

PREVALENCE OF ASCARIASIS AMONG CHILDREN IN ANYIGBA COMMUNITY DEKINA LOCAL GOVERNMENT AREA, KOGI STATE, NIGERIA

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ABSTRACT

Ascariasis occurs in rural areas, is one of the most common helminthic human infections worldwide. Highest prevalence in tropical and subtropical regions, and areas with inadequate sanitation. Ascariasis has a worldwide distribution. It causes death, impairs the physical, mental and intellectual development thereby exerting tremendous, impact on productivity of individuals especially the future leaders of tomorrow. This study determined the prevalence of Ascariasis among Primary school children in Anyigba community, Kogi State, Nigeria. A total of 640 stool samples were examined using formal ether concentration techniques and also four different hospital records of 530 diagnosed helminth cases were collected. Out of the 640 school children examined (43.59%), likewise out of the 530 diagnosed hospital cases (47.74%) harboured *Ascaris lumbricoides*. Prevalence among male (45.10%) were higher than that of the female (41.91%). The age group between 7 – 9 years had the highest prevalence in both stool samples and hospital diagnosed cases (55.17% and 73.55% respectively) and the infection reduced as age increased. Data acquired from this study are closely correlated with a direct effect of lack of sanitation, poverty, ignorance, poor environmental hygiene and personal hygiene, shortage of potable water, indiscriminate defecation and impoverished health services. Hence targeted treatment of children with antihelminthic drugs regularly, public enlightenment for school children, parents and teachers on the modes of transmission and prevention helminthes (*A. lumbricoides*) infections is needed.

Keywords: Ascariasis, Environment, Sanitation and Antihelminthic.

INTRODUCTION

Ascariasis, the most common human intestinal worm infection, caused by the parasitic helminth worm “*Ascaris lumbricoides*”, a family of parasites known as the soil-transmitted helminthes (1,2) locally called ‘Idenekwu eilile’ in Igala. It infects vast number of human hosts causing chronic disease and morbidity (3). The World Health Organization (4) estimates that more than one billion of the world population is infected with heminth, out of which about 800 million people worldwide are infected with *A. lumbricoides*. Ascariasis associated conditions include intestinal occlusion/intestinal obstruction, vomiting, weakness and stomach pain; it also contributes to infant malnutrition leading to infant expiries every year, it can be asymptomatic with low worm load even

in communities where the prevalence is high and symptomatic with weighty worm load (5), and is sometimes detected by observing the presence of egg/worms in the stool. However, when symptoms occur, they relate either to the larval migration stage or to the adult worm intestinal stage. As larval stage travel through the body, could result in complications such as visceral damage, peritonitis and inflammation, enlargement of the liver, or spleen and pneumonia (6, 7). Intestinal parasitic infections are major health problems in developed and under developed nations, especially among school aged children (8). The majority of people with ascariasis live in Asia (73%), Africa (16.7%), South America (8%), North America (2%). In tropical Nigeria, it is a common and major health concern among children living in rural areas where prevailing predisposing factors to the para-infections exist such as poverty, poor sanitations, ignorance, contaminated food or water, eating habits that involve the consumption of raw vegetables, fish, crustaceans and meat, habit of children playing on the sand, environmental hygiene and malnutrition (9,10). Thus *Ascaris* is unlikely to jump from person to person unless people do not practice hygienic toilet behaviour and its eggs may be carried on cloths, picked up in farm soil, playground or roads contamination with faeces from an infected person (11). A number of features accounting for its high prevalence including a ubiquitous distribution, the durability of eggs under a variety of environmental conditions, the high number of eggs produced per parasite, and poor socio economic conditions that facilitate it's spread. The highest risk prevalence of morbidity of *A. lumbricoides* infection are primary school children between ages of 4 and 9 and pregnant women (12, 13, 14) because their immunity to parasite infections has not completely developed at the age. These observations are in agreement with the work of Okon and Oku (15) who recorded higher prevalence of parasite infections in younger children. In children, negative effects of *A. lumbricoides* infections include growth retardation, anaemia, delayed intellectual development, high school absenteeism, Iron and vitamin A deficiency and cognition (16, 17). Majority of children in Nigeria from low socio-economic class has been found to be anaemic, stunted with retarded growth and under-weight as result of malnutrition (18). Severity of the disease has consistently been found to depend on the number of worms present per person.

