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## Comparative Assessment the Prevalence of Ascariasis among Primary School Pupils

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### **Abstract:**

A study was conducted to ascertain the state of Ascariasis among pupils in Nursery and Primary Schools in Ankpa Local Government Area of Kogi State. Faecal samples were obtained from 150 Pupils in 5 Nursery and Primary Schools. From the result, the sex prevalence was higher in female than in male, which is 52% and 36% respectively. It also indicated that the age group 6 – 14 has higher prevalence than 15 and above, which is 20% and 10% respectively. There was no significant difference in the prevalence of infection between males and females. From questioner, the prevalence in relation to toilet facility showed that highest rate of infection is recorded in users of Pit Latrine 22%, followed nearby bush 16% and Water closet 6% the prevalence in relation to source of Drinking water includes 12% for Borehole, 10% stream, 10% for Pipe born water, 8% for reservoir and 8% for packet water, respectively. The study indicated high prevalence of Ascariasis among Primary School Pupils. The need for health education, intermittent deworming, provision of infrastructural amenities and need for improved faecal disposal facilities.

**Keywords:** Prevalence, *Ascaris*, Ascariasis, Pupils.

### **1. Introduction**

Ascariasis is a human diseases caused by the parasitic nematode called *Ascaris lumbricoides*, the worm is an intestinal parasite, that cause one of the most common worm infections worldwide. Ascariasis is particularly prevalent in tropical regions and areas of poor hygiene (WHO, 2011). Nearly 13 million children die each year in developing countries and majority of cases are attributed to worm infestation (Tomkins and Watson, 1989). Ascariasis is very prevalent in Nigeria especially in children with 31/32 antigen (Holland *et al* 1996). In Nigeria considerable amount of human and animal waste is discharge into the soil daily leading to the seeding of the soil with pathogens including eggs and larva of *Ascaris lumbricoides* in the soil become the major source of infection particularly to children. However, the degree of each factor and the prevalence of infection vary from one region to another (Ogbe *et al.* 1990, 2002). The rate of infection is higher among children between age 5 – 14, than it is in adults, this is related to the mode of transmission in which children are most exposed to the parasite as a result of unhygienic habits—non washing of hands after defecation, biting of nails contaminates with soil (Gundiri and Okwuosa, 2005). Age – target programme that deliver chemotherapy through schools, ranks the most cost effective of public health intervention (Nwaorgu *et al.* 1998) The study is to determine the effect of socio economic background and poor sanitation on the prevalence of Ascariasis. It is also to determine age and sex prevalence of Ascariasis in the study area.

#### *1.1. Life Cycle of A. lumbricoides*

Man acquires infection by ingestions of food, water or raw vegetables contaminated with embryonated eggs. In the small intestine (Duodenum) the ingested eggs hatch to liberate the larvae. These larvae then borrow their way through the mucous membrane of the small intestine and are carried by portal circulation to the liver, where they reside for 3 – 4 days. They then pass via hepatic vein, inferior vena cava, right heart though pulmonary artery to the lungs. Here they grow to size and moult twice (first on the 5<sup>th</sup> day and second on the 10<sup>th</sup> day. This then break through capillary wall and move to the bronchi, trachea and Larynx, crawl over the epiglottis to the pharynx and are swallowed. They pass down the oesophagus and stomach and localize in the upper part of the small intestine, their normal abode. On the twenty fifth to twenty ninth day of infection, the larvae undergo another moulting and transform into adult worms. In about 6 – 10 weeks the gravid females begin to discharge eggs in the stool and the life cycle is repeated (Arora and Arora, 2013)

### 1.2. Epidemiology

It is estimated that more than 1.4 billion people are infected with *Ascaris lumbricoides* representing 25% of the world population. (Harbay *et al*, 2010). The highest prevalence of Ascariasis occurs in the tropics where warm, wet climates provide favourable environment for year round transmission of the infection.

### 1.3. Pathology

Pathological mechanism includes:

Direct tissue damage by migrating larvae.

Immunologic responses of the host to infections with larvae, eggs or adult worms.

Obstruction of orifices or the lumen of the gastro intestinal tract by aggregated worms.

Nutritional sequel resulting from infection (Khuroo, 1996).

### 1.4. Diagnosis and Treatment

The diagnosis of Ascariasis is usually by stool microscopy, other diagnostic measures includes eosinophilia, imagine, ultrasound and serologic examination (Arora and Arora, 2006, Cheesbrough, 2005). Treatment of Ascariasis is by chemotherapy using anti-helminthic agent like Ivermectin, Piperazine citrate, Ivermizole, Albendazole and Mebendazole (WHO, 2004).

## 2. Materials and Methods

### 2.1. Study Area

Ankpa town is located in Ankpa Local Government Area of Kogi State situated in Umabolo valley, it is located between latitude 7<sup>0</sup> 6'N and 7<sup>0</sup> 41'N of the equator and longitude 7<sup>0</sup> 22'E and 7<sup>0</sup> 51'E of the meridian. Ankpa town is one of the busiest commercial centers in Kogi State with a population of 267,353 people and it remains one of the largest or most populated Local Government Areas within Kogi State 14. The study area falls within the tropical grassland in the Middle belt region of Nigeria. The vegetation is guinea savanna with scattered trees. It has two alternating wet and dry seasons. The settlement pattern is nucleated type in which buildings are so compacted or clustered due to high population density. Structured questioners were given to all the pupils involved in the study to ascertain the type of toilet facility available to them in their various homes.

