



PARASITIC AGENTS CAUSING IPI IN A RURAL TEACHING HOSPITAL

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ABSTRACT

Background: Intestinal parasitic infections are a significant problem in developing countries like India. Lack of knowledge of prevalence of parasites in a particular geographical area may lead to misdiagnosis of IPI's as appendicitis, and other inflammatory bowel diseases.

Materials & methods: Stool samples were collected and each sample was examined by macroscopic and microscopic examination. Modified Zn stain was performed on samples collected from immunocompromised patients.

Results : 11.3% of the samples were positive for parasitic infections. Entamoeba histolytica was the predominant isolate followed by Ancylostoma duodenale.

Conclusion : There is increased prevalence of infection with Soil transmitted helminthes (STH). Periodic treatment of at-risk people and health and hygiene education would reduce transmission of STH. Amoebiasis is still the most common type of parasitosis in India.

KEYWORDS : Intestinal parasitic infections, Soil transmitted helminthes, Entamoeba histolytica

Introduction

Intestinal parasitic infections [IPI] in humans remain a significant threat to healthy living in developing countries [1] It is estimated that around 2 billion people are infected with Intestinal parasites globally. [2] It is a serious public health problem in most of the regions of the world, especially in developing countries, and represents a major cause of morbidity and mortality in children and among high-risk groups. The prevalence of these infections 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, low literacy rate and hot and humid tropical climate [3].

The most common parasite causing infections globally are Ascaris lumbricoides, hookworm, Trichuris trichiura and Entamoeba histolytica. Most of these are transmitted through soil, their route of transmission being faecally contaminated fingers or sometimes migrate through skin to intestine. Poor sanitation, scarcity of potable drinking water and substandard personal hygiene practices may contribute to the rapid spread of such infections.[4]

The prevalence of intestinal parasitic infections varies with different geographical regions. Environmental factors also play a role in the incidence of IPI. [5,6] Though age is not a factor, children are observed to be most affected by parasitic infestation. Micro and macronutrient deficiency, low birth weight, underweight can predispose to frequent IPI's in children.[7] Parasitic infestation in pregnant and reproductive age population can be responsible for intrauterine growth retardation. IPI's can be responsible for nausea, vomiting, diarrhea, malabsorption, malaise, fatigue, depression, weight loss, fever, gastrointestinal obstruction, hypoproteinemia, wasting, pica, hypersensitivity reactions, urticaria and edema in IPI.[8] Complications of intestinal parasitic infections include intestinal ulceration, intestinal obstruction, intussusceptions, abscesses, peritonitis and reactive arthritis or asymptomatic synovitis usually involving lower extremities. Parasite specific manifestations are seen in case of Ancylostoma duodenale and is responsible for microcytic hypochromic anaemia. [9] Giardiasis can be responsible for severe malabsorption syndrome and Entamoeba histolytica infection if not treated can be responsible for intestinal and extra intestinal manifestations including amoeboma, toxic megacolon, pneumatosis coli, peritonitis and liver abscess.[10]. Lack of knowledge of prevalence of parasites in a particular geographical area may lead to misdiagnosis of IPI's as appendicitis, and other inflammatory bowel diseases.[11]

Diagnosis plays an important role in IPI's. Stool examination for parasitic ova, cysts, trophozoite and larvae remains the gold standard for the laboratory diagnosis for IPI's. Though serological tests including ELISA for the detection of antigen in stool, as well as antibody in blood/serum are available, their usefulness has been found

to be limited except in case of extra intestinal manifestations. Usefulness of PCR in the diagnosis of parasitic infections is limited due to cost affordability in low income countries.[12]

In India, the overall prevalence rate of parasitic infections ranges from 12.5% to 66% with the prevalence rate for individual parasite varying from region to region.[13] Thus, the present study was conducted to know the prevalence of intestinal parasitic infection in the patient population in our hospital area.

Materials and Methods:

The study was undertaken in central laboratory of Medici institute of medical sciences, R.R district, Telangana, India.

A total of 150 stool samples were collected from patients of all age groups. Stool samples were collected in wide mouth containers without preservatives. Each stool specimen was examined by macroscopic examination, microscopic examination and modified Zn stain. The colour, consistency of stool specimens and the presence of blood and mucus in the sample were noted. The specimens were also examined for the presence of segments of Taenia, adult Hookworm, round worm with the naked eye. Then direct microscopic examination of the sample by using saline and iodine preparations was done. On a microscopic slide, a small amount of stool sample was emulsified in 1-2 drops of saline and iodine solution. A cover slip was placed on it by taking care that the preparation was free of air bubbles and macroscopic debris. Parasites were identified under low and high power of microscope. Modified Zn stain was performed only in immunocompromised patients to identify the intestinal coccidial parasites. Smears were prepared from stool specimens, alkaline fushin was poured on the slides and heated intermittently for 5 minutes, slides then washed with water. Decolorization was performed with 2.5% sulphuric acid for 1 minute and then counter stained with 1% methylene blue for 1 min, then washed and air dried and examined with 100X objective for the presence of oocysts. The percentage of the parasites was calculated to find out prevalence of parasitic infections and the data was analyzed for interpretation.

