Original Research Article

The Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital in Southern India - A Retrospective Study

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ABSTRACT

Intestinal parasitic infections are highly prevalent among the general population in developing countries and these infections can lead to a number of adverse effects. The aim of this study was to determine the prevalence of common intestinal parasitic infection in our area. A total of 200 stool samples were collected from Microbiology Laboratory for a period of six months (August 2015 to January 2016). The samples were examined for protozoa and helminths infection by routine microscopy. In our study the prevalence of Intestinal parasitic infection is 77%. There are ten different parasites encountered. The most common parasites identified were Ascaris lumbricoides 100(64.93%), followed by Taenia spp 18(11.68%), Ancylostoma duodenale 15(9.74%), Strongyloides stercoralis 6(3.89%). The other parasites present were Entamoeba histolytica, Entamoeba coli, Trichuris trichiura, Enterobius vermicularis, Giardia lamblia and Hymenolepis nana. Prevalence of helminths was higher than protozoa in the present study. It is an important public health problem. It is necessary to develop effective prevention and control strategies including periodic deworming, health education and environmental hygiene.

Keywords
Prevalence, Intestinal Parasites, Infection, Protozoa, Helminths.

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Introduction

Intestinal parasitic infection is one of the major health problems in several developing countries, including India (Shrihari et al., 2011). It is estimated that some 3.5 billion people are affected, and that 450 million are ill as a result of intestinal parasites and protozoan infections worldwide, the majority being children, as they cause iron deficiency anemia, growth retardation in children and other physical and mental health problems (Ganesh Kumar et al.).

Intestinal parasitic infection ranges from 12.5% to 66% in India with variation in prevalence of individual parasites (Ramya Shree et al., 2015).

The prevalence of different parasitic diseases varies from one country to another and depends upon environmental, social and economical factors such as poverty, malnutrition, personal and community hygiene population density, unavailability of
drinking water, poor sanitary facilities and hot and humid tropical climate (Rajvir Singh et al., 2013).

The intestinal parasitic infection is acquired by ingestion, inhalation or penetration of skin by infective forms and their high incidence is closely correlated to poverty and poor environmental hygiene (Anil kumar et al., 2016). The most common parasitic causing infections globally are Ascaris lumbricoides (20%) hookworm (18%), Trichuris trichiura (10%) and Entamoeba histolytica (10%). Most of these are transmitted through soil, there route of transmission being faecally contaminated fingers or sometimes migrate through skin to intestine (Swapna Kotian et al., 2014).

The parasites are important causal agents of gastrointestinal disorders such as diarrhoea, dysentery, vomiting, lack of appetite, haematuria, abdominal distension and sometimes mentally related disorders. Moreover, heavy chronic infections with Ascaris lumbricoides and Hookworms (Ancylostoma duodenale) may cause malnutrition and anaemia in high risk groups (Mazigo et al., 2010). The purpose of this study was to determine the prevalence of common intestinal parasitic infection at our place.

Materials and Methods

Specimen collection

A retrospective study was carried out in the Department of Microbiology for a period of six months from August 2015- January 2016. Two hundred patients with symptoms suggestive of parasitic infections coming to our tertiary care hospital for whom stool examination for parasites were advised by clinicians were included in the study.

The patients were provided wide mouthed clean, dry, properly labeled plastic container for collection of samples and recommend 5 grams of solid or 10 ml of liquid stool. The stool samples were examined within 1-2 hours of collection.

Microbiological examination

Macroscopic examination was done to look for colour, consistency, presence of mucus and blood, and presence of parasitic structures such as proglottids, scolices, adult tapeworm, Enterobius, Ascaris, or Hook worm. For microscopic examination, saline wet mount and Lugol’s iodine wet mount was prepared. Saline wet mount was done to detect protozoal trophozoites and helminthic eggs or larvae and iodine wet mount was done to detect cysts.

Saline and iodine wet mount were prepared by adding a drop of saline and lugol’s iodine for clean glass slides and then mixed with a small amount of stool. Coverslips were placed and the slides were visualized microscopically first at low power to detect trophozoites or ova and then at higher power for morphologically details. (Cheesbrough, 2014).

