

Assessing the Rate of Parasitic Infections in Household Pets and Livestock: An Empirical Study

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Abstract

Parasitic infections in domesticated animals provide a substantial health risk to the animals and human beings. Common parasites include fleas, ticks and intestinal parasites, which can easily spread between dogs. Regular veterinary check-ups, prophylactic medications and meticulous hygiene protocols are essential for controlling and avoiding these diseases. Pet owners can obtain information about the risks associated with parasite illnesses to protect the well-being of their family and the environment. In this research, we examine the occurrence and dispersion of gastrointestinal parasites in household pets, to provide significant information on public health and animal health management. We collected 60 feces samples from a variety of animals (including dogs, goats, hens and cats) in Delhi, India. The gathered specimens were subjected to the ether concentrations method before that is examined under a microscope for the presence of parasite eggs or larvae. Additionally, demographic details, such as breed and gender details, were collected. The responses were evaluated using SPSS 22.0 application, employing descriptive and chi-square techniques. There were a total of six gastrointestinal parasites observed, with a total prevalence rate of 48.33%. The species identified were "Ascarisspp (A-spp), Strongyloidesspp (S-spp), Prosthogonimusspp (P-spp), Hymenolepsisspp (H-spp), Trichostrongylusspp (T-spp), Tapeworms (Tws)". The obtained findings will assist in the development and deployment of suitable initiatives for health education for avoiding animal infections and decreasing the possibility of spreading to humans.

Keywords: Parasitic infections, Household Pets, Livestock, Animal health, Gastrointestinal parasites.

INTRODUCTION

Parasitic infections are widespread and complex behaviors in nature (1), impacting a wide range of creatures, including individuals as well as animals (2). These illnesses are caused by worms, which are creatures that depend on their environment for their nourishment and survival. The parasites can be categorized into many groups, including protozoa, helminths and ectoparasites, each possessing distinctive characteristics and methods of reproduction (3). Parasitic diseases are a worldwide issue that affects ecosystems, farming and the general population. Protozoa, which are unicellular microorganisms, are prevalent parasites that can affect both people and animals. Malaria, resulting from parasite "Plasmodium and Giardiasis, resulting from Giardia lamblia, are instances of protozoan's illnesses" that impact humans (4). Helminths are complex parasites consisting of many cells, such as tapeworms, roundworms and flukes (5). These parasites populate the intestines of organizes, resulting in starvation and other problems with health. Ectoparasites, including mosquitoes and ticks, inhabit the outside surfaces of organizes, leading to irritation and spreading several illnesses.

Parasitic illnesses can spread through several means, such as consuming infected water or food, coming into proximity with infected people or creatures (6) and it is transferred by insects like flies and parasites. Parasitic diseases have wide-ranging consequences that contribute serious health issues, including economic production, farming and habitat preservation endeavors (7). Regarding the domain of domesticated animals, parasite illnesses provide a substantial risk to the physical condition and wellbeing of the creatures and can even have consequences for human health. Canine, feline, avian and other domesticated creatures are vulnerable to a variety of parasite organisms that can lead to illnesses impacting different organ systems (8). Prevalent parasites



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observed in domesticated animals including gastrointestinal helminths, such as nematodes and ancylostomes, as well as ectoparasites like insects and fleas. Pets can suffer from gastrointestinal problems, including diarrhea, vomiting and weight loss, as a result of intestinal parasites.

Several parasites include zoonotic capacity, indicating their ability to be adopted from animals to people (9). It underscores the significance of maintaining good hygiene practices and obtaining routine veterinarian treatment to reduce the transmission of parasite illnesses from pets to their guardians. Flea infestations can result in dermatitis, anemia and the transfer of tapeworms, whereas ticks can transmit severe infections including Lyme illness and ehrlichiosis (10). Consistent cleaning, proactive measures and immediate veterinarian intervention are essential for controlling and avoiding parasite infections in domesticated animals. Gaining a comprehensive understanding of the characteristics of the illnesses and applying preventative measures is crucial to minimize their effects on homes, communities and environments. Responsible animal farming, frequent veterinarian check-ups and effective parasite control procedures are essential in maintaining the well-being of both domestic pets and their human collaborators.

