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Biology and Medicine

Research Article

Investigation on the Pattern of Intestinal Parasites Present in Refuse Dumps and Abattoir Wastes in Ile-Ife, Nigeria

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ABSTRACT

This project work focuses on the investigation of pattern of intestinal parasites present in refuse dumps and abattoir wastes in Ile-Ife. Samples were collected from 5 abattoirs in Ile-Ife and 5 refuse sites. The collection of samples covered a period of 4 months from March to June 2009. The samples were processed using concentration methods (Simple sedimentation and saturated salt floatation techniques). 64 ova and cyst of intestinal parasite were recovered from abattoir waste and 31 from refuse dumps. Trohozoites of protozoa and larvae of some helminths recovered are 95. In refuse dump samples; *Entamoeba histolytica* 18 (28.1%) *Entamoeba coli* 12 (18.8%), *Balantidium coli* 2 (3.1%), *Taenia* spp. 2 (3.1%), *Hymenolepis nana* 3 (4.2%), Hookworm 2 (3.1%) are recovered while in abattoir wastes *Ascaris lumbricoides* 17 (54.8%), Hookworm 9 (29.0%), *Balantidium coli* 5 (16.1%) and trophozoite of *Balantidium coli* 15 (15.8%), *Trichomonas hominis* 56 (58.9%), larvae of *Strongyloides stercoralis* 13 (13.7%) and Hookworm 11 (11.6%) were recovered from abattoir effluents. The public is encouraged to take good sanitary and hygienic habits; wastes from our houses should be properly disposed either by burning or burying deep in the soil. Protective material like shoe and hand gloves is suggested for workers that will be having contact with night soil and any waste water, effluents and slurries that will be used as manure or to irrigate farm products should be treated before use and any infected individual should be well treated and prevented from infecting others.

Keywords: Parasites; Protozoa; Soil; Dumps

INTRODUCTION

Refuse, soil, animal wastes and sewage sludge are common sources of manure used to fertilize agriculture fields [1,2]. The use of community refuse, human excreta and abattoir effluents to fertilize agricultural fields is gaining more prominence. This practice is particularly so in the developing countries due to the growing costs of chemical fertilizers which have become unaffordable to many farmers and also because of the increasing demand for basic food supplies, some villagers are also of the habit of using pond or stream water into which waste effluent have been discharged to wet the floor of their hut. Recycling of waste water for agricultural irrigation can provide a strong economic impetus because it helps to conserve resources and protect the environment by preventing river pollution, protecting water quality and prevention of sea water intrusion in coastal area [3-5]. The presence, prevalence and distribution of intestinal parasites in refuse, human and animal wastes have reasonably been reported in different parts of the world. The most important of these parasites are *Entamoeba Histolytica*, *Ascaris lumbricoides*, Hookworm, *Balantidium coli, Trichomonas hominis, Taenia saginata* [6]. Recent epidemiological studies have indicated that in areas of the world where helminthic disease are endemic in the population and where raw untreated waste water is used to irrigate vegetables and other salad crops generally eaten uncooked, the consumption of such waste water irrigated vegetables may lead to parasitic infection. These studies also

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Received: April 03, 2019, **Accepted:** April 29, 2019, **Published:** May 06, 2019

Citation: Udoh SJ, Olaniran O, Adedire BA, Hassan-Olajokun RE, Olaniran OO, Oyetokeo O, et al. (2019) Investigation on the Pattern of Intestinal Parasites Present in Refuse Dumps and Abattoir Wastes in Ile-Ife. Nigeria. Biol Med (Aligarh) 11:460.

indicated that regardless of the level of municipal sanitary and personal hygiene, irrigation of vegetables and salad crops with raw waste water can serve as a major pathway for sustained exposure to helminthic infection [7-9].

A number of intestinal parasites which are life threatening in many communities and are of major international health concern which are also capable of being transmitted through abattoir waste and refuse dumps have been reported [1,10]. It has been shown that refuse dumps are significant source of transmission for intestinal parasitic infection in Kampala, Uganda and Jos, Nigeria [4]. Gastro intestinal nematode eggs have also been regularly demonstrated in dung heaps on farms in some other places, but there is a dearth of information on the status of refuse dumps and abattoir wastes in south western Nigeria especially in Ile-Ife, Osun State. The main objective of this study is to examine refuse dumps and abattoir waste and determine pattern of parasites associated which may be transmitted to man.