### 2.2. Sample Collection

The pupils involved were provided with sterile universal bottles labeled with masking tape with sex, age and class of the pupils written on it. Simple floatation method was used to isolate ova of the parasite from the samples 6; 150 faecal samples were collected at random from 75 males and 75 females in the sample schools.

### 2.3. Procedure

A few grams of the faecal sample was taken from different samples collected from the various schools and then put in a universal bottle and emulsified and the mixture sieved into a beaker to remove coarse particles and rinse the coarse particles in a saturated solution and discarded. The filtrate was filled to the brim to form the cover meniscus and covered with a clear glass slide. It was allowed to stand for about 25 minutes and the glass slide was removed, it was covered and mounted using x10 and x40 objective lens to identify the egg, cyst and larvae of the parasite 6.

### 2.4. Analysis of Data

The data was presented in tables in percentage and chi-square was used to prove for significant difference. The chi-square was used to determine if the observed frequency of occurrence of any value conforms to the expected frequency of any value.

$$\text{Percentage} = \frac{\text{Total number infected} \times 100}{\text{Total number examined}}$$

$$\text{Chi-square} = \frac{(O - E)^2}{E}$$

Where, O = the observed frequency of any value

E = The expected frequency of any value

$$\text{Expected (E)} = \frac{\text{Row total} \times \text{column total}}{\text{Ground total}}$$

### 3. Results

Age in year	MALE			FEMALE			TOTAL		Prevalence %
	No. examined	No infected	% infected	No examined	No infected	% infected	No examined	No infected	
	75			75			150		
0-5	24	9	6	30	12	8	54	21	14
6-14	30	12	8	21	18	12	51	30	20
15--	21	9	6	24	6	4	45	15	10
total	75	30	20%	75	36	24	150	66	44

Table 1: Age and Sex Prevalence of Ascariasis.

Table 1 shows age and sex prevalence of Ascariasis. The age related prevalence in this study was grouped as 1 – 5 (14%), 6 – 14 (20%) 15 and above (10%). The highest prevalence was observed in the age group 6 – 14 years. The prevalence is higher among females than the male pupils. The chi square test difference of Ascariasis infection in relation to age group was  $X^2$  with P. value of 0.05 and degree of freedom of 1 – 3.841, which is greater than the value calculated (0.6) this implies that there is no significant difference between the age group.

Toilet facility	MALE			FEMALE			TOTAL		Prevalence %
	No. examined	No infected	% infected	No examined	No infected	% infected	No examined	No infected	
Pit latrine	35	18	12	33	15	10	66	33	22
Water closet	18	3	2	18	6	4	36	9	6
Nearby bush	14	6	4	24	18	12	48	18	16
Total	75	27	18	75	39	26	150	66	44

Table 2: Prevalence of Ascariasis in Relation to the type of Toilet Facilities.

Table 2 shows the prevalence of Ascariasis in relation to toilet facilities: pit latrine (22%) 33 pupils, water closet (6%) 9 pupils, and nearby bush (16%) 8 pupils. Those who pit latrine have the highest prevalence.

### 4. Discussion

The results obtained from this study are consistent with a direct effect of lack of sanitation and low level socio-economic status on the prevalence and intensity of Ascariasis. The difference in prevalence rate among the various schools sampled was not very significant and the high prevalence rate could be due to lack of good toilet facility and poor hygiene habits such as walking bare footed, non-washing of hands, poor eating habit and other care free habits of children. The results show that the age group 0-5 and 6-14 recorded higher prevalence rate 14% and 20% respectively. This indicates a common pattern of behaviour on activities and susceptibility for those groups. Children within that age group probably spend more time in water swimming and fishing in polluted ground or water bare footed (Alakija, 1986). The prevalence of the infection was observed to be on the decline in children above 15 years, because at this age they are becoming more conscious of personal hygiene due to education and health awareness received. The result also indicated higher risk in females than male pupils; this according to Baird et al 1996, could be because females have large surface area of genital opening which allows easy entry of the parasite ova, during defecation that the risk of Ascariasis is probably greater in fields than the houses.

#### 4.1. Conclusion

The results and observation revealed that faecal contamination of water; soil and fruits are all responsible for the spread of Ascariasis. Poverty may also be implicated in the prevalence rate of Ascariasis, since the use of soap in hand washing after defaecation is considered an additional cost even by the school or street food vendors who have the awareness on need for hygiene practice. Ascariasis is independent of sex and growth status but dependent on age and socio economic status of pupils. It has detrimental effect on academic performance and makes people vulnerable to other diseases.

#### 4.2. Recommendation.

It is strongly recommended that adequate social amenities such as portable water affordable and ethically acceptable means for disposal and treatment of human faces should be provided for the schools to enhance effective control of Ascariasis.

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