The investigation (11) examined and assessed the various stages of parasites that inhabit eatable insects in family-owned ranches and pet shops in Central Europe. The testing material consisted of actual adult insects obtained from 300 farmer families and pet retailers. Parasites was discovered in 244 (81.33%) out of the 300 (100%) insect houses were evaluated. The investigation highlighted the significant contribution of those insects to the spread of parasites that were harmful to animals. The study (12) evaluated the probability of parasitic infections in household cats that engaged in natural environments, incorporating note of the transfer of parasites between proprietors, additional pets and animals. Through the utilization of meta-analysis involving 19 different infections, such as "Toxoplasma gondii and Toxocaracati", the study demonstrated that cats with the ability to venture outdoors were 2.77 times more susceptible to infection compared to cats who reside inside. Furthermore, a notable correlation was found between greater absolute latitudes and an increased probability of infection.

Researchers of (13) performed a study in the "Coastal Savannah zone of Ghana" to ascertain the frequency and severity of risks correlated with gastrointestinal parasitical infections in grazing animals. Eimeria had the highest prevalence rate, accounting for 78.4% of cases and simultaneous infections were identified. The logistic regression analyses demonstrated that certain parasite infections were correlated with parameters including the kind of flooring, the breed of ruminant and the overall size of the herd. The research underscored the significance of cleanliness, management practices and nutrition in enhancing livestock well-being and efficiency in Ghana. The study (14) investigated advancements in veterinarian vaccine development for domesticated animals as a means of managing gastrointestinal parasite infections. Acknowledge the worldwide importance of "food-borne diseases (FBDs)" contributing to significant rates of death and illness, including those attributed to parasites including "Taeniasolium, Echinococcusgranulosus, Toxoplasma gondii, Cryptosporidium spp and Trichinella spiralis". The findings addressed the shared risk that those substances present for both the health of animals and worldwide food manufacturing.

Researchers of (15) conducted an examination of domesticated animals for gastrointestinal parasite infections in Moscow. The findings indicated that the occurrence of intestinal protozoa diseases was higher compared to parasite infections, especially among exotic species. The parasitic infections found in dogs and cats had the greatest range of variety, with "toxocarosis and Giardia sp." the most commonly identified. The research demonstrated parasites that were prevalent in both animals and people, suggested that humans could get infected under specific circumstances. The study (16) examined the possibility of animals in nature to serve as transmitters for "gastrointestinal nematodes (GIN)" that impact domesticated cattle. An analysis was conducted on fecal samples collected from different livestock hosts in sixteen states in the United States. Ostertagia was the most common genus, represented 90% of the total, followed by Trichostrongylus at 69%. The results showed that 33% of the samples tested positive for nematode DNA and 46% of the samples included DNA from GIN subspecies regarded in cattle.

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The study (17) investigated the interrelated routes among the growth of worldwide infectious diseases and the projected increase in demands for food by the year 2100. The methodology entailed synthesizing research to understand the impacts of development in agriculture and improvement on infectious illnesses, as well as the reciprocal consequence. The analysis included considering several elements, including usage of antibiotics, water resources, pesticide application as well as the frequency of relationships among people and animals. The findings indicated that agricultural factors had responsible for more than 25% of all infectious illnesses. Authors of (18) performed a comprehensive investigation on the prevalence and characteristics of "cystic echinococcosis (CE)" in nations located in the "European Mediterranean and Balkan" regions. The records were used to encompass individuals as well as animal illnesses. The results were classified using the "Nomenclature of Territorial Units for Statistics (NUTS)" classification, then aggregated at the NUTS1 level. The analysis identified variations in data and a shortage of studies on the prevalence of the condition in people. That highlighted the issue of understating in animals as well as human cases.