MATERIALS AND METHODS

STUDY AREA

The study was conducted in Anyigba community, Dekina Local Government area Kogi State. The town is situated on latitude 8043' and 9015' south of equator and longitude 6006' and 7045' west of the meridian and it is located 120KM east of Lokoja, the state Capital. Anyigba shares common boundaries in the North with Ajiolo, Abocho and Biraidu, and South with Abejukolo-egume, and Ofakaga. Anyigba fall within the southern Guinea Savannah with no portable water supply, the main source of water for the populace is River Oganaji and mobile water tankers.

STUDY POPULATION

The target population for the study was school pupils between the age of 4 and 12 from four schools and four hospitals using the random sampling within Anyigba Community (19). The schools are LGEA Primary School Igi, LGEA Primary School Ajetachi, RCM Primary School Agala-ate, and CMML Primary School Abuja Area, the hospital visited for reported and diagnosed cases of helminthic parasite (*Ascaris*) were Kogi Diagnostic, Grimard Catholic hospital, Maria-Goretti hospital and Pacific hospital. A total of 640 stool samples were collected from school

children/pupils randomly. Verbal consent was sought and received from the authorities in charges of the four schools and hospital before stool containers were distributed to subjects and hospital records of cases was assessed.

SAMPLE COLLECTION

The pupils were supplied with specimen container labelled with serial number, name, age and sex. The pupils were trained on how to collect the stool using the container and applicator sticks. They were instructed to collect the stool specimen at the next morning after which it was taken to the laboratory in the afternoon for analysis the same day. The faecal specimens were examined macroscopically and microscopically in the laboratory. The parasitological technique used for the analysis is formal ether concentration technique (20,21). 7ml of 10% formal saline was transferred to a centrifuge tube in which was put 1g of the stool specimen. This was mixed gently and strained using a sieve. Faecal debris and the suspension transferred to another test tube containing 2-3ml of formal-ether. The mixture was thoroughly shaken after closure with a stop cork, and then centrifuged at 1500g for 5minutes to form four layers of suspension (formal ether, faecal debris, formal saline and stool sediments). The first three layers were decanted and a drop of the fourth layer placed on a clean grease-free glass slide, and covered with a cover slip and examined under high dry objective x10 and x100 respectively. A drop of lugol's iodine was added to each slide to provide for clarity of cysts if any (22). Four major Hospitals laboratory record department were visited for reported and diagnosed cases of helminthic parasite (especially *A. lumbricoides*) between 2008 to 2011 for the number examined and number positive for *A. lumbricoides*. These hospitals are Kogi Diagnostic, Grimard Catholic hospital, Maria-Goretti hospital and Pacific hospital

STATISTICAL ANALYSIS

The data obtained in the study were represented on tables interpreted in percentages and analysed with respect to ages of pupils examined, sex of the pupils and prevalence of *A. lumbricoides* parasites among children in Anyigba community.

RESULTS

Double-entry programs i.e stool samples complete information and hospital diagnosed cases were used to analysed data in order to reduce error. A total of 640 pupils provided proper stool samples and complete information. Of the total of 640 stool samples examined 279(43.59%) were infected by *Ascaris lumbricoides* (ova and worm) (Table 1). Males 152(45.10%) were generally more infected than females 127(41.91%).The infections were high in 7 – 9 years group in both males and females withprevalence rates of 60.77% and 48.04% among males and females respectively. The general prevalence of Ascariasis among children in selected school in Anyigba are given in Table 2 with LGEA Primary School Ajetachi and LGEA Primary School Igi recorded the highest rate of infection 56.25% and 53.75% respectively, while CMML Primary School Abuja Area and RCM Primary School Agala-ate recorded low infection rates among children with 41.88and 22.50%, respectively. (Table 3) shows that pupils who use bush had the highest prevalence (40.63%) followed by pupils using pit latrine of (30.78%) and least are pupils using water system (28.59%).

Table 1. Total prevalence and intensity of *Ascaris lumbricoides* infections by age and sex.

| Age | NO. Examined | NO. Male Infected | % | NO. Examined | NO. Female Infected | % | Overall | | |
|-------|--------------|-------------------|-------|--------------|---------------------|-------|--------------|-------------|-------|
| | | | | | | | NO. Examined | NO Infected | % |
| 4-6 | 119 | 46 | 38.66 | 101 | 41 | 40.59 | 220 | 87 | 39.55 |
| 7-9 | 130 | 79 | 60.77 | 102 | 49 | 48.04 | 232 | 128 | 55.17 |
| 10-12 | 88 | 27 | 30.68 | 100 | 37 | 37.00 | 188 | 64 | 34.04 |
| TOTAL | 337 | 152 | 45.10 | 303 | 127 | 41.91 | 640 | 279 | 43.59 |

