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Incidence of Intestinal Parasitic Infection with Special Focus of Protozoal Infection in a Tertiary Care Hospital

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A B S T R A C T

Intestinal parasitic infections (IPI's) are commonest cause of diarrhoeas globally endemic and have been described as constituting the greatest single worldwide cause of illness and disease. We aimed to study prevalence of intestinal parasitic infections in a tertiary care hospital. Total 1012 stool samples were included in present study, out of which (8.2%) were positive either for Protozoal or Helminthic infections. Protozoan infection was found to be more common than helminthic infection. *Giardia duodenalis* infection was commonest in protozoal infection constituting (59.8%), followed by *Entamoeba histolytica* (42.69%). *Hymenolepis nana*and *Strongyloides stercoralis* were seen in 3 cases each..*Cytoisospora belli* was seen in one sample. The study revealed the widespread distribution of intestinal parasites among symptomatic and asymptomatic patients from various age groups. The reduced prevalence of soil transmitted nematode infections due to effects of anti-helminthics and the relative higher prevalence of protozoal infection (Giardiasis) as expected have been explicitly demonstrated in this study.

Introduction

Gastrointestinal infections are the most common cause of diarrhoea worldwide and the leading cause of death in childhood in the developing world. The etiology of these infections is varied and can be viral, bacterial, parasitic and fungal agents. Intestinal parasitic infections (IPI's) are commonest cause of diarrhoeas globally endemic and have been described as constituting the greatest single worldwide cause of illness and disease.(1)(2)Parasitic infections are linked to poor sanitation, lack of safe and potable water and improper hygiene. The frequency of parasitic infections varies with age and sex of general population. Intestinal parasitic infections are more common in children and leads to nutritional deficiency, anemia, growth retardation and impaired learning ability (1)(3). The purpose of this study was undertaken to know the prevalence of intestinal parasitic infections soil-transmitted helminths (STHs) such as *Ascaris lumbricoides*, *Trichuris trichiura* and hookworms, the most common intestinal parasites. *Ascaris lumbricoides* is the largest and the most common helminth parasitizing the human intestine and currently infects about 1 billion people worldwide.(3) *Hymenolepis nana* is the most common parasitic cestode prevalent globally.(4) *Giardia duodenalis/ Giardia intestinalis*, previously known as *Giardia lamblia*, causing giardiasis, is the most prevalent protozoan parasite worldwide with about 200 million people being currently infected.(5) Another common intestinal protozoan is *Blastocystis hominis* whose parasitic status is under debate.(3).

About one third of the world, more than two billion people, are infected with intestinal parasites.(6) Intestinal parasitic infections are rarely a cause death but because of the size of the problem, the global number of related deaths is substantial.(7) About 39 million disability adjusted life years (DALYs) are attributed to IPIs and these infectious thus represent a substantial economic burden.(8) We aimed to study prevalence of intestinal parasitic infections in our region.

Materials and Methods

This study is an observational cross sectional study. Stool samples received in our laboratory from both out patients and inpatients treated at the hospital, all age group and both sexes, were included in this study. As this was not a prevalence based study, we considered only those cases that were referred by the clinicians to the laboratory for stool examination. Majority of these patients presented with chief complaints of bloating, pain abdomen, indigestion, skin irritation, weakness and passage of mucous in stool. Samples were collected in wide mouthed containers provided by the Department of Microbiology containing no preservative and were transported to the laboratory within 2-3 hours of collection. The stool samples were examined within 1-2 hours of collection. Stool samples were examined grossly for color, consistency, presence or absence of blood, mucus and worms. Routine stool microscopic examination of saline and iodine preparation was done for red blood cells, pus cells, trophozoites and cysts of protozoa and ova of helminthes. Parasites were identified under low and high power of microscope. Modified acid fast stain was done to visualize oocysts of coccidian parasites. The percentage of the parasites was calculated to find out prevalence of parasitic infections and data were analysed for interpretation.