The research (19) evaluated the potential for infections by parasites in ovine flocks resulting from the comanagement of goats in northern Spain. The study involved collecting 2,093 sheep from 74 industrialized meat ovine groups and that demonstrated the connection with goats increased the chance of sheep illness. The presence of combined management served as a source of degradation for parasites that affect different species, while the struggle among sheep and goats for nutrients resulted to ecological pollution and anxiousness, which could potentially facilitate the spread of infections. Researchers of (20) evaluated the frequency of gastrointestinal parasites in big ruminants that died in Alexandria, Egypt. A total of 364 animals were subjected to fecal samples and after death investigation. Parasites were detected in 35.71% of the subjects by fecal testing and in 20.87% during postmortem testing. The prevalence of sarcocystosis was determined to be 3.57%. The presence of such pathogens increased their chance of causing disease, highlighted the importance of implementing preventive procedures in automated abattoirs. This study aims to examine the occurrence and dispersion of gastrointestinal parasites in household pets in Delhi, India to provide significant information on public health and animal health management.

METHODOLOGY

Data gathering

We obtained primary data from 60 fecal samples obtained in Delhi, India, representing a variety of animals including dogs, goats, hens and cats. This technique, provides a comprehensive understanding of parasitic illnesses that are common in domesticated animals, taking into consideration the distinct environmental and demographic factors of Delhi. All animals studied were of local breed origin, representing the whole sample group. The animal composition with dogs accounted for 25% of the total, goats contributed for 30%, hens represented for 20% and cats counted for 25% as mentioned in Table (1). The utilization of meticulous sampling techniques ensured the collection of a dataset that represents the population, so establishing the basis for a thorough examination of parasite diseases in these domestic animals.

Animals	Total Count	Percentage (%)	Local Breed	Male Count	Male Percentage (%)	Female Count	Female Percentage (%)
Goats	18	30	18	9	50.0	9	50.0
Dogs	15	25	15	7	46.7	8	53.3
Hens	12	20	12	-	-	-	-
Cats	15	25	15	6	40.0	9	60.0
Total	60	100	60	22	36.7	26	43.3

 Table (1). Outcomes of Accuracy (Source: Author)



Research process

The present investigation employed a design with a cross-sectional approach. Community engagement sessions were conducted, leading to the identification of a facility where dogs are slaughtered. Households with a minimum of one type of domesticated animals were contacted and if they agreed, they were enrolled in the research. The families were assigned numbers and approached in the early morning to gather fecal samples. Currently evacuated fecal samples were gathered into sterile containers that were clearly tagged. The specimens were conserved in the presence of "sodium-acetate-acetic-acid formalin (SA3F)".

During a two-month period, we made several visits to a factory engaged in the practice of dog slaughtering to gather data. The dogs obtained for slaughter mostly came from homes in the surrounding neighborhood, but also from houses in nearby villages. Throughout our examinations, dogs were independently recognized using tags and fecal samples were methodically obtained from their rectums. These samples were preserved in clean bottles and then mixed with a 10ml SA3F solution to preserve them. In addition, develop worms obtained from identified slain dogs were gathered and maintained in a formaldehyde solution for subsequent analysis and evaluation. The samples of feces were processed using the ether concentrations technique. Following the homogenization process in a 10ml SA3F solution, the resultant mixture passed filtration to remove any unwanted particles. After that are subjected to centrifugation at a rate of 2000 revolutions each minute for duration of 5 minutes, the top particles were separated, resulting in a sediment volume of 1ml. Upon microscopic examination using 10x scopes, the sediment indicated the presence of eggs from parasites or larva. The demanding procedure entailed the addition of saline and ethyl providing an accurate measurement and analysis of assumed parasite components.

RESULTS

The statistics collected from the research were inputted into "Microsoft Excel 2019 and analyzed using SPSS Statistics V22.0 application". The study employed statistical techniques, including proportions and frequencies, to determine the overall incidence of gastrointestinal parasitic infections. Chi-square analyses were utilized to examine the relationships among the presence of disease and demographic characteristics, such as the kind of animals, breed of creature and genders.

The examination of gastrointestinal parasites indicated a total occurrence rate of 48.33%, as described in the Table (2). S-spp had the greatest rate of prevalence among the observed parasites, with a percentage of 13.33%. A-spp followed close behind with an average prevalence of 8.33%. Two and H-spp showed significant prevalence, representing 11.67% and 6.67% of the total, respectively. The prevalence of P-spp as well as T-spp was 3.33% and 5%, respectively. The extensive results highlighted the relevance of dealing with these particular parasitic illnesses in the community under study, underlining the requirement for customized therapies to manage and prevent parasites.