Table 2. Prevalence of *A. lumbricoides* infections among children per school in Anyigba

| School | N* | NO Infected | % Prevalence |
|--------------------------------|-----|-------------|--------------|
| CMML Primary School Abuja Area | 160 | 67 | 41.88 |
| LGEA Primary School Ajetachi | 160 | 90 | 56.25 |
| LGEA Primary School Igi | 160 | 86 | 53.75 |
| RCM Primary School Agala-ate | 160 | 36 | 22.50 |
| TOTAL | 640 | 279 | 43.59 |

* Number of school children examined

Table 3. Prevalence of *A. lumbricoides* according to sanitary condition.

| Toilet levels | No. examined | % prevalence |
|----------------------|--------------|--------------|
| Surface latrine/bush | 260 | 40.63 |
| Pit latrine | 197 | 30.78 |
| Water system | 183 | 28.59 |

Prevalence of ascariasis based on hospitals records showed infection rate of 47.74% with total reported cases of 530 examined (271 males and 259 females), out of which 253 were positive for *A. lumbricoides* (152(56.09%) males and 101(38.99%) females) (Table 4), diagnostic hospital recorded the highest infection rate of 61.71% (Table 5).

Table 4: Total prevalence of *Ascaris lumbricoides* infection by age and sex Based on Four (4) Hospitals Records.

| Age | No examined | No infected | | Total no infected | % prevalence |
|----------|-------------|-------------|-----|-------------------|--------------|
| | | M | F | | |
| 4-6 | 76 | 18 | 10 | 18 | 36.84 |
| 7-9 | 121 | 53 | 36 | 89 | 73.55 |
| 10-12 | 135 | 44 | 29 | 73 | 54.07 |
| 13 above | 198 | 37 | 26 | 63 | 31.82 |
| Total | 530 | 152 | 101 | 253 | 47.74 |

Table 5: Prevalence of *A. lumbricoides* infections among children per selected Hospitals Records in Anyigba

| Hospitals | Males | | Females | | Total | | % prevalence |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| | No examined | No infected | No examined | No infected | No examined | No infected | |
| Diagnostic | 113 | 88 | 109 | 49 | 222 | 137 | 61.71 |
| Maria-goretti | 42 | 17 | 45 | 17 | 87 | 34 | 39.08 |
| Pacific | 70 | 29 | 55 | 20 | 125 | 49 | 39.20 |
| Grimard | 46 | 18 | 50 | 15 | 96 | 33 | 34.38 |
| Total | 271 | 152 | 259 | 101 | 530 | 253 | 47.74 |

DISCUSSION

The study revealed a high prevalence of ascariasis among children in Anyigba community with overall prevalence of 43.59% (stool samples) and 47.74% (hospital record). The result of this survey has added to the store of knowledge on the occurrence of most STHs *A. lumbricoides* in Nigeria. Data acquired from this study are closely correlated with a direct effect of lack of sanitation, poverty, ignorance, poor environmental hygiene and personal hygiene, shortage of potable water, indiscriminate defecation and impoverished health services (23,24). The overall prevalence recorded is in conformity with others studies in some parts of Nigeria, Egwunyenga and Ataikiru (48.41%); Ijagbone and Olagunju (46.0%); Chioma et al., (25) (46.4%); Ukpai and Ugwu, (26) (47.01%); Higher than the work of Ogbe et al., (27) (33.0%); Eneanya and Anikwue, (28) (37.20%); Biu and Harry, (29) (38.99%); Biu et al., (30) (72.0%) in school children and non-school children in Nigeria. Previous studies, Akogun and Badaki (31); Awogun et al., (32) and Fashuyi, (33) reported a high prevalence among children resident in Gumau District of Adamawa State; Ilorin and Ibadan respectively.

From this survey children between the age group of 5-7 years had the highest prevalence of (73.55% hospital record and 55.17% stool samples) which agrees with Stephenson et al., (34). This age group usually experience rapid growth and development and are very active. The high prevalence observed in this age could be attributed to higher exposure to the source of infection through their behavioral activities such as walking barefooted, picking things from the floor to the mouth, indiscriminate defecation in and around the school surrounding and bushes, and the habit of not washing hands properly with soap and water before meals and after using the toilet (35) and Mbanugo and Onyebuchi (36); Gundiri and Okwuosa (37) who reported a prevalence of 46.7% in the defunct Bendel State, Nwosu et al., (38, 39). Hencetargeted treatment of children with antihelminthic drugs should be regular.

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