



Prevalence of Helminthes in Dogs and the Owners awareness of Zoonotic Disesesas in Michiru, Blantyre, Malawi

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Introduction:

Dogs live in close association with humans, providing them with companionship and security.

Malawians are good at keeping dogs for security purposes. Few keep them as a hobby. So they wouldn't waste their hard earned money to bring them to the veterinary clinics.

And dogs can host well-known zoonotic parasites that cause diseases. What are zoonotic diseases? These are infections that spread between animals and people. Most cases animals carry harmful germs that can be shared with people and cause illnesses. These harmful germs are viruses, bacteria, parasites and fungi. And who is at a higher risk, these are children younger than 5 years and adults older than 65 years and people who have weakened immune systems.

Background:

Even though this survey was conducted door to door, it is difficult to estimate the total number of dogs in the nation given that there are more than **35,000** dogs in Blantyre alone. According to a survey, each family in Malawi may have three to four dogs on average. According to the study, 40 percent of the dogs have received vaccinations against various zoonotic diseases that are at danger. According to estimates, rabies kills 400 individuals in Malawi each year, costing the economy of the nation 13 million dollars. As a viral zoonotic illness, rabies is proof that Malawians, who own dogs in significant numbers, are not giving dog health the attention it deserves. (Bunner et al, 2016).

Humans and dogs can both contract zoonoses. Helminthes infections are one of the recognized zoonotic illnesses. If canines are not dewormed, there is a far greater likelihood that humans will contract the disease from the dogs either directly or through contaminated food. Many dogs in Malawi, which is primarily a dog-keeping society, are rarely dewormed, despite the fact that certain members of the public are able to do so. According to this study, there may be many dogs that have not been dewormed, which poses a serious risk of helminthic diseases to people who own dogs.

Objectives

1. To diagnose the presence of zoonotic parasitic helminthes among domestic dogs in Michiru, Blantyre, Malawi classified as:
 - a. Flukes
 - b. Cestodes
 - c. nematodes
2. To determine zoonotic parasitic helminthes species prevalence among dogs in Michiru, Blantyre, Malawi classified as:
 - a. Flukes
 - b. Cestodes
 - c. nematodes
3. To assess owner's awareness of the parasitic helminthes among dogs in Michiru, Blantyre, Malawi

Methods:

The researcher worked with the Blantyre SPCA (Society for the prevention of Cruelty to Animals). So the dogs (70 dogs) were put to sleep or under anesthesia and the researcher had to use gloves and insert into the anus to collect the feces. Then the specimen was analyzed in the laboratory at BSPCA, the process was to look for the following parasites in the stool.

Findings:

The researcher found that the very common parasites found were the Anclostoma duodinate, Toxocara carris, Echinococcus granulosus and the Diphyllobothrium latum. The results showed that the common parasitic helminthes was the Toxocara carris and the least found was the Diphyllobothrium latum with only 8.6% of the total population. The data was analyzed descriptively.

Implications:

The findings suggest that the findings of this study point out that there could have been transmission of the parasite from the humans to dogs or vice versa in Michiru, Blantyre. There can also be more common in other parts of the country than expected. So there should be a deworming campaign not only of the host but the owner as well.

Report indicates that there are (Gibson, 2016) 74, 800 dogs in the entire city of Blantyre. The same reports revealed that only a quarter of these dogs are vaccinated against various zoonotic diseases. There is no report indicating how many dogs are annually dewormed against helminthes parasites because this remains at owner's choice. An estimated 60,000 people die of rabies annually. The vast majority of cases of human rabies develop following a bite from an infected dog (Alvåsen & Höglund, 2016).

This is a clear indication that there may be a high prevalence of helminthes infection among dogs in Muchiru, Blantyre, with the fact that there are over 74,800 dogs. The present study aims at ascertaining the prevalence and presence of helminthes parasites among dogs and owner's awareness in Michiru, Blantyre, Malawi.