MATERIALS AND METHODS

Study area

The study was conducted in 10 locations selected in Ile-Ife being an ancient city has been experiencing influx of people lately due to reasons ranging from economical to social and also due to recent development in the city like the Obafemi Awolowo University pre-degree School. These developments have caused an increase in the number of abattoirs being operated in the city hence, increase in refuse dump sites being sighted in public places.

Sample selection

5 abattoirs were selected for the collection of samples likewise 5 refuse dump sites.

Abattoirs sites: (a) Orisunmibare slaughter slab, (b) Oluorogbo abattoir, (c) Maribatise abattoir, (d) Omi okun slaughter slab, (e) Ilode slaughter slab.

Refuse dump sites: (a) Moremi line 1, (b) Oranfe street, (c) Iloro area, (d) Iyekere (Beside Ife Anglican Grammar School Arubidi Ile-Ife), (e) Okesoda Street.

The refuse locations are selected on the basis of their high load of wastes.

Sample collection

About 200 g of refuse sample was collected from each of the various selected sites into clean screw capped plastic containers likewise from the abattoirs. These samples were taken at different points of reach refuse sites and abattoir wastes in order to ensure adequate coverage and equal representation.

Sample analysis

Demonstration of intestinal parasites in refuse dumps: About 100 g of refuse was weighted and passed through a coarse sieve to remove stone and grass with other undesirables, the sample was then transferred to a 50 mL volumetric flask. To each volume of refuse, 2 volume of 30% sodium hypochlorite fluid was added as disinfectant, vigorously stirred and allowed to stand for 30 minutes.

The mixture was further diluted and mixed; coarse particle was strained out and spun at 3000 rpm for 2 minutes. The supernatant of the mixture was discarded and a drop of the sediment placed on a glass slide, covered with cover glass and examined in light microscopy at magnification of 10X and 40X [11].

Demonstration of intestinal parasites in abattoir wastes: 100 g of abattoir wastes including cow dung was weighted and prepared into slurry after passing though coarse sieve to remove stones and other undesirables.

The slurry is sieved again and the liquid fraction is then collected discarding the residue. The filtrate is centrifuged at 3000 rpm for 2 minutes after which the supernatant was discarded and the deposit retained. The residue contains most of the eggs as well as light and heavy particulate matter. The residue is suspended in 100 mL of formal saline solution and spinned at 3000 rpm for 2 minutes and the supernatant decanted leaving the deposit behind. The deposit is then examined microscopically by placing a drop on a glass slide and covered with a cover glass. The deposit is examined using 10X and 40X objective of the microscope for the presence of cyst and eggs of parasites [2].

Demonstration of intestinal parasites in abattoir effluents (waste water): The waste water collected from the abattoir is examined directly after spinning at 3000 rpm for 5 minutes to determine the presence of eggs or cyst of parasite likewise trophozoite of flagellates and ciliates and the larvae form of some parasites [2].

RESULTS

Parasites encountered in refuse dumps in Ile-Ife

Protozoan cysts and helminth eggs of human and animal origin were recovered from municipal dumps as shown in Table 1. Of all the different species of parasites recovered: protozoan cyst were 32 (50%), comprising *Entamoeba histolytica* 18 (28.1%), *Entamoeba coli* 12 (18.8%), *Balantidium coli* 2 (3.1%) and 32 ova of helminth: *Taenia* spp. 2 (3.1%), *Hymenolelpis nana* 2 (3.1%), Hookworm 2 (3.1%), *Ascaris lumbricoides* 25 (39.1%).

Parasites encountered in abattoir waste with cow dung

Samples of abattoir waste contained parasites of which some differed from those obtained in refuse. *Ascaris lumbricoides* 17 (54.9%), Hookworm 9 (29.0%), *Balantidium coli* 5 (16.1%) (Figure 1).

Parasites encountered in abattoirs effluents

Totals number of 95 parasites such as trophozoites of flagellates and larvae of nematodes were recovered with trophozoites of *Balantidium coli* 15 (15.8%), *Trichomonas hominis* 56 (58.9%),

larvae of *Strongyloides stercoralis* 13 (13.7%) and larvae of Hookworm 11 (11.6%) Table 2.

Table 1: Number and percentage of parasitic ova and cyst found in refuse dumps.

