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Study on the occurrence of *Ancylostoma caninum* and associated risk factors in dogs of nomads

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Abstract

Dogs are domesticated as important companion animal by the nomadic families for rendering important services during migration. Nomads migrate during summer to high altitudes in the himalayan regions (up to august) and start downward migration in September along with their flocks for thriving during the winter season. In this study, 165 faecal samples were collected from the dogs and open areas inhabited by nomadic communities and processed for the *Ancylostoma caninum*, 29 samples were positive for *Ancylostoma caninum* with an overall prevalence of 17.57 percent. Highest prevalence of ancylostomiasis was found during summer season (18.94%) followed by monsoon (17.64%) and winter (10.52%). *Ancylostoma caninum* was found more frequently in dogs of young age (<1 year, 20.38%), as compared to middle age (1-7 year, 15.55%) and old age dogs (>7 year, 5.88%). Furthermore, the prevalence was higher in males as compared to females dogs (22.44% v/s 10.44%).

Keywords: *Ancylostoma caninum*, nomads, faecal, dogs

1. Introduction

Dogs act as carrier of many intestinal parasites and provide them and their livestock with the protection against wild beasts and with such close proximity some of them can infect humans, because of this, some of the dog parasites, such as *Ancylostoma* species are considered to be a significant public health problem, especially in developing countries and communities that are socio-economically backward and due to poor hygiene and lack of veterinary attention and zoonotic awareness, exacerbate the risk of disease transmission [1]. The hookworm disease (Ancylostomosis) is a disease which is spread all over the world, but the most widespread parasite of hookworm species is *Ancylostoma caninum* and it harbors itself in dogs throughout the tropics and subtropics. *A. caninum* has gained importance in public health research and veterinary field, due to its high prevalence and zoonotic significance [2].

Ancylostomosis (hookworm disease) occurs mostly in warm and temperate climates, with the presence of adequate moisture and these factors favors the development of eggs of hookworm and subsequently development of the third stage infective larvae. Infections are most commonly present in pet animals [3] with primary sign like hemorrhagic diarrhea in puppies and chronic microcytic hypochromic anemia in adult dogs. [4-5]. The pet and strays dogs has an important role to play in the transmission of ancylostomosis. The transmission of this zoonotic parasite could be through direct or indirect contact through infected food and water [6].

Ancylostoma caninum has a socioeconomic and public health significance, every year infecting about 600 million people worldwide and resulting in up to 135,000 deaths annually [7]. Infection in human causes iron-deficiency anemia which may result in mental retardation and growth deficiencies, particularly in children. [8-9].

2. Materials and Methods

2.1 Faecal sampling

The research work was carried out at Division of Veterinary Public Health and Epidemiology, Faculty of Veterinary Sciences and Animal Husbandry, SKUAST-Jammu, Ranbir Singh Pura, Jammu during the period from March-2018 to February-2019.

For this study, a total of 165 canine faecal samples were collected from the vicinity of different localities of Jammu region inhabited by nomads and also from dogs kept in their custody using plastic gloves, during early morning hours in small and clean sterilized sample containers containing 3% formalin, then the containers were marked with number, sealed properly and placed into an ice box and brought to the laboratory for further processing and examination as

per standard method. Identification and confirmation of *ancylostoma* species eggs was done under microscope on the basis of its morphological characteristics [10].

3. Results

The overall prevalence rate was found to be 17.57 percent (29 of 165 samples) from the faecal samples processed. Highest prevalence of ancylostomiasis was found during summer season followed by monsoon and winter (Table 1, Figure 1). In this study, *Ancylostoma caninum* was found more frequently in dogs of young age (<1 year) as compared to middle age (1-7 year). Prevalance of *ancylostoma* was found to be lowest in old age dogs (>7 year). The age wise prevalence was 20.38%, 15.55% and 5.88% in young, middle and old aged dogs respectively. (Table-2, Figure-2). It was further noticed that the prevalence was higher in males as compared to females dogs. (22.44% v/s 10.44%) (Table-3, Figure-3).