Significance of the Study

This study will be of a very significant importance to the following:

Ministry of health:

The ministry of health deals with case of diseases. Though dealing with many diseases, among them are parasitic helminthes. The best way to prevent parasitic infections is by knowing the life cycle and the intermediate hosts, which can include dogs. This study may reveal a very important information on the presence of the parasitic infections. If dogs are infected, then a necessary step can be implemented to prevent transmission of the parasites to the owners and also among the dogs. This will reduce the prevalence and the rate of infection.

Ministry of livestock: This ministry is concern with the health and welfare of the domestic animals. This ministry is in a position to deal with all possible infections upon receiving the findings of this study. This means the findings will guide the veterinary officers working under this ministry to focus their attention towards treating the infections. Infected dogs can also transmit infections to the livestock which in turn may results to diminish production and loss of animals. Hence farmers will be able to understand where the loss of animals could and diminishing productivity comes from.

Dog owners: Dog owners are at risk of getting infected if their dogs are also infected with parasites. The researcher will provide information on the awareness to the owners on the possible infections that their dogs can pose. Therefore, they can be able to protect themselves from these infections.

Justification of the Study

Gibson (2016) declared that Rabies as a zoonotic disease is particularly problematic in Malawi, costing the country an estimated 13 million USD and 484 human deaths annually, with an increasing pediatric incidence in Blantyre City.

Scope of the Study

This study was conducted in the republic of Malawi, in Michiru location in the county of Blantyre. The target population were dog and dog owners with Michiru location. There are 150 registered dogs in this specific area of study according to the present records. The study was conducted where participants were those who own dogs. Though owners only participate in their awareness of the zoonotic parasitic helminthes affecting their dogs. The study was conducted between September and November 2019. All the dogs in this particular area participated in this study.

Research Design

This study adopted descriptive cross-sectional study design. A descriptive study design is one in which its primary goal is to assess a sample at one specific point in time without making any conclusion on the causal statements. A descriptive cross-sectional study is a study in which the disease or condition and potentially related factors are measured at a specific point in time for a defined population. In this case, the population is the number of

dogs in Michiru. There was no any manipulation of the participants which are the dogs nor the dog owners, therefore the study is not experimental. Cross-sectional studies are pictures of the frequency and characteristics of a condition in a population at a particular point in time. This implies that the parasitic helminthes in prevalence at a specific point in time in Michiru in Blantyre was described. The type of data that was obtained was about the presence of the parasitic helminthes at that specific point in time. But it is noted that the exposure and the parasitic helminthes are measured at the same point in time there was no any causal statement that was made at any point in time of the study. In this study it was not be possible to distinguish whether the exposure proceeded or followed the infection by the parasitic protozoans among dogs in Michiru on Blantyre. (NERDAC, 2018).

Population and Sampling Techniques

The records from the Malawi Ministry of Livestock shows that there are 150 dogs in five villages of Michiru location (Ministry of Agriculture, Irrigation and water, 2019). The researcher used purposive critical case sampling technique where available dogs in Michiru participated in the study. Critical case sampling is a type of purposive sampling in which just one case is chosen for study in this case Michiru location because the researcher expects that studying it revealed insights that can be applied to other like cases within the republic of Malawi or the entire Blantyre province. Therefore, under this sampling method, the sample size was at least be at 150 dogs unless otherwise (Schutt, 2006).

On the onset of the days the researcher went to collect the samples, there was a promising turn up. At the end of the days assigned for Michiru the total sample collected was 70 dogs in total.

Diagnostic Procedure

The present study used only dogs' fecal samples as the only samples that was used to observe the presence of the parasitic helminthes eggs.

