in a secondary school in Warri to determine the prevalence and pattern of anaemia. The overall prevalence of anaemia as found to be 30% and this constitutes moderate public health problem according to WHO.[1]

The distribution of anaemia was higher among the children than the adolescents while among the adolescents, females had more anaemia than males. The implication of this finding is that a proportion of students commence secondary education with compromised haematological status and this can affect academic performance if left unattended to. It is therefore recommended that

routine screening of new entrystudents should be performed. Policy makers are encouraged to ensure that the school health programmed are effective.

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