Parasites	No of cyst/eggs per 100g	Percentage %
Entamoeba histolytica	18	28.1
Entamoeba coli	12	18.8
Balantidium coli	2	3.1
Taenia species	2	3.1
Hymenolepis	3	4.7
Hookworm	2	3.1
Ascaris lumbricoides	25	39.1
Total	64	100.00%

Table 2: Trophozoites of flagellates and larvae of helminths.

Parasites	No of Trophozoites/ Larvae per 100 g	Percentage %
Balantidium coli	15	15.8
Trichomonas hominis	56	58.9
Strongyloides stercoralis	13	13.7
Hookworm	11	11.6
Total	95	100.00

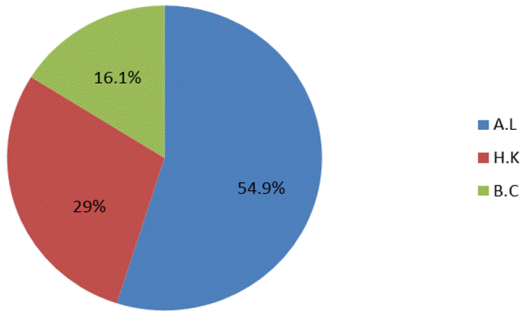

Figure 1: Pie charts showing percentage of intestinal parasite ova and cysts found in abattoir wastes.

A.L= *Ascaris lumbricoides*

H.K= Hookworm

B.C= *Balantidium coli*

DISCUSSION

This study has shown that the prevalence of both human and animal parasites in wastes in Ile-Ife. The commonly found intestinal parasites from the 5 abattoirs and 5 refuse dump sites visited were *Ascaris lumbricoides*, *Entamoeba histolytica* and Hookworm while the least encountered was *Balantidium coli*.

The cysts and trophozoites of protozoa with the eggs and larvae of helminths recovered from the refuse dump and abattoir sample were essentially those that were shed in the faeces of human and animals which become dispersed indiscriminately to other places.

These sources of cyst and eggs in refuse dumps and abattoir are similar to those previously reported in Jos, Nigeria on some health hazards associated with solid management and intestinal parasites from refuse and abattoir waste in Jos, Nigeria and also in pathogenic intestinal parasites and bacteria agents in solid wastes [2,9,11].

The intestinal parasites gotten from the refuse site visited includes *Ascaris lumbricoides* 25 (39.1%), which is higher than that gotten in Ibadan which is (19.3%) and in Jos Plateau State differs 73%.

The parasites with the least prevalence recovered from refuse dumps are *Balantidium coli* and *Taenia* species (3.1%) while the parasite with the least prevalence in Jos is *Balantidium coli* 43%.

From abattoir waste, *Ascaris lumbricoides* has the highest prevalence 17 (54.9%) the specie of *Ascaris* gotten in Jos (Plateau State) differs from that gotten in Ile-Ife, *Ascaris suum* a parasite of pig and cattle was gotten to be 160,000 kg/dry weight while the work done in Ibadan did not report it in abattoir sites. Hookworm 9 (29.0%) has the next prevalence to *Ascaris* and *Balantidium* is the third with the least prevalence 5 (19.1%).

The average number recovered in Plateau State indicates a high prevalence of intestinal parasites and even so many rare species like *Oesophagostomum* spp. and *Ascarop strongylina* [2].

This high prevalence in Jos is probably due to their poor hygiene level and the high population of people in the area. The fact that Jos is in the northern part of Nigeria and most indigenes are herdsmen also contributed to many species gotten there. The work done in Ibadan covers only refuse dumpsite and the result is low compared to that of Ile-Ife probably due to their level of development and enlightenment education which are responsible for the low parasite gotten in Ile-Ife compared with that of Jos, Plateau State [11].

CONCLUSION

The findings in this study has shown a prevalence of intestinal parasitic eggs, cysts, trophozoites and larvae in the samples analyzed, therefore, farmers are encourage to wear protective boots or gloves and do not use bare hands but farm implements in making irrigation canals. The public is encouraged to take proper washing of vegetables before consumption. Also, good sanitary and hygienic habits should be practice by every individuals especially constant washing of hands. Wastes from our houses should be properly disposed either by burning or

burying deep in the soil. Protective material like shoes and hand gloves are suggested for workers that will be having contact with night soil.

Any waste water, effluents and slurries that will be used as manure or to irrigate farm products should be treated before use and any infected individual should be well treated and prevented from infecting others.

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