The most common and efficient way to obtain fecal egg counts for sheep, goats, young cattle and horses and dogs is to use the Modified McMaster Test. This is a flotation test that separates parasite eggs from debris based on density; the eggs float

to the surface of the counting chamber. This test uses a special microscope slide with

a grid, which makes counting accurate and proper estimation. Sedimentation techniques use solutions of lower specific gravity than the parasitic organisms, thus concentrating the latter in the sediment. Sedimentation techniques are recommended for general diagnostic laboratories because they are accurate, accessible to perform

Data-Gathering Procedures

The researcher travelled with the BSPCA team of doctors and volunteers to Michiru, Blantyre, where they were administering the anti-rabies vaccines, castrating the dogs and giving any other veterinary assistance to the dogs in the villages. A mobile clinic was set up and the researcher personally got gloves a packed sterile specimen tubes and once the dogs were sedated, the index and middle fingers were used to get fresh dog feces from the anus of the said dog, the clinic was set up as early as 7 am. Once the feces were collected, some was sealed in the glove and stored in a cooler box. Whenever the feces were a lot some were sealed in a specimen tube. The tube and the gloves were completely sealed and transported to the veterinary research laboratory (BSPCA) in Blantyre Malawi at the end of the day. A total of 70 specimens was collected and once they reached the research laboratory, the samples were kept in a fridge. The original number to be collected was 150 samples but some owners were there just for anti-rabies vaccines only and not castrations, so it was deemed impossible for the researcher to collect the feces. A dogs will be collected before the start of the analysis.

Objective 1: To diagnose the presence of zoonotic parasitic helminthes among domestic dogs in Michiru, Blantyre, Malawi classified as:

- a) Flukes
- b) Cestodes
- c) Nematodes

Table 1

Diagnosed Parasitic Helminthes

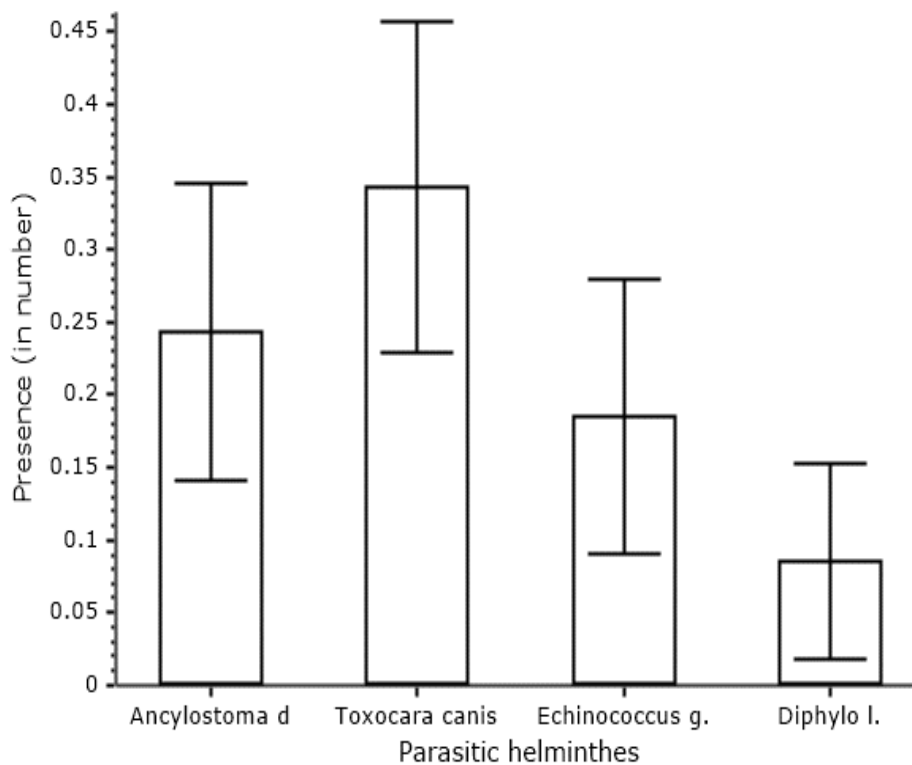
Parasite	n	Positive dogs	Negative dogs	Class
<i>Ancylostoma duodenale</i>	70	17(24.3%)	53(75.7%)	nematodes
<i>Toxocara canis</i>	70	24(34.3%)	46(65.7%)	Nematoda

<i>Echinococcus granulosus</i>	70	13(18.6%)	57(81.4%)	Cestoda
<i>Diphyllobothrium latum</i>	70	6(8.6%)	64(91.4%)	

Table 1 shows the parasites, the number of positive dogs, and the class at which the parasite belongs to. This data answers research question which one which attempted to find out the presence of the parasitic helminthes among the sampled dogs in Michiru location in the republic of Malawi. The data was analyzed descriptively. The diagnosis procedure included sedimentation and floatation methods. The main aim of each diagnostic procedure was to identify the cyst and eggs of various parasitic helminthes. Samples of feces acquired from the sampled 70 dogs were analyzed using light microscope at various levels of magnification to achieve the best view.

