



## Prevalence of Intestinal Amoebiasis in School Age Children in Lafia, Nasarawa State, Nigeria

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### Abstract

*Amoebiasis has a worldwide distribution. It causes death, impairs the physical, mental and intellectual development thereby exerting tremendous impact on productivity of individuals especially the youngsters. This study determined the prevalence of amoebiasis in school age children in Lafia, Nasarawa State, Nigeria. One hundred and twenty (120) stool samples were examined for the cysts and/or trophozoites of Entamoeba histolytica using the direct smear and formol/ether concentration techniques. Thirty two (26.7%) of the samples were found to be positive for the parasite. The highest prevalence of 40.0% was recorded among children from Government Secondary School Tudun Kauri. There was no significant difference ( $P>0.05$ ) between the prevalence of amoebiasis among children examined from the various schools. Children within the age group of 6 -10 years old had the highest rate (31.%) of infection. Males (27.7%) were more infected than females (24.3%) proportionately. Pre-secondary school children had the least rate (16.7%) of infection as compared with those in secondary schools (20%). Improved sanitation, personal hygiene and deliberate policy for regular deworming of school age children by the government will decrease the rate of intestinal parasitic infections.*

**Keywords:** Amoebiasis, children, infection and hygiene.

### Introduction

Amoebiasis is a condition due to the infection by the protozoan parasite *Entamoeba histolytica*. The disease is still considered a major public health problem in developing countries of the world. It is recorded that 450 million persons are infected every year, with an incidence of 50 million, and 100,000 death tolls<sup>1,2</sup>.

Amoebiasis is widespread in its distribution, occurring in all parts of the world. The invasive amoebiasis is more prevalent in certain areas of the world including West and South-East Africa, China, the whole South-East Asia, Mexico and western portions of South America, and the India subcontinent<sup>3</sup>. Poor environmental sanitation, personal hygiene and overcrowding as well as ignorance are some of the major factors that influence the high incidence and prevalence of *E. histolytica* in these regions.

In Nigeria, amoebiasis is prevalent and widespread<sup>4</sup>. There have been several reports from various parts of Nigeria<sup>5-7</sup>, which recognized them as important health problems especially among young children. Several epidemiological studies have indicated a high prevalence of intestinal parasitic infections among Nigerian children<sup>8</sup>.

Infants under a year old are rarely infected with amoebiasis<sup>4</sup>. The incidence gradually increases during childhood and usually reaches its highest incidence in young adults<sup>9</sup>. Worm infestation

results in malnutrition, anaemia and retarded growth, they cause absenteeism in children of school age and affect their performance, other physical and mental health problems with serious consequences may occur and overall development<sup>10</sup>. Most of the affected population stay and carry out their home/domestic affairs in a very poor environmental condition<sup>11-13</sup>.

The high prevalence of *E. histolytica* infections is closely linked with poverty, poor personal hygiene, poor environmental hygiene, and poor health service providers having an inadequate supply of drugs and lack of adequate and proper awareness of the transmission mechanisms and life-cycle patterns of these parasites<sup>5,14,15</sup>. Children and pregnant women are mostly vulnerable to these infections<sup>14</sup>. School children, in particular, are good targets for mass-treatment programs against intestinal worms because they have the heaviest infections. Treating children has been shown to reduce transmission to untreated members of the community<sup>16</sup>.

Despite the high prevalence of amoebiasis in various parts of Nigeria, there is little or no information regarding amoebiasis in school age children in Lafia. It is in the view of these that this study was performed in Lafia, Nasarawa State, Nigeria to determine the prevalence of amoebiasis among school age children. The outcome of the study would help to provide basis for the development of control programme that can improve the health status of children, their home environment and personal hygiene.

## Material and Methods

**Samples Collection and Handling:** Permission for the work was obtained from the principals/Heads of the selected schools and also the education officer of Nasarawa State Educational Inspectorate Zone. Principals, teachers, and students of the selected schools were informed and consented as to the project and objective of this study.

One hundred and twenty (120) stool samples were randomly collected into sterile corked plastic tubes from students across 4 Schools in Lafia viz: Government Science School Lafia (GSSL), Government Secondary School Tudun Kauri (GSSTK), National High School (NHS) and St James Christian Academy (SJCA). The samples were labeled appropriately and then transported to the Biology Laboratory of the Department of Science Laboratory Technology, Nasarawa State Polytechnic, Lafia for laboratory analyses. Structured questionnaire was administered to each respondent.

**Examination of Stool Samples:** The stool samples collected were examined in batches using the formol/ether concentration techniques and the direct smear methods with normal saline and iodine solution<sup>17,18</sup>. The data obtained were analyzed using Chi-Square statistics.

## Results and Discussion

This study indicated that the prevalence of amoebiasis among school age children in Lafia is 26.7%. Thirty two (32) of the 120 stool samples examined were positive. The highest prevalence (40.0%) was observed in GSS Tudun Kauri while SJCA had the least prevalence rate (16.7%) (table 1).

