

Original Research Article

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Prevalence of Intestinal Parasitic Infections at a Tertiary Care Hospital: A Retrospective Study

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ABSTRACT

Intestinal parasitic Infections are one of the major health problems in developing countries like India. The prevalence of different parasitic infections varies from one place to another and depends on many factors such as socio-economic status, hygiene, water supply, sanitation, population density, nutritional status and climatic conditions. This was a retrospective study conducted from January 2017 to December 2018 at a tertiary care hospital, Kalaburagi which is a dry, hot place. Stool samples sent from different departments irrespective of age were included in the study. Sample was collected in wide mouthed sterile screw capped and was subjected to routine macroscopic and microscopic examination. A total of 726 stool specimens were examined for probable parasitic infection. The prevalence of Intestinal parasitic Infections at our hospital was 8.12%. The parasites detected was *Entamoeba histolytica* (55.93%), *Giardia lamblia* (27.12%), *Hymenolepis nana* (5.08%), *Ascaris lumbricoides* (3.39%), *Strongyloides stercoralis* (3.39%), *Taenia* species (3.39%), *Enterobius vermicularis* (1.70%). The present study highlights the importance of knowledge of intestinal parasitic infections of particular region, which help the clinicians for diagnosis and management. Prevalence rate in our study was low which indicates that there is improvement in personal hygiene, drinking water supply and sanitary practices.

Keywords

Intestinal parasitic infections, *Ascaris*, Stool samples

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Introduction

One of the major health problems in developing countries like India is Intestinal Parasitic Infections (IPI's). It is estimated that about 15-20% of world's population is suffering from parasitic infection. Overall prevalence in India ranges from 12.5% to 66%. The prevalence of different parasitic infection varies from one place to another and depends on many factors such as socio-

economic status, hygiene, water supply, sanitation, population density, nutritional status and climatic conditions.¹The transmission of parasitic infection takes place by ingestion, penetration of intact skin and rarely by inhalation of infective forms.² These infections are more common in children and can lead to nutritional deficiencies, anemia, impaired learning, and growth retardation.¹ The most important drawback of IPI's is that about 90% of infected individuals remain

asymptomatic.³ The most common parasitic infestations reported globally are *Ascaris* (20%), *Ancylostoma duodenale* (18%), *Trichuris trichiura* (10%), and *Entamoeba histolytica* (10%).⁴ Studies have been conducted in this region in the past about 8-10 yrs back with prevalence of 27.6% (Parameshwarappa *et al.*,)⁵. Though ours is a similar study, we wanted to know the present prevalence and change in the trend of infection. The objective of the study was to know the prevalence of intestinal parasitic infections at a tertiary care hospital by collecting retrospective data.

Materials and Methods

This is a retrospective study which was conducted at Microbiology laboratory, ESIC hospital, Kalaburagi. The data of last two years was collected *i.e.* from January 2017 to December 2018. Stool samples sent from different departments irrespective of age were included in the study.

Sample was collected in wide mouthed sterile screw capped, labelled containers without preservative. All faecal samples were subjected to routine macroscopic and microscopic examination.

For microscopic examination, saline wet mount and Lugol's iodine wet mount was prepared

The stool specimen was examined by

1. Macroscopic examination: The colour, consistency, presence of mucus and the nature of the faeces were recorded. The stool specimens were examined for the presence of adult forms of the helminths either with the naked eye or with the aid of a hand lens.

2. Direct microscopic examination by using saline and iodine preparations: On a 1mm thick microscopic slide, a small amount of

stool sample was emulsified in 1-2 drops of saline or iodine solution. A cover slip was placed on it by taking care that the preparation was free of air bubbles and macroscopic debris observed under low (10x) and high (40x) power.

Results and Discussion

A total of 726 stool samples were examined, out of which 59 (8.12%) were found to be positive for parasites. (Graph 1)

The parasites detected in decreasing frequency were *Entamoeba histolytica*, *Giardia lamblia*, *Hymenolepis nana*, *Ascaris lumbricoides*, *Strongyloides stercoralis*, *Taenia species*, *Enterobius vermicularis* (Table 1; Graph 2).

Among the parasites detected, protozoa (83.05%) were more compared to helminths (16.95%). The parasites with highest number were *Entamoeba histolytica* followed by *Giardia lamblia* and *Hymenolepis nana*.

Most of the *Entamoeba histolytica* infections (n=20) were seen in adults and (n=13) in children (Figure 9 and 10).

Among 16 cases of *Giardia lamblia* infection, 13 cases were seen in children, age ranging from 8 months to 10 yrs.

Three cases of *Giardia lamblia* infection showed only trophozoites (Figure 2), 3 cases showed both cysts and trophozoites and rest 10 showed only cysts (Figure 11).

All the 3 *Hymenolepis nana* infection (Figure 4) and 2 *Ascaris lumbricoides* infection were seen in school going children (Figure 7 and 8).