The findings shows that *Toxocara canis* was the most common parasitic helminth where 33.4% of the dogs tested positive for this parasite. This was followed by *Ancylostoma duodenale* where 24.3% of the 70 dogs tested positive for the parasite. The least common parasite was *Diphyllobothrium latum*, only 8.6% of the dogs tested positive for this parasite.

The life cycles of *Toxocara* species can be direct (one host) or indirect (many hosts). Unembryonated eggs are excreted in the feces of the main host (*T. canis* in canids and *T. cati* in felids). Eggs become infectious and contain third-stage larvae after embryonating in the environment for 1 to 4 weeks. The infectious eggs hatch after being ingested by a specific host, and the larvae then break through the gut wall. The larvae move through the lungs, bronchial tree, and esophagus in young dogs (*T. canis*) and cats (*T. cati*), where they are coughed up and ingested into the gastrointestinal tract; adult worms grow and oviposit in the small intestine (CDC - DPDx - Toxocariasis, n.d.).



SUMMARY CONCLUSION AND RECOMMENDATIONS

Summary of the study

The study was conducted in Michiru location in the republic of Malawi. The research focused on prevalence of helminthes in dogs and the owners awareness of zoonotic diseases in Michiru, Blantyre Malawi. The objectives of the study were: The identify the parasitic helminthes in sampled dog feces, the prevalence of the parasitic helminthes among sampled dogs, and dog owners' awareness of the parasitic helminthes and associated diseases. The study used descriptive study design where 70 samples of feces was examined using floatation and sedimentation techniques. The data was analysed using

descriptive statistics. The findings of the study revealed that *Toxocara spp*, *Ancylostoma spp*, *Echinococcus spp* and *Diphybothrium spp* were identified. In terms of the prevalence, *Toxocara spp* (34.3%) ,*Ancylostoma spp* 24.3%, *Echinococcus spp* (18.6%) and *Diphybothrium spp*(8.6%). Dog owner were not aware of the parasitic helminths. The study reported that 48% of the dog owners do not deworm their dogs, 87% despose dog waste by throwing away and 82.5% of the dog owners attribute cost and access to drugs on their failure to deworm their dogs.

Summary of the findings

Toxocara spp, *Ancylostoma spp*, *Echinococcus spp* and *Diphybothrium spp* were identified parasites in 70 samples obtained from 70 sampled dogs

The prevalence of parasitic hijhuyhelminthes were as follows: *Toxocara spp*, (343/1000 CI: 95%) *Ancylostoma spp* (243/1000, CI:95%), *Echinococcus spp*(186/1000 CI:95%) and *Diphybothrium spp* (86/1000 CI:95%) .

According to the study, 48 percent of dog owners do not deworm their pets, 87 percent discard dog feces, and 82.5% of dog owners blame the high cost of deworming medications and lack of access to them for not doing so.

Conclusion

Toxocara spp, *Ancylostoma spp*, *Echinococcus spp* and *Diphybothrium spp* infect dogs in Michiru Malawi, hence dogs are infected with parasitic helminthes.

Toxocara spp is the most prevalent helminths among dogs in Michiru , Malawi.

The awareness and knowledge of parasitic helminthes among dog owners is poor in Michiru.

Recommendation

Mass deworming of all dogs in the entire country of Malawi

Proper disposal of dog waste. Intensive campaigns to be conducted by veterinary department of Malawi

Seminars to be conducted across the country of Malawi, focusing on transmission of parasitic Helminthes and diseases.

Recommendation for further study

The study recommends that a study be conducted about access and effectiveness of veterinary services and agricultural extension centres.

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