Efficacies of Ivermectin and Praziquantel Treatment on Intestinal Helminthiases among Primary School Children in Ihiala, Anambra State, Nigeria

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Abstract

Studies to determine the efficacies of Ivermectin and Praziquantel (anthelmintics) in the treatment of intestinal helminthiasis among primary school children in Ihiala, Ihiala L.G.A were conducted from April to September 2012. Consent was obtained from the Local Government Health Authority and Head of various schools. Direct saline wet mount technique and floatation technique were used to examine the stool samples for helminth parasites. Of the 200 subjects examined, 117 were infected giving a prevalence of 58.5%. The 0-15years examined had different intestinal helminthiases namely; Anclostoma duodenale, Ascaris lumbricoides and Taenia saginata. A total number of 73 (36.5%) were cured using the drugs. Helminth infections in the order of prevalence were; Ascaris lumbricoides (21.5%), Ancylostoma duodenale(16.5%) and Taenia saginata (20.5%). The highest prevalence of 90% was observed in the 13-15 years age group. The males were infected more than the females. The anthelmintic drugs used in the study were effective against the intestinal helminth parasites. The promotion of better environmental conditions and placing greater emphasis on health education with respect to personal hygiene, deworming programme and good eating habits will enhance the control and prevention of common parasitic infections in Ihiala and Nigeria at large.

Key Words: Efficacy, Helminthiasis, Intestinal, Ivermectin and Praziquantel.

Introduction

Drug is a substance that can change how an Organism works. The World Health Organization has recommended community-wide treatment of helminthes infections. Virtually all of the important parasitic helminthes in humans can be treated with one or combination of the five most currently used anthelmintics: albendazole, mebendazole, ivermectin, praziquantel and diethylcarbamazine. The aim of anthelmintic therapy is to reduce the intensity of infection below the level of clinical significance. However, measures must also be taken to avoid the emergence of resistance against the available therapies.

Intestinal helminth parasites are the most prevalent human infections affecting approximately one quarter of the world‘s population, mainly school children due to their poor hygienic nature or poor sanitary conditions coupled with their voracious eating habits (WHO, 1987).

The prevalence of human intestinal helminth parasites in urban areas of Nigeria has been documented (Ejezie, 1981) but very little is known of the prevalence in the rural communities. Therefore research work is to determine the efficacies of ivermectine and praziquantel (anthelmintics) in human intestinal helminth parasites among primary school children in Ihiala Local Government Area, Anambra State.

Materials and Methods

Study Area

Ihiala Local Government Area is the Headquarter of Ihiala Town (5^{o},52 N and 6^{o} 50 E) is made up of 10 rural communities namely; Ihiala, Okija, Uli, Azia, Amorka, Mbosi, Isseke, Lilu, Orsumoghu and Ubuluisiuzo. The indigenes are predominantly Ibo and their major occupations are farming and trading. There are also public servants, teachers and students in the Local Government Area. The community habours two major tertiary institutions. The vegetation of the area is tropical rainforest. The two distinct seasons in the area are wet season from July to September and dry season from December to March. As a result of Human and Wildlife interference the superficial water bodies, indiscriminate refuse disposal and poor drainage accounts for the poor sanitation and thus, enhances the dissemination of parasitic infection.

Collection of Samples

For ethical consideration, the Head of communities, principal and headmasters of schools were contacted for enlightenment and permission. Samples were collected randomly from a total number of two hundred pupils. This was done randomly to avoid bias. The selected pupils were given wide mouthed sterilized stool container with labels for age, sex, name and occupation. They were instructed to collect stool sample at home in the morning of the following day and return immediately for examination in the laboratory.

Parasitological Techniques

1. The parasitological technique used for sample analysis includes;
2. Direct Macroscopic Examination of Faeces
3. The fecal samples were first examined macroscopically for;
    - Color
    - Appearance
    - Mucus
    - Consistency
    - Adult parasite/ worm segment.

Floatation method/technique as described by (Chessbrough, 2005) was used to analyze the fecal sample. In each case, on a greese free clean slide (1½x3inch), a drop of Normal saline was placed and small quantity of faeces (2mg) covered with cover slip. Three different species of intestinal helminth parasite eggs were identified by microscopy.

Post-Treatment Examination

Children whose stool samples contain the helminthes ova were given two tablets each of the drug as single dose according to pharmaceutical prescription. They were to produce additional stool samples after 7days.

Results

Out of 200 subjects that were examined for intestinal helminthes parasites, 117 (58.5%) were found positive. Table.1.shows the prevalence rate of the intestinal helminthes parasites found; *Ancylostoma duodenale* (16.5%), *Ascaris lumbricoides* (21.5%) and *Taenia saginata* (20.5%). 13-15 years age group had the highest prevalence of 90% while the 0-4 years age group had the least prevalence of 33.3%. Out of 117 subjects infected, 73 (36.5%) were cured using English drugs. The differences in prevalence between the different age groups were statistically significant ($p<0.05$).