Results and Discussion

A total of 200 stool samples were examined of which 110 were from male and 90 were from female of which 154 (77%) revealed presence of some kind of parasites. It was noted that out of 154 positive samples, parasitosis was seen more in female patients 74/90 (82.22%) when compared to males 80/110 (72.72%). The overall prevalence of intestinal parasitosis was found to be highest among patients aged >15 years (80.83%), followed by among children aged < 15 years (71.25%) (Table: 1).
Among various parasites detected, the most common parasite identified were *Ascaris lumbricoides* 100(64.93%), followed by *Taenia* spp 18(11.68%), *Ancylostoma duodenale* 15(9.74%), *Strongyloides stercoralis* 6(3.89%), *Entamoeba histolytica* 5(3.24%), *Entamoeba coli* 5(3.24%), *Trichuris trichiura* 2(1.29%), *Enterobius vermicularis* 1(0.64%), *Giardia lamblia* 1(0.64%), and *Hymenolepis nana* 1(0.64%) respectively (Table: 2).

Among the intestinal Helminths, *Ascaris lumbricoides* were predominant parasites present in 100(64.93%) cases followed by *Taenia* spp 18(11.68%), *Ancylostoma duodenale* 15(9.74%), *Strongyloides stercoralis*, *Trichuris trichiura*, *Enterobius vermicularis* and *Hymenolepis nana* (Figure 1:). Among the intestinal protozoa, *Entamoeba histolytica* present in 5(3.24%) cases followed by *Entamoeba coli* 5(3.24%) and *Giardia lamblia* 1(0.64%) cases (Figure: 2).

In the developing world intestinal parasitic infection is still an important cause of morbidity and mortality. The present study results showed the occurrence of several intestinal parasites of public health importance in people residing this area. The prevalence was found to be 154 (77%) but high when we compare it with the study from Mangalore by Brig Hemant Kumar et al., 2014, showing a prevalence rate of 49.38% varies studies have shown that prevalence rate is India ranges from 12.5% to 66% with varying prevalence of intestinal parasites may be due to variations in factors like quality of drinking water supply, sanitation and other environmental conditions.

The prevalence rate in our study was high 154 (77%) among intestinal helminths 143 (92.81%) and intestinal protozoa 11(7.12%). In the present study it was observed that prevalence of intestinal parasitic infection was seen more among females (82.22%) then the males (72.72%). The overall prevalence of intestinal parasitosis was found to be highest among patients aged >15 years (80.83%), followed by among children aged < 15 years (71.25%). This can be better explained as, in addition to household work women in this region are also engaged in handling of livestock and in field work too and thus are comparatively more exposed to contaminated soil and water, a major predisposing factor for infection.

The isolation of the Helminths ova was higher than that of protozoan cysts. The most common helminths infection in our study was *Ascaris lumbricoides* 100(64.93%) was highest followed by *Taenia* spp 18(11.68%), *Ancylostoma duodenale* 15(9.74%) and *Strongyloides stercoralis* 6(3.89%) in our study. Many studies have shown *Ascaris lumbricoides* as predominant parasite infecting humans but in our study it was high infective rate 100(64.93%) when compared to other studies was low by (Brig Hemant Kumar et al., 2014; Anil Kumar et al., 2016 and by Dnyaneshwari et al., 2014). The prevalence of intestinal *Taeniasis* is very low in previous studies (Shrihari et al., 2011; Brig Hemanth et al., 2014 and Rajvir et al., 2013) but in our study 18(11.68%) cases, probably due to mixed diet and consumption under cooked pork and beef by the population.

*Ancylostoma duodenale* 15 (9.74%) cases showed low prevalence in our study when compared to other study (Dnyaneshwari et al., 2014). Prevalence of Hookworm infection can be attributed to walking barefoot in the fields as the infection results from penetration of the skin by filariform larva.
Table.1 Age and gender wise distribution of positive samples (n= 154)

| Category          | Total sample tested | Positive | Percentage (%) |
|-------------------|---------------------|----------|----------------|
| Age < 15 years    | 80                  | 57       | 71.25          |
| Age > 15 years    | 120                 | 97       | 80.83          |
| Male              | 110                 | 80       | 72.72          |
| Female            | 90                  | 74       | 82.22          |

Table.2 Distribution pattern of different intestinal parasites (n=154)

| Name of parasites       | No. of positive | Percentage (%) |
|-------------------------|-----------------|----------------|
| Ascaris lumbricoides    | 100             | 64.93          |
| Taenia spp              | 18              | 11.68          |
| Ancylostoma duodenale   | 15              | 9.74           |
| Strongyloides stercoralis | 6              | 3.89           |
| Entamoeba histolytica   | 5               | 3.24           |
| Entamoeba coli          | 5               | 3.24           |
| Trichuris trichiura     | 2               | 1.29           |
| Enterobius vermicularis | 1               | 0.64           |
| Giardia lamblia         | 1               | 0.64           |
| Hymenolepis nana        | 1               | 0.64           |
| Total                   | 154             | 99.93          |

Fig.1 Distribution of intestinal helminthes (n= 143)
The other parasite as *Strongyloides stercoralis* 6(3.89%) cases showed low prevalence in our study when compared to other study (Dnyaneshwari et al., 2014 and Ganesh Kumar et al.) this could be due to variation in geographical distribution of different parasites.