Parasites	Amount of Positives	Percentage (%)
T-spp	3	5
A-spp	5	8.33
H-spp	4	6.67
S-spp	8	13.33
P-spp	2	3.33
Tws	7	11.67
Total prevalence	29	48.33

 Table (2). Total prevalence of parasites (Source: Author)

The evaluation determined the occurrence of gastrointestinal parasites in different domesticated animals, presenting noticeable variations. 13 instances of A-spp and Tws were found to be frequent among goats. Dogs exhibited instances of A-spp and S-spp, while hens demonstrated various illnesses, such as H-spp and T-spp,



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resulting in a total of 11 cases. There was one instance of A-spp in cats as mentioned in Table (3). The range of p-values, which indicate significant differences, was between 0.24 and 0.63 as mentioned in Figure (1). These data highlighted the diverse vulnerability of domesticated animals to certain gastrointestinal parasites, underlining the necessity for focused preventative measures and veterinary therapies.

Table (3). Parasites in different domesticated	d animals (Source: Autho	or)
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Pet Animals		Amount of positives									
	A-spp	Tws	S-spp	P-spp	H-spp	T-spp	Total				
Goats	3	3	4	-	1	2	13				
Dogs	1	-	2	-	1	-	4				
Hens	-	4	2	2	2	1	11				
Cats	1	-	-	-	-	-	1				



(Source: Author) Figure (1). Parasites in different domesticated animals

To ascertain the prevalence of gastrointestinal parasites by breed and gender, a study has been carried out. The investigation provided various incidences of gastrointestinal parasites across different breeds and genders. The most prevalent parasites in the Local Area breed were A-spp and Tws, with a total of 29 reported cases. Male animals had a greater prevalence of S-spp and T-spp, whereas females had a higher incidence of P-spp and Hspp instances as mentioned in Table (4). The p-values ranged from 0.12 to 0.91, showing different levels of significance in statistics are mentioned in Figure (2). These data demonstrate the variations in vulnerability to gastrointestinal parasites according to breed and genders, underscoring the significance of customized preventative measures in varied population.



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Table (4). Parasites according to breed and genders (Source: Auth	or)
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Amount of positives (%)								
	A-	Tws	S-spp	P-spp	H-spp	T-spp	Total	
	spp							
Breed								
Local Area	5	7	8	2	4	3	29	
Gender								
Male Animal	3	4	5	0	3	1	16	
Female Animal	2	3	3	2	1	2	13	



Figure (2). Parasites according to breed and genders (Source: Author)

CONCLUSION

Parasitic diseases in domesticated pets provide an important risk for the health of the animals and the well-being of humans. Common parasites, including as fleas, ticks and worms, have the ability to spread illnesses to both pets and occasionally people. Regular veterinarian treatment, devotion to hygienic measures and maintaining hygiene in living environments are essential for prevention. In this research, we examined the occurrence of gastrointestinal parasites in household pets, to provide significant information on animal health management. A total of 60 fecal samples were gathered from a various range of animals (including dogs, goats, hens and cats) in Delhi, India. The collected specimens were subjected to the ether concentrations procedure and examined under a microscope to identify the existence of parasite ova or larvae. The responses had been evaluated using SPSS 22.0 application, employed descriptive and chi-square techniques. There was a total of six gastrointestinal parasites observed, with a total prevalence rate of 48.33%. The species identified were "Ascarisspp (A-spp), Strongyloidesspp (S-spp), Prosthogonimusspp (P-spp), Hymenolepsisspp (H-spp), Trichostrongylusspp (T-spp), Tapeworms (Tws)". This research is focused on a particular geographical area (Delhi, India) and a small sample size of 60 animals, which could limit the applicability of the outcomes to big populations and other places. Future research should evaluate the efficiency of targeted health education initiatives based on recognized parasites, aiming at reducing animal infections and minimize the possibility of animal disease transmission to humans across wide areas.



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