Table 2 shows that 74% of the males were infected while 43% of the females were infected. Out of the 74% of the infected males, 45% were cured using the drugs while 28% out of the 43% infected females were also cured using the same drugs. It would thus appear that males tend to be more infected than the females. There was significant associated between the sex and prevalence of intestinal helminthes parasites ($p<0.05$). Table 3 shows the cure rate of the drugs (ivermectin and praziquantel) on the human intestinal helminthes parasites. Ivermectin recorded the highest cure rate of 31.5% while praziquantel recorded 27.0%. Praziquantel has its highest cure on *Taenia saginata* (11.0%), while Ivermectin had the highest cure on *Ascaris lumbricoides* (16.0%).

Table 1. Efficacies of Ivermectin and Praziquantel in Human Intestinal Helminthes by Age Specific

AGE	Total No examined	Total No +ve and %	*Ancylostoma* No +ve & %	*Ascaris* No and % +ve	*Taenia* No and +ve %	Total cured %	Total uncured %
4-6	30	10(33.)	5 (16.7)	3 (10.0)	2 (6.6)	4 (13.3)	6 (20.0)
7-9	80	31(38.)	6 (7.5)	7 (8.8)	18(22.5)	18(22.5)	13(16.3)
10-12	70	58(82.)	18 (25.7)	28(40.0)	12(17.1)	40(57.1)	18(25.7)
13-15	20	18(90.)	4 (20.0)	5 (25.0)	9 (45.0)	11(55.0)	7 (35.0)
Total	200	117(58.5)	33 (16.5)	43(21.5)	41(20.5)	73(36.5)	44(22.0)

Table 2. Efficacies of Ivermectin and Praziquantelby Sex

Sex	Total No. examined	Total No +ve & %	*Ancylostoma* No % +ve	*Ascaris* No % +ve	*Taenia* No % +ve	No cured %	No uncured %
Male	100	74(74.0)	23 (23.0)	19(19.0)	32(32.0)	45(45.)	29(29.)
Female	100	43(43.0)	10 (10.0)	24(24.0)	9 (9.0)	28(28.0)	15(15.0)
Total	200	117(58.5)	33 (16.5)	43(21.5)	41(20.5)	73(36.5)	44(22.0)

Cure Rates of Ivermectin and Praziquantel on Human Intestinal Helminthes

Helminthes Parasites	Total No infected and %	Total No cured By Ivermectin	Total No cured By Praziquantel
Ancylostoma duodenale	33 (16.5)	12(60.0)	21(10.5)
Taenia saginata	41 (20.5)	19(9.5)	22(11.0)
Ascaris lumbricoides	43 (21.5)	32(16.0)	11(5.5)
Total	117 (58.5)	63(31.5)	54(27.0)

Discussion

Table 1, presents the prevalence of helminthes which demonstrated a lower prevalence of both tapeworms and hookworms and a higher prevalence of roundworms in primary school children in the four schools in Ihiala. Infection rate of 58.5% was observed among the samples used in the study. This might be described as a moderate infection rate considering the warm and wet weather of the period of study, which provided suitable conditions for propagation of the parasites. *Ascaris lumbricoides* had a comparatively higher prevalence than the hookworms and tapeworms. The result conforms to those of Nwosu and Anya, 1981 which showed that *Ascaris* was one of the most prevalent parasites in Nigeria and also the most common in children. Its prevalence was restricted to children between the ages of 4-15 years. This was due to the fact that children within this age group are fond of licking and may contaminate their fingers with *Ascaris* ova while playing on open fields or grounds. Due to the aggressive nature of the boys, they are more prone to re-infections as evident from their statistically higher intensity of helminthes infections. In Table 2, the males were more

prone to the intestinal helminth infections than the females. This conforms to that of Ekemezie (2010), which showed that the boys are more aggressive and explorative than the girls which makes them more prone to re-infection as evident from their statistically higher intensity of helminthes infection. In Table 3, the results obtained from the study on the cure rates showed that Ivermectin has greater anthelmintic properties against intestinal helminthes than Praziquantel. Although Praziquantel shows characteristic cure on *A. lumbricoides* and *A. duodenale*, it shows is greatest effect on *Taenia*. This is in reference to that of Matthaiou (2008) which shows that praziquantel is abroad-spectrum drug of Taenia.

Conclusion

English drugs are known to be the most effective anthelmintics against all kinds of intestinal helminthes parasites. Some of them expel the living worms while others lyse the worms in the intestine and are passed out through faeces. There is still need for further studies, especially on their mode of action to extend the present observations to field application.

This study serves as a preliminary work to add to the already existing literature on the effects of English drugs on intestinal helminthes.

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