Results:

Out of 150 stool samples processed, 17(11.3%) were positive for parasitic infections. Protozoal cysts were found in 7(4.2%) while helminthic eggs were found in 10(58.8%) of positive samples.

Entamoeba histolytica infection was the commonest infection in protozoal infections constituting 5(71.4%) of the protozoal infections followed by Giardia lamblia 1(14.3%) & Cryptosporidium 1(14.3%). Ancylostoma duodenale 4(40%) was the predominant organism in helminthic infections followed by Ascaris lumbricoides 3(30%), Hymenolepis nana 1(10%), Trichuris trichiura 1(10%), and Enterobius vermicularis 1(10%)

The highest prevalence of parasitic infestation was found in age group 11 to 20 yrs (20.8%) and lowest in age group 31 to 60 yrs (0%). 9(52.9%) males and 8(47.1%) females showed positivity for ova and cysts. Prevalence of parasitic infection was nearly equal in male and female.

Table 1 : Intestinal parasites in stool specimens

Name of the parasite	n (%)
Protozoans	7[41.2%]
E. histolytica	5 [29.4%]
G. lamblia	1[5.9%]
C.parvum	1[5.9%]
Helminths	10[58.8%]
A. duodenale	4[23.5%]
A. lumbricoides	3[17.6%]
E. vermicularis	1[5.9%]
H. nana	1[5.9%]
T.trichura	1[5.9%]

Discussion:

Though the prevalence of parasitic infection is low in our study (11.3%) but the prevalence of Soil transmitted helminthes (STH) infection (47%) has increased in our area. The prevalence of hookworm infestation is now decreasing in our country compared to that in the 1980's. Manochitra et al study in 2016 revealed 8.7% STH compared to study by Parija et al in 1987 whose study revealed 10.5% STH. [14,15]. But in our study, there is an increased prevalence of STH in our area. The strategy for control of soil-transmitted helminth infections should be to control morbidity through the periodic treatment of at-risk people. People at risk are preschool children, school-age children, women of childbearing age including pregnant women in the second and third trimesters and breastfeeding women. This will reduce the morbidity by reducing the worm burden. In addition, health and hygiene education reduces transmission and reinfection by encouraging healthy behaviours.

Among the STH, A. duodenale is the most common parasitic infection in India, which was also seen in our study. A. duodenale contributed to 23.5 % of our isolates. Mild infections with A. duodenale produce diarrhoea and abdominal pain. Severe infections can create serious health problems for newborns, children, pregnant women, and malnourished adults. In fact it is the leading cause of anaemia and protein deficiency in developing nations. Unlike other STHs, in which school-age children are most affected, high-intensity hookworm infections are more frequent in adults, specifically women. The disease causes severe adverse effects in both the mother and infant, such as low birth weight, impaired milk production, and increased risk of mortality.[16]

The most common parasite in our study was Entamoeba histolytica (29.4%) followed by Ancylostoma duodenale (23.5%), Ascaris lumbricoides (17.6%), Giardia lamblia (5.9%), Cryptosporidium (5.9%), Hymenolepis nana (5.9%), Enterobius vermicularis (5.9%) and Trichuris trichura (1%). In the studies of Parameshwarappa et al. and Bisht et al also Entamoeba histolytica as the most common parasite [17,18]. A study by Srihari et al showed E. histolytica was the common parasite followed by Cryptosporidium and Giardia [19]. Another study by Kang et al. revealed that the commonest parasite identified was hookworm followed by Giardia and Cryptosporidium [20]. Prevalence of different ova/cyst differs from area to area. But in many studies and in our study, E. histolytica was the most common intestinal parasite proving that Amoebiasis is the most common type of parasitosis in India. But our study revealed low prevalence of Entamoeba when compared to previous studies. (17,18) This suggests that there is good sanitary practice, filtration of water supplies and sewage disposal in our area.

Our study revealed a low prevalence of overall intestinal parasitic infections. Our prevalence reports are unlike other reports from different authors like Hegde G R et al (90.62%), Patel J C (75%) and Prakash Tondon (38.1