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

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A B S T R A C T

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.

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 *Taenia*sis 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)

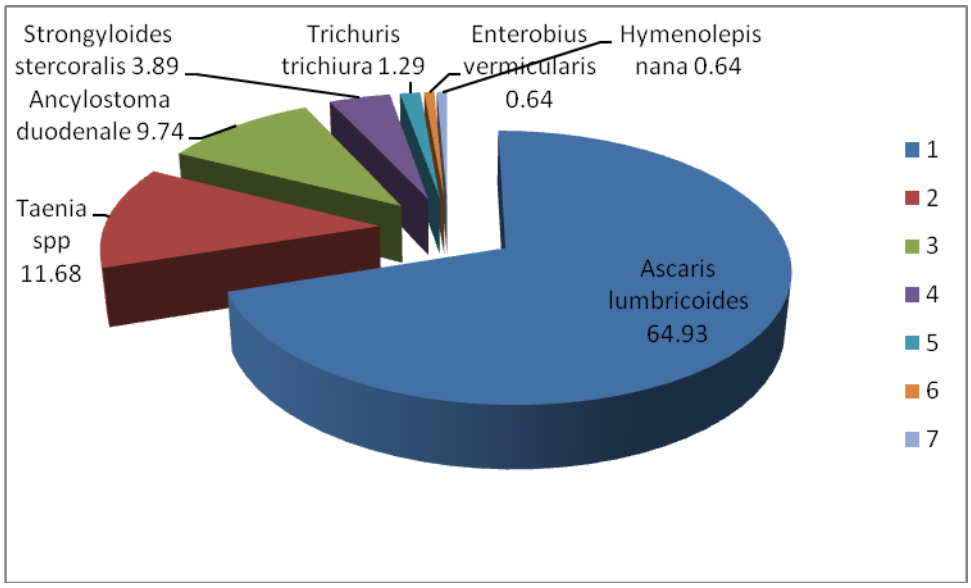
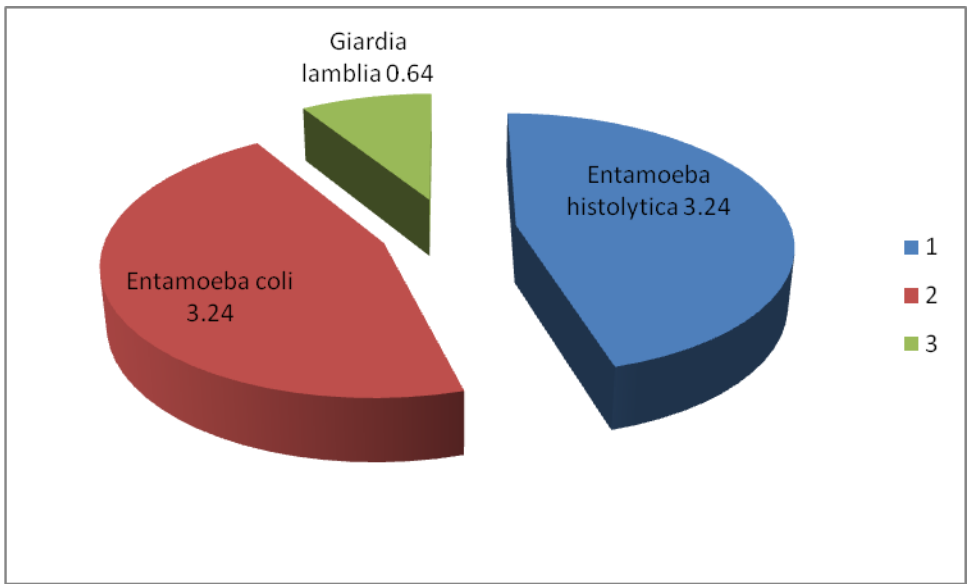


Fig.2 Distribution of intestinal protozoa (n= 11)



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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