The *Taenia species* (*Taenia saginata*) was identified based on morphology of the gravid segment and history of consumption of beef

(Figure 5 and 12). Two *Stroglyoides stercoralis* larval forms were identified from stool specimen (Figure 1). *Enterobius vermicularis* adult worm and eggs (Figure 6

and 3) were identified by taking National Institute of Health (NIH) swab from 6yr old child who had severe pruritis ani.

Table.1 Distribution of different intestinal parasitic infections

Parasite	Number of Positives	Percentage (%)
<i>Entamoeba histolytica</i>	33	55.93
<i>Giardia lamblia</i>	16	27.12
<i>Hymenolepis nana</i>	03	5.08
<i>Ascaris lumbricoides</i>	02	3.39
<i>Stroglyoides stercoralis</i> larva	02	3.39
<i>Taenia species</i> (Proglottid and eggs)	02	3.39
<i>Enterobius vermicularis</i> (Adult worm and eggs)	01	1.70

Table.2 Age wise distribution of intestinal parasitic infections

Parasite	Age (Years)				
	0-20	20-40	40-60	60-80	>80
<i>Entamoeba histolytica</i>	13	9	6	04	01
<i>Giardia lamblia</i>	13	2	0	01	0
<i>Hymenolepis nana</i>	03	0	0	0	0
<i>Ascaris lumbricoides</i>	02	0	0	0	0
<i>Strongyloides stercoralis</i>	0	2	0	0	0
<i>Taenia species</i>	0	0	02	0	0
<i>Enterobius vermicularis</i>	01	0	0	0	0
Total	32	13	08	05	01

Table.3 Gender wise distribution of intestinal parasitic infections

Parasite	Gender		Total
	Male	Female	
<i>Entamoeba histolytica</i>	18	15	33
<i>Giardia lamblia</i>	9	7	16
<i>Hymenolepis nana</i>	1	2	3
<i>Ascaris lumbricoides</i>	2	0	2
<i>Strongyloides stercoralis</i>	1	1	2
<i>Taenia species</i>	0	02	2
<i>Enterobius vermicularis</i>	0	1	1
Total	31	28	59

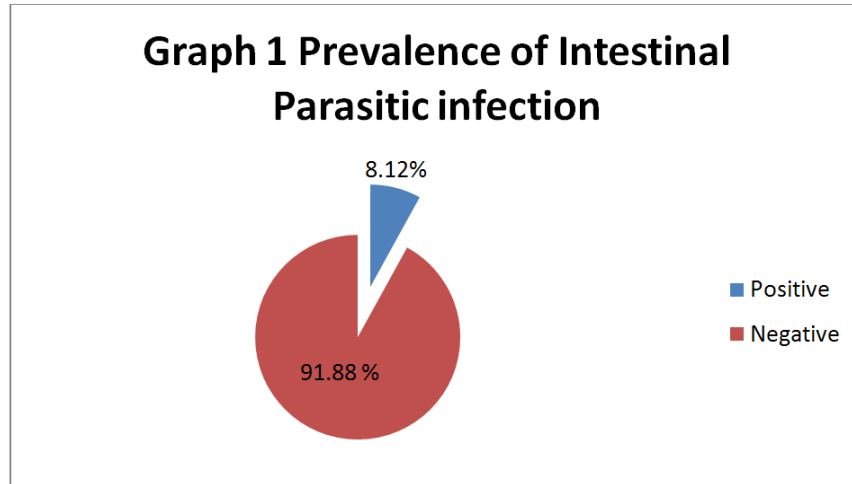
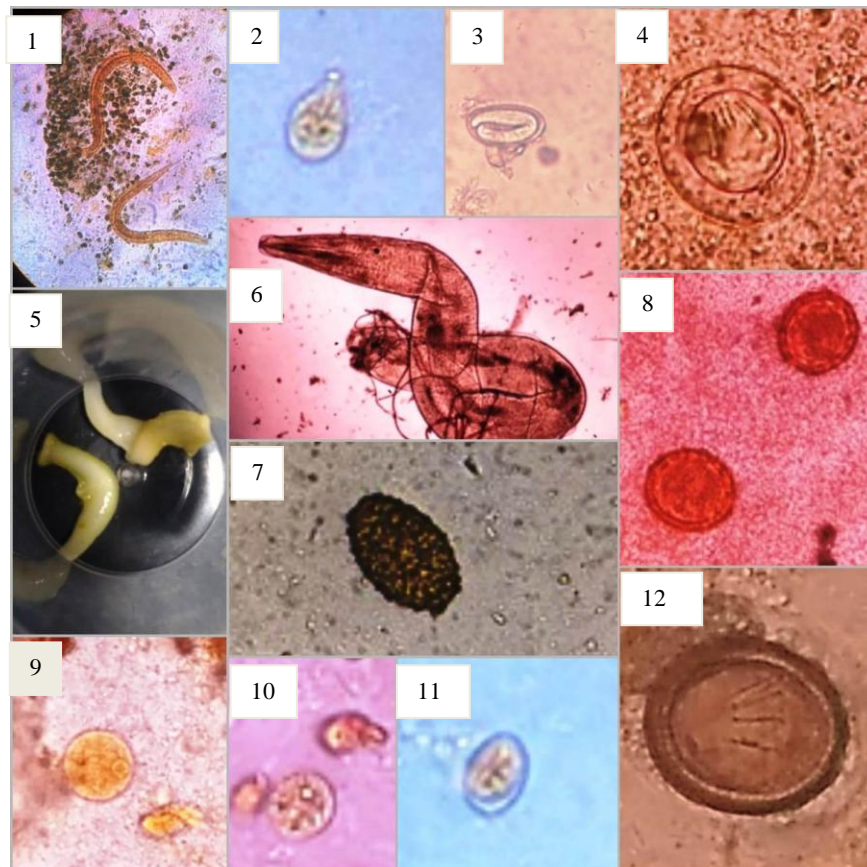