**Table-1**

**Prevalence of Amoebiasis Among School Children in Lafia**

School No.	Examined	No. Positive	% Positive
GSSL	30	8	26.7
SJCA	30	5	16.7
GSSTK	30	12	40.0
NHS	30	7	23.3
<b>TOTAL</b>	<b>120</b>	<b>32</b>	<b>26.7</b>

Legend: GSSL; Government Science School Lafia, GSSTK; Government Secondary School Tudun Kauri, NHS; National High School, SJCA; St James Christian Academy

The distribution of the prevalence of infection among the various age groups showed that correspondents between the age group of 6 – 10 had the highest prevalence of 31.0% while the least prevalence rate of 16.7% was observed in the ages of <5 (table 2).

With respect to gender, males had the highest prevalence rate of 27.70% while females had the prevalence rate of 24.3% respectively (table 3).

**Table-2**

**Age Distribution of Amoebiasis among School Children in Lafia**

Biodata	No. Examined	No. Positive	% Positive
< 5	18	3	16.7
6 – 10	58	18	31.0
11– 15	33	9	27.3
16 >	11	2	18.2
<b>TOTAL</b>	<b>120</b>	<b>32</b>	<b>26.7</b>

**Table-3**

**Gender Distribution of Amoebiasis Among School Children in Lafia**

Sex	No. Examined	No. Positive	% Positive
Male	83	23	27.7
Female	37	9	24.3
<b>Total</b>	<b>120</b>	<b>32</b>	<b>26.7</b>

On the basis of School type, correspondents from secondary schools had the prevalence of 20% whereas those from pre-secondary schools had 16.7% (table 4).

**Table-4**

**Prevalence of Amoebiasis in Relation to School Type**

School Type	No. Examined	No. Positive	% Positive
Pre-Secondary	30	5	16.7
Secondary	90	18	20
<b>Total</b>	<b>120</b>	<b>32</b>	<b>26.7</b>

**Discussion:** The results obtained from this work showed that 32 (26.7%) of the 120 stool samples examined were positive for *E. histolytica*. At least multiple positive samples were obtained from all the schools. The prevalence of *E. histolytica* recorded in this study is quite higher than those obtained by some other researchers. A prevalence of 5.3% among school age children was recorded in India<sup>19</sup>. In Ishiagor of Abia State and Port Harcourt, Rivers State, Nigeria, prevalence rates of 3.1% and 11% were recorded among children respectively<sup>20, 21</sup>.

The high prevalence of amoebiasis recorded in this study can be attributed to poor environmental/drainage system, unhygienic methods of disposing sewage, shortage of good water supply, indiscriminate defaecation as well as very low standard of personal hygiene in the study area and among school children. These enhanced the transmission of this parasite as the children mingle with one another since the transmission is mainly by faeco-oral route<sup>13</sup>.

The highest prevalence of amoebiasis (40.0%) from this study was recorded in children attending Government Secondary School Tudun Kauri, Lafia. The reason for this high prevalence may be as a result of location of the school, been in a sub-urban area. The major occupation of parents/guardians of these children is farming. Most of these children go to farm barefooted and work a lot in sand with crude tools and they are

also careless about personal hygiene. More so, the level of infection is high because, during planting season flies carry foods contaminated with faecal material from one place to another. It also confirms that parasitic disease transmission depends on poor environmental conditions and personal hygiene<sup>22</sup>.

Among the four age category represented in this study, the highest prevalence was recorded among those within 6-10 years old whereas the least was among those within <5 years old. The reason for the low occurrence of *E. histolytica* in under 5 children can be attributed to their innate resistance due to the induced production of secretory immunoglobulin A (Sig A) that can diminish the adhesion between *E. histolytica* trophozoites epithelial cells, hence reducing new infection<sup>23</sup>. Also, the lack of antitrophozoite IgG and the acquired resistance due to intestinal IgA against the carbohydrate recognition domain of *E. histolytica* galactose N-Acetyl D-galactosamine lecithin is responsible for the partial immunity enjoyed by the under fives<sup>24</sup>.

The high prevalence rate of 31.0% recorded among children between age group 6-10 shows a common pattern of behaviour and susceptibility to infection. They play a lot on the sand with little or no care, and they are not old enough to understand the advantages of general cleanliness and about personal hygiene. The age-groups of 11-15 and 16 > recorded lower rate of infestation, this is because of the maturity they now have as compare with the aforementioned age groups.

The prevalence of *E. histolytica* by sex showed no meaningful difference and it is in line with the report of some researchers<sup>25</sup>.<sup>26</sup>. They maintained that both sex have the same chance of contracting the disease. In as much as boys go barefooted during games and girls do so in most of their games<sup>22</sup>. This is not surprising especially when one notes that both genders live in the same community and generally engage in similar activities such as fishing, farming, trading and are hence exposed to the same hazards continually.

With respect to the school type, children from the pre-secondary school had the least level of infestation as compare to those in the secondary schools who had a higher rate of infestation. The reason for this variation might be due to the fact that older children in such schools are very adventurous and were seen to engage activities which necessitate more contact and exposure, because they are more matured to engage in activities such as fishing, swimming and irrigation than those of the lower age.

## Conclusion

In conclusion, this study is a contribution to the epidemiological survey of amoebiasis in Lafia, Nasarawa State of Nigeria, as it revealed a relatively high prevalence of amoebiasis among school children. Therefore, mass chemotherapy and integrated measures of parasitic control would be of utmost importance in reducing the level of infections among children. A more

elaborate study including adults is recommended. The findings will help to improve the health care delivery system in this part of Nigeria.

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