The prevalence of *Entamoeba histolytica*, *Entamoeba coli* 5(3.24%) and followed by *Giardia lamblia* 1(0.64%) is low in our study, when compared to other study, the most common intestinal parasite observed was *Entamoeba histolytica* 57.14% and 55% (Ghanshyam et al., 2016 and Dnyaneshwari et al., 2014) have also reported, likewise Giardiasis (45% Dnyaneshwari et al., 2014 and 10.53% Shrihari et al., 2011). The prevalence of *Trichuris trichiura* 2 (1.29%) infective rate is high, another study shows that was very low positivity rate have reported (Ganesh Kumar et al.). The other parasites are *Enterobius vermicularis* 1(0.64%) is high positivity rate in our study, this is in contrast to other studies (Rajvir et al., 2013) and *Hymenolepis nana* 1(0.64%) is very low in our study when compared to other study shows highest infective rate (Ghanshyam et al., 2016 and Ganesh Kumar et al.).

In conclusion, the present study shows that, intestinal parasitic infection is a major public health problem. *Ascaris lumbricoides* signifies the need of public awareness regarding use of latrine, water source protection from fecal contamination, proper sanitation and hygienic behavior along with the community to the mass deworming program.

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**References**

Anil Kumar, Deepesh Kumar, Sujeeet Kumar. 2016. Parasitic Infection: A Prevalence Study at a Tertiary Care Hospital, *Int. J. Health Sci. Res.*, 6(1): 154-157.

Brig Hemant Kumar, Capt Kalpana Jain, Maj Rahul Jain. 2014. A study of
prevalence of intestinal worm infestation and efficacy of anthelminthic drugs, *Med. J. Armed Forces India*, 144-148.

Cheesbrough, M. 2014. Parasitological tests In: District laboratory in tropical countries, 2nd ed. New York: Cambridge University Press, pp. 178-306.

Dnyaneshwari Ghadage, Archana, B., Wankhade, Rupali, J., Mali. et al. 2014. Pattern of Intestinal parasitic Infections in patients visiting To Rural Tertiary Care Teaching Hospital in Pune, *Asian J. Biomed. Pharma Sci.*, 4(34): 51-53.

Ganesh Kumar Singh, Kamal Prasad Parajuli, Medhavi shreshtha, et al. The Prevalence of Intestinal Parasitic Infestetion in a Tertiary Care Hospital-a retrospective study, *J. Nobel Med. Coll.*, vol.2, No.1 Issue3.

Ghanshyam Kavathia, Manish Pattani, Anil Chaudhry, et al. A Prevalence study of Intestinal parasitic Infections in Symptomatic Children at Tertiary Care Hospital in Rajkot City of Gujarat (India), IOSR. *J. Den. Med. Sci.*, 15(5): 13-15.

Mazigo, H.D., E.E. Ambrose, M., Zinga, et al. Prevalence of Intestinal Parasitic infection among patients attending Bugando Medical Centre in Mwanza, north-western Tanzania: a retrospective study, 1-7.

Rajvir Singh, Pooja Singla, Madhu Sharma, et al. 2013. Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital in Northern India: Five year retrospective study, *Int. J. Curr. Microbiol. App. Sci.*, 2(10): 112 -117.

Ramya Sree, A., Prakash, R., Sunil Kumar, et al. 2015. Occurrence of Intestinal Parasitic Infections and its correlation with heamotological Parameters in a tertiary care centre, *J. Int. Med. Dentistry*, 2(1): 47-52.

Sanjeev Sahai and Sana Jamali. 2015. Changing trend in prevalence of intestinal parasites in patients attending a tertiary care hospital in Lucknow, Ind. *J. Basic & App. Med. Res.*, 4(2): 560-567.

Shrihari Narayan, Kumidini, T.S.D., Mariaraj, J. et al. 2011. The Prevalence of Intestinal Parasitic Infections in a Tertiary Care Hospital- a retrospective study, *J. Pharma. Biomed. Sci.*, 12(08).

Swapna Kotian, Munesh Sharma, Deepak Juyal, et al. 2014. Intestinal Parasitic Infection -intensity, prevalence and associated risk factors a study in the general population from the Uttarakhand hills, *Int. J. Med. Public Health*, 4: 422-425.