Figure.1 Larva of *Strongyloides stercoralis* 2. Trophozoite of *Giardia lamblia* 3. Egg of *Enterobius vermicularis* 4. Egg of *Hymenolepis nana* 5. Proglottid of Tapeworm 6. Adult worm of *Enterobius vermicularis* 7. Unfertilized egg of *Ascaris* 8. Fertilized egg of *Ascaris lumbricoides* 9&10. Cyst of *Entamoeba histolytica* 11. Cyst of *Giardia lamblia* 12. Egg of *Taenia* species



Parasitic infection is a matter of concern in a developing country like India, because it is endemic and its infection particularly in children can result in high morbidity and mortality. So knowledge about the intestinal parasites prevalent in that particular area is important for diagnosis and management. In the present study we have collected a data of 726 patients who were symptomatic as well as asymptomatic.

The prevalence of intestinal parasitic infections at our tertiary care hospital was 8.12% which is comparable with that of a study from conducted by Rajvir Singh *et al.*,⁶ (6.68%) and Anil kumar⁷ (9.21%) from north India. And also result was similar with respect to detection rate among protozoa and helminths, Protozoa were being more, with highest detection of *Entamoeba histolytica* followed by *Giardia lamblia* (Anil kumar *et al.*) and vice-versa in case of Rajvir Singh *i.e.*, Highest *Giardia* followed by *Entamoeba histolytica*. The reason for highest protozoa could be due to periodic deworming which has taken care of helminths.

When compared to the study by Parameshwarappa *et al.*,⁵ conducted at Kalaburagi showed higher prevalence rate of 27.6%. The difference could be attributed to use of many concentration techniques which resulted in higher detection rates, inclusion of rural health centre and moreover the study was conducted 8-10 yrs back. The low prevalence rate in our study could be explained due to improvement in the sanitation, drinking water supply, personal hygiene, awareness and not including concentration techniques for diagnosis. Some similarities were seen like highest parasite found was *Entamoeba histolytica* followed by *Giardia lamblia*, however we could not detect Hookworm and *Trichuris trichura* egg in our study. To know the exact prevalence of intestinal parasitic infection of this region,

further it requires population based prospective study.

Regarding age wise distribution of parasitic infections, most of the infections were seen in paediatric age group (Table 2) especially *Giardia lamblia* and *Hymenolepis nana* which was comparable with that of study from Moradabad⁸, Parameshwarappa *et al.*,⁵, Ismat rehana *et al.*,¹ There are variations in other studies where adults were more infected with parasites, so definitely this depends on various factors like personal hygiene, knowledge about hand hygiene, geographical area and health education.⁷

With respect to gender wise distribution, males were most commonly infected compared to females (Table 3) which corroborated with the study conducted by Shyamal Kanti Pal *et al.*, Ismat Rehana *et al.*,¹ Rajvir singh *et al.*,⁶ Yogendra Pratap mathuria⁸, Shrihari Narayan *et al.*,⁹ Taruna singh *et al.*,¹⁰.

No hookworm was detected from our study. This could be due to more use of footwear by labourers and farmers and decrease in the number of open defaecation in villages.

So the present study revealed the changing trends of intestinal parasitic infections which may be perhaps due to changes in socioeconomic status, availability of portable water, environmental sanitation and awareness.

In conclusion, prevalence of intestinal parasitic infection at a tertiary care hospital, Kalaburagi is 8.12%. *Entamoeba histolytica* and *Giardia lamblia* are the most common parasitic infection in this place. The present study highlights the importance of knowledge of intestinal parasitic infections of particular region, which help the clinicians for diagnosis and management. Prevalence rate in our

study was low which indicates that there is improvement in personal hygiene, drinking water supply and sanitary practices.

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