Table 1: Season wise prevalence

Parameters	Total faecal samples examined	No. of positive	Percent prevalence
Summer (March-June)	95	18	18.94
Monsoon (July-Oct)	51	9	17.64
Winter (Nov-Feb)	19	2	10.52
Total	165	29	17.57

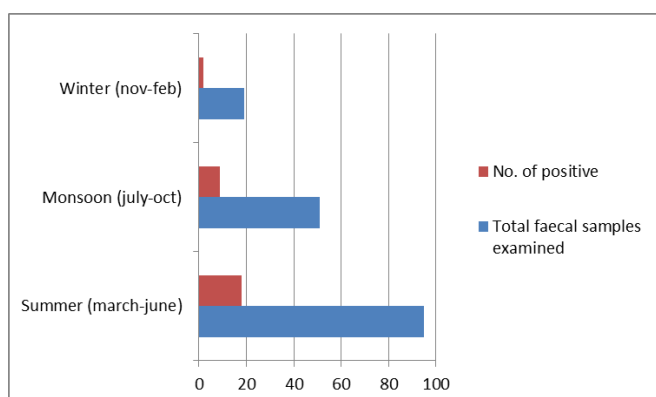


Fig 1: Season wise prevalence

Table 2: Age wise prevalence

Parameters (years)	Total faecal samples examined	No. of positive	Percent prevalence
Young age (<1)	103	21	20.38
Middle age (1-7)	45	7	15.55
Old age (>7)	17	1	5.88
Total	165	29	17.57

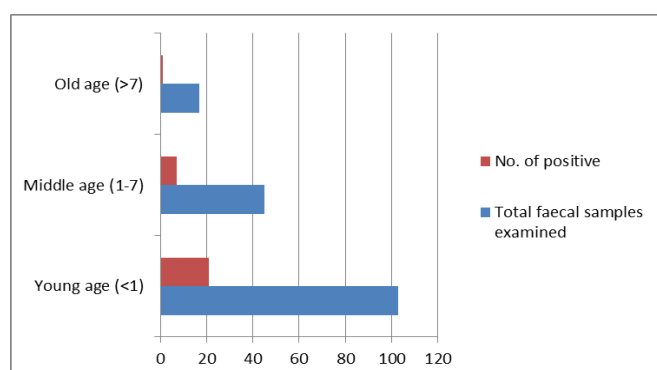


Fig 2: Age wise prevalence

Table 3: Sex wise prevalence

Parameters (years)	Total faecal samples examined	No. of positive	Percent prevalence
Male	98	22	22.44
Female	67	7	10.44
Total	165	29	17.57

