



ISSN Print: 2394-7500  
 ISSN Online: 2394-5869  
 Impact Factor: 5.2  
 IJAR 2018; 4(6): 48-51  
 www.allresearchjournal.com  
 Received: 09-04-2018  
 Accepted: 10-05-2018

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## Prevalence of intestinal parasitic infection at a tertiary care hospital in Solapur, Maharashtra

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### Abstract

Intestinal parasitic infections (IPIs) constitute major health problems, especially in the tropical and subtropical regions. The aim of present study was to determine the prevalence of intestinal parasitic infection at tertiary care hospital in Solapur. A prospective study was carried out in Department of Microbiology, Dr. V.M. Govt. Medical College Solapur from January 2015 to June 2016. Total 250 samples were collected and examined both macroscopically and microscopically using wet mount and iodine mount. Modified Ziehl-Neelson staining method was performed for detection of Coccidian parasites. The overall prevalence of intestinal parasitic infection was found to be 56.40%. Female were affected more compared to male. Single parasite was observed in 95 (67.37%) stool samples, while 46(32.63%) showed mixed infections. The most common parasites identified were *Cryptosporidium parvum* and *Cyclospora cayetanensis* mixed infection in 45 (31.92%) patients followed by *E. histolytica* 40(28.36%), *Cryptosporidium parvum* 28(19.86%), *Giardia lamblia* 20(14.18%), *Cyclospora cayetanensis* 5(3.55%), *Taenia* spp 1(0.71%), *Ascaris lumbricoides* 1 (0.71%) and *E. histolytica* & *Giardia lamblia* mixed infection 1 (0.71%). Prevalence of IPI was found higher in our study. It is necessary to develop effective prevention and control strategies including health education and environmental hygiene to decrease prevalence of intestinal parasite.

**Keywords:** Intestinal parasites, prevalence, protozoal infections, helminthic infections

### 1. Introduction

Intestinal parasitic infections (IPIs) are important public health problem world wide, with high prevalence in developing countries like India [1]. Current assessments suggest that at least one third of the total population in the world is infected with intestinal parasites. It is estimated that about 3.5 billion people in the world are infected with intestinal parasites, among them 450 million are ill [2, 3]. Risk factors associated are low socioeconomic status, illiteracy, poor sanitary condition, lack of potable water supply and tropical hot humid climate [1, 4]. The prevalence of the intestinal parasitic infections depends largely on the diagnostic methods employed and the number of stool examinations done as well as it also varied from one geographical area to another [5].

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. The most common parasites causing infections globally are *Ascaris lumbricoides* (20%) hookworm (18%), *Trichuris trichiura* (10%) and *Entamoeba histolytica* (10%) [6]. IPIs leads to important ill effects like gastrointestinal disorders such as diarrhoea, dysentery, vomiting, lack of appetite, haematuria, abdominal distension and sometimes mentally related disorders. Apart from that heavy chronic infections with *Ascaris lumbricoides* and Hookworms (*Ancylostoma duodenale*) may cause malnutrition and anaemia in high risk groups [1]. The aim of present study was to determine the prevalence of intestinal parasitic infection in tertiary care hospital in Solapur.

### 2. Material and Method

The present study was carried out in Department of Microbiology Dr. V.M. Govt. Medical College Solapur from January 2015 to June 2016. Total 250 samples were collected in wide mouthed sterile screw capped, labelled containers without preservative from patients suggestive of parasitic infections.

Symptomatic patients in all age group from both gender were included in the study. Each stool sample was subjected to Macroscopic and microscopic examination [7, 8].

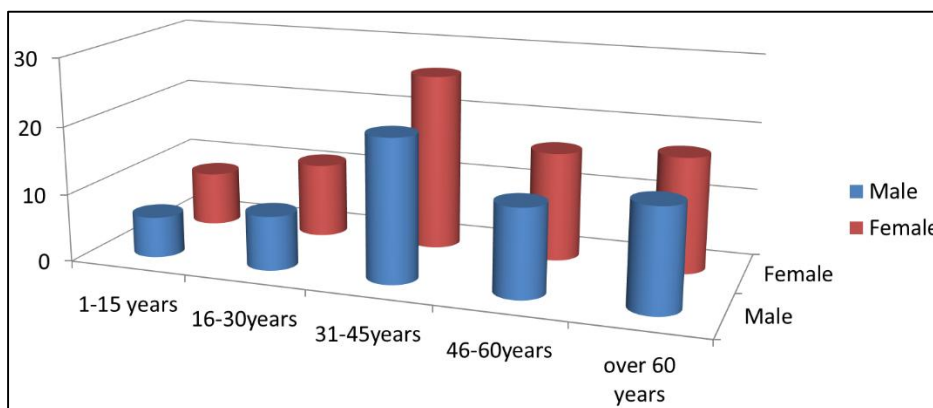
**Macroscopic examination:** Sample was examined macroscopically to look for colour, consistency, presence of mucus and blood, and presence of parasitic structures such as proglottids, scolices, adult tapeworm, Enterobius, Ascaris or Hook worm.

**Microscopic Examination:** The samples were examined microscopically for ova, cysts and trophozoites of parasites using saline and iodine mount on grease - free slide. Formal-Ether concentration technique was performed in those cases which were negative by saline preparation method but had strong clinical suspicion of intestinal parasitism. Slide was scanned under 10× and 40× objectives lenses of a light microscope. Saline mount is used mainly for the detection of intestinal protozoa trophozoites motility. Iodine mount allows the examination features of the protozoa and the

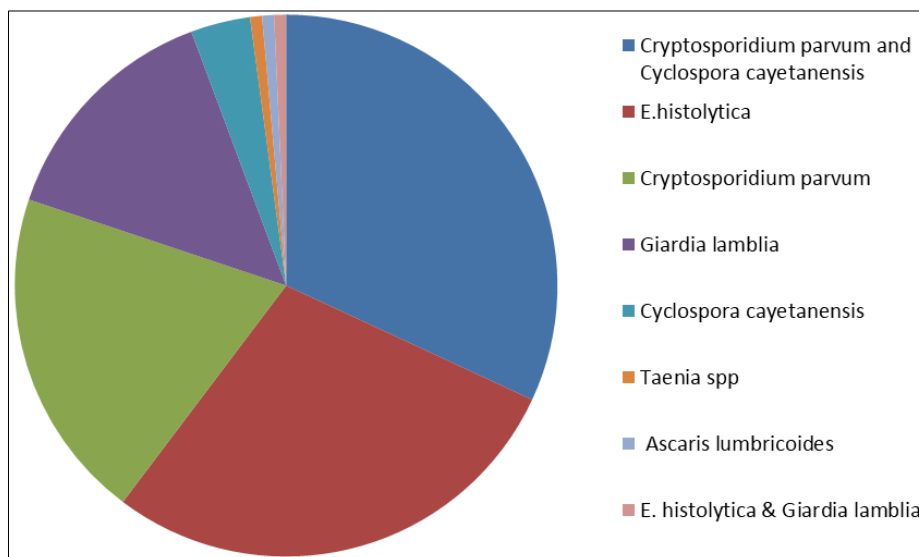
identification of cyst. Modified Ziehl-Neelson staining method was performed for detection of Coccidian parasites.

**3. Result**

In present study prevalence of IPIs was 56.40% (141/250). Females 54.60% (77/141) were more affected by IPIs compared to Males 45.39% (64/141) and it was more common in age group between 30-45 years [Figure 1]. It shows seasonal variation, more common in warmer season between April to September. Single parasite was observed in 95 (67.37%) stool samples, while 46(32.63%) showed mixed infections. The most common parasites identified were *Cryptosporidium parvum* and *Cyclospora cayetanensis* mixed infection in 45 (31.92%) patients followed by *E. histolytica* 40(28.36%), *Cryptosporidium parvum* 28(19.86%), *Giardia lamblia* 20(14.18%), *Cyclospora cayetanensis* 5(3.55%), *Taenia spp* 1(0.71%), *Ascaris lumbricoides* 1(0.71%) and *E. histolytica* & *Giardia lamblia* mixed infection 1 (0.71%) [Figure 2].



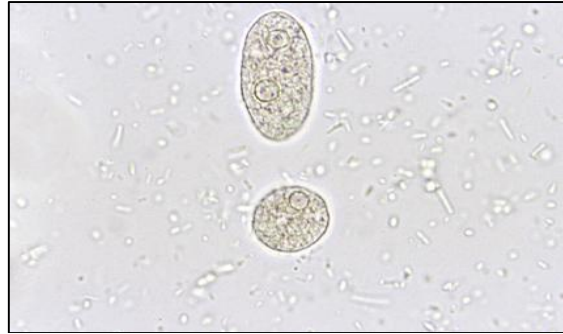
**Fig 1:** Age & sex wise distribution of cases



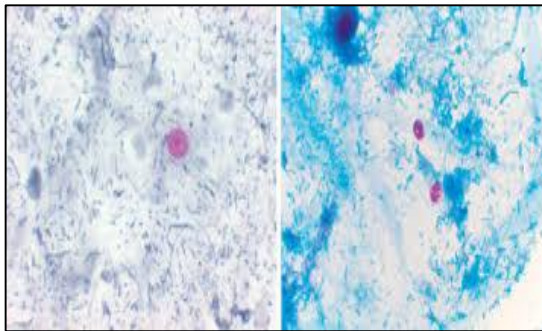
**Fig 2:** Distribution of various parasites in stool



Lambliia cyst (Iodine mount)



Histolytica cyst (saline mount)



Modified Acid fast stain showing oocyst of cryptosporidium



Iodine mount showing egg of Ascaris.

#### 4. Discussion

In developing countries like India IPIs is still important public health problem associated with risk factors like poverty, illiteracy, poor sanitation, lack of access to potable drinking water and warm climatic conditions. In our study prevalence of IPIs is 56.40% which is high and pose important public health problem in people residing in this area. Similar findings were reported in Jayalakhshi. S *et al.* <sup>[1]</sup> (77%) and kumar H *et al.* <sup>[9]</sup> (49.38 %). While in contrast to this Studies by Singh R *et al.* <sup>[10]</sup> (6.68%) and kumar A *et al.* <sup>[6]</sup> (9.91) shows low prevalence. The prevalence of different intestinal parasites varies from one country to another and depends upon environmental, social and economic factors such as poverty, malnutrition, personal and community hygiene, population density, unavailability of drinking water, poor sanitary facilities and hot and humid tropical climate <sup>[11]</sup>. Prevalence of IPIs was found more in females 54.60% (77/141) than males 45.39% (64/141), this can be explained as women in this area are also engaged in handling livestock and field work too. So comparatively they are more exposed to contaminated soil and water which is major predisposing factor. Similar findings were reported by Manochitra. K *et al.* <sup>[4]</sup> and omar H *et al.* <sup>[5]</sup>

In our study most common age group affected is 30-45 years which can be attributed to more individuals involved in field work so more prone to exposure to contaminated soil, food and water. Similar findings were reported Manochitra K *et al.* <sup>[4]</sup> and Singh.G *et al.* <sup>[12]</sup> In present study more cases were reported in warm climate April to September. This can be explained as warm season is more favorable for multiplication of parasite and transmission of infection. Similar findings were reported in Pawar. S *et al.* <sup>[13]</sup> In our study we found single parasitic infection (67.37%) was more common in stool compared to mixed infection (32.63%), which is in contrast with findings seen in study by Omar H *et al.* <sup>[5]</sup> In our study most common parasites identified were *Cryptosporidium parvum* and *Cyclospora cayetanensis* mixed infection in 31.92%, followed by *E.*

*histolytica* 28.36%, *Cryptosporidium parvum* 19.86%, *Giardia lamblia* 14.18%. *Cyclospora cayetanensis* 3.55%, *Taenia spp* and *E. histolytica* & *Gairdia lamblia* mixed infections were 0.71% respectively. Similar findings were reported in study by Pawar S *et al.* <sup>[13]</sup> In our studies protozoal infections was more common compared to helminthic infection. similar findings were reported in other studies by Aher A *et al.* <sup>[14]</sup> and Misra S *et al.* <sup>[15]</sup> In contrast to this Kumar H *et al.* <sup>[9]</sup> observe in their study that helminthic infections was more common compared to protozoal infections.

#### 5. Conclusion

Prevalence of IPI was found higher in our study, so we report our findings significant. As IPIs is important public health problem it is necessary to develop effective preventive and control strategies like health education and environmental hygiene. Since most of the intestinal parasites are transmitted by the feco-oral route, provision of safe water supply and latrines as well as improvement of sanitation play a crucial role to control and reduce intestinal parasite infections in the area.

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