Results and Discussion

Total 1012 stool samples were included in present study, out of which (8.2%) were positive either for Protozoal or Helminthic infections. Protozoan infection was found to be more common than helminthic infection. *Giardia duodenalis* infection was commonest in protozoal infection constituting (59.8%), followed by *Entamoeba histolytica* (42.69%). *Hymenolepis nana* and *Strongyloides stercoralis* (Fig. 2) were seen in 3 cases each. *Cytoisospora belli* (Fig. 3) was seen in one sample (Fig. 1).

Figure.1 Distribution of parasitic infections

Figure.2 Larvae of *S. stercoralis*

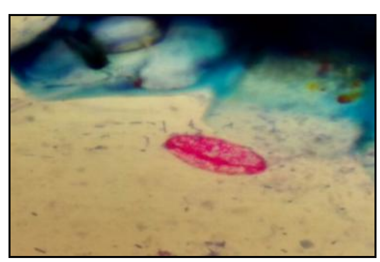

Figure.3 Oocysts of *C. belli*

This study showed wide spectrum of IPIs prevalent in this part of the country. The worldwide endemicity of IPIs has added to the global health burden, often crippling about 450 million people, mostly children and women in reproductive age group.(9) Though, poor socioeconomic and unhygienic conditions have been largely implicated for this global burden, their ubiquity has been demonstrated not only in studies from rural and slum areas but also from urban areas.(10)Rapid industrialization and mass movement of population from rural to urban areas has made situations worse, thus facilitating the rapid spread of IPI. (11)

In this study, we found a prevalence of 6.6% of IPIs in our locality, which is comparably low against studies reported elsewhere. While prevalence of 38%, 51.5% and 31.5% has been reported from rural areas of Ghaziabad(12), Karnataka (10) and Pauri Garhwal (11) respectively by survey of target population, prevalence of 12.5% and 15.19% has been reported from urban slum areas of Chandigarh (13) and central `Gujarat (14) respectively. Likewise, prevalence of IPIs in Nepal and Sri Lanka has been reported as 29.4% and 34.56% respectively. In context to our finding, low prevalence of 13.4% has been reported in a study from our vicinity.(15).

*Giardia duodenalis*was the most common protozoan isolated. The prevalence of Giardiasis is 3-7% in developed countries, it is as high as 20-30% in developing countries(16). Giardiasis can present with a spectrum of signs and symptoms which are mostly self-limiting. In context to school children, the extra intestinal and long term consequences of Giardiasis is of recent interest and are equally alarming. (17)Ocular complications, arthritis, skin allergies, myopathy can occur in affected children besides the well-established complications like failure to thrive, stunting and growth retardation, cognitive disorders and chronic fatigue. All these factors are of immense public health importance owing to the high occurrence of Giardiasis in young children.

Entamoeba sp. was the most prevalent parasite in this study. It could not be commented whether the cysts of *Entamoeba* sp. were from pathogenic variety (*E.histolytica*) or non-pathogenic variety (*E.dispar/moshkovskii*). Motile trophozoites were alsoobserved in 15% of the stool samples positive for *Entamoeba* sp.

Another important aspect revealed in this study should be discussed. STHs account for 27% of entire school-age and preschool-age children population worldwide.(18) Consequently in 2001 the World Health Assembly resolved to control them by mass scale drug administration especially in less developed countries.(17) WHO recommended MDA to all residents of endemic areas with frequency once or twice a year based on the prevalence (18). The widespread administration of anti-helminthic drugs have already shown striking reduction in STHs burden in some parts of India. This is in concurrence with the finidings of our study where the prevalence of these infections was very low.

In conclusion, the study revealed the widespread distribution of intestinal parasites among symptomatic and asymptomatic patients from various age groups. The reduced prevalence of soil transmitted nematode infections due to effects of anti-helminthics and the relative higher prevalence of protozoal infection (Giardiasis) as expected have been explicitly demonstrated in this study. Widespread cleanliness campaigns, awareness among the low socioeconomic population and continued mass deworming will definitely have an impact in reducing the prevalence of IPIs in the near future.

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