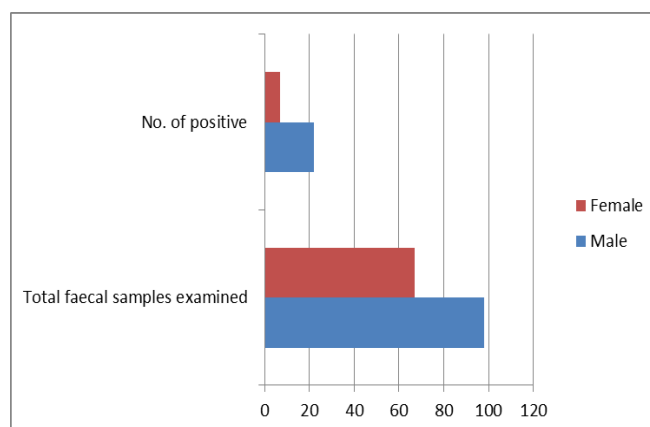


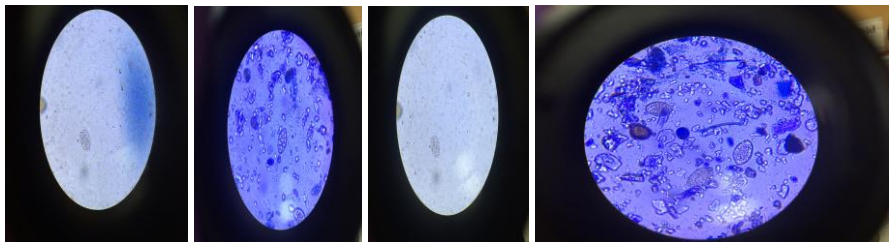
Fig 3: Sex wise prevalence

4. Discussion

Out of a total of 165 faecal samples of dogs examined, 29 were found positive for eggs of the *A. caninum* with overall prevalence of 17.57 percent. Brahmhatt, *et al.*, [1] also conducted similar study and recorded 22.95% prevalence of *A. caninum* in dogs at Anand. Hedge and Jagannath [11] also reported *Ancylostoma caninum* as predominant parasite in dogs of Matura, Uttar Pradesh, and Bangalore, respectively. Ramirez *et al.*, [12] reported (24.5%) prevalence of *Ancylostoma species* in stray dogs by faecal examination. Agnihotri *et al.*, [13] reported that the eggs of the hookworms were found predominantly (19.06%) in dogs of Himachal Pradesh. Oliveira-Sequeira *et al.*, [14] recorded highest amount of egg counts in the months of summer with a peak occurrence during April and May which correlates with the present study. Highest prevalence in these months may be due to relatively higher environmental temperature and rainfall as higher environmental temperature favours the release of the larvae from the eggs and is the most favorable condition for the survival of the parasite, thus influences the prevalence of the parasites. Problem of water lodging during the high rainfall is also a risk factor which is associated with the higher prevalence of the parasites during these months [14]. Apart from all these studies Ali *et al.*, [15] encountered very low 3.22% prevalence of *A. caninum* in contaminated soil samples collected from slums of Lahore. Godara *et al.*, [16] who reported low prevalence of 13.3% for hookworm (*A. caninum*) eggs in Jaipur. This may occur due to less hot humid climate availability in the study area. Summer shows the highest seasonal prevalence followed by monsoon and the least in winter in this study. The above findings were in accordance with the findings of Andresiuk *et al.*, [17] and Tarafder and Samad [18] who stated optimum temperature and humidity plays an important role for the development of eggs of hookworms with their subsequent development to third stage infective larvae. The bionomics of hookworm larvae is favored by these ambient temperature and humidity. Prevalance of *ancylostoma* species was recorded to be higher in males as compared to females dogs in present study. Lefkaditis *et al.*, [19] also examined 952 faecal samples, out of

which 18 (1.89%) recorded to be positive for *A. caninum* with 11 belonging to male and the 7 to female dogs. He further found that 12 positive samples were from young and remaining 6 from adult dogs. The findings of Lefkaditis *et al.*,^[19] is in agreement with the outcome of this study. Sowemimo and Asaolu^[20] found that the prevalence of ancylostoma species was highest in dogs of age Group 0-6 months. Das *et al.*,^[21] also reported that the hookworm infections were common in the age group of 2 months to 6 years (26.48%) in pet dogs.

Mitra *et al.*,^[22] and Oliveira-Sequeira *et al.*,^[14] also recorded higher infection in adult males (29.41%) than in adult females (14.61%) which is in agreement with the result of our present study. This may be due to the hormones activity that play an important role, also due to the individual hormonal status of males and females. This may require further investigation.



Ancylostoma caninum eggs

6. References

- Brahmbhatt NN, Patel PV, Hasnani JJ, Pandya SS, Joshi BP. Study on prevalence of ancylostomosis in dogs at Anand district, Gujarat, India. *Veterinary World*. 2015; 8(12):1405-1409.
- Obiukwu MO, Onyali IO. Comparative efficacy of ivermectin, levamisole, mebendazole and piperazine against *Ancylostoma caninum* in experimentally infected pups. *Animal Research International*. 2006; 3(3):540-544.
- Krishnabhanu CH, Vardhani VV. Pathological changes induced in mice due to experimental infection of canine hookworm larvae. *Bioscan*. 2013; 8(3):893-895.
- Sharma R, Singh BB, Gill JPS, Jenkins E, Singh B. Canine parasitic zoonoses in India: status and issues. *Revue scientifique et technique (International Office of Epizootics)*, 2017, 36(3).
- Lamb J, Napier M, Mukaratirwa S. PCR-based identification reveals unique Southern African internal transcribed spacer (ITS) haplotypes of hookworms (*Ancylostoma*) of dogs from the Durban metropole, South Africa. *African Journal of Biotechnology*. 2012; 11(8):2099-2106.
- Eguia-Aguilar P, Cruz-Reyes A, Martinez-Maya JJ. Ecological analysis and description of the intestinal helminths present in dogs in Mexico City. *Veterinary Parasitology*. 2005; 127:139-146.
- Hotez PJ. One World Health: Neglected Tropical Diseases in a Flat World. *PLOS Neglected Tropical Diseases*. 2009; 3(4): e405. doi:10.1371/journal.pntd.0000405.
- Albonico M, Crompton DW, Savioli L. Control strategies for human intestinal nematode infections. *Advances in Parasitology*. 1999; 42:277-341.
- Crompton DWT. The public health importance of hookworm disease. *Parasitology*. 2000; 121:39-50.
- Soulsby EJJ. *Helminths, arthropods and protozoa of domesticated animals*, 7th edition, 1982, 119-122.
- Hedge KS, Jagannath MS. Survey of parasites of digestive tract of dogs in Bangalore. *Mysore Journal of Agricultural Sciences*. 1975; 8(4):597-601.
- Ramirez-Barrrios RA, Barboza-Mena G, Munoz J, Angulo-Cubillan F, Hernandez E, Gonzalez F *et al.* Prevalence of intestinal parasites in dogs under veterinary care in Maracaibo, Venezuela. *Veterinary Parasitology*. 2004; 121:11-20.
- Agnihotri RK, Sharma D, Sharma Y. Incidence of gastrointestinal helminths in dogs of Himachal Pradesh. *Journal of Veterinary Parasitology*. 2008; 22(2):89-90.
- Oliveira-Sequeira TCG, Amarante AFT, Ferrari TB, Nunes LC. Prevalence of intestinal parasites in dogs from Sao Paulo State, Brazil. *Veterinary Parasitology*. 2002; 103:19-27.
- Ali SA, Akhtar T, Mahmood K, Safi WA. Spatial distribution of ancylostomiasis in soil of slums of Northren Lahore. *Journal of Agricultural Veterinary Sciences*. 2013; 4(1):20-25.
- Godara R, Sharma RL, Sharma SC, Sharma DK. Parasitic infection in dogs in semi-arid Jaipur (Rajasthan). *Journal of Veterinary Parasitology*. 2010; 24(1):83-86.
- Andresiuk V, Sardella N, Denegri G. Seasonal fluctuations in prevalence of dog intestinal parasites in public squares of Mar del Plata city, Argentina and its risk for humans. *Revista Argentina de Microbiología*. 2007; 39:221-224.
- Tarafder M, Samad MA. Prevalence of clinical diseases of pet dogs and risk perception of Zoonotic infection by dog owners in Bangladesh. *Bangladesh Journal of Veterinary Medicine*. 2010; 8(2):163-174.
- Lefkaditis AM, Koukeri ES. Prevalence of hookworm parasites in dog from the Area of Thessaloniki and their zoonotic importance. *Bulletin*. 2006; 63:297-303.
- Sowemimo OA, Asaolu SO. Epidemiology of intestinal helminth parasites of dogs in Ibadan, Nigeria. *Journal of Helminthology*. 2008; 82:89-93.

21. Das SS, Kumar D, Sreekrishnan R, Ganesan R. Gastrointestinal parasitic infections in dogs of Puducherry. *Journal of Veterinary Parasitology*. 2009; 23(1):77-79.
22. Mitra K, Ghosh A, Ghosh GL, Mitra S, Chaudhuri S, Biswas G. Ancylostomiasis in pet dog. *Indian Veterinary Medical Journal*. 1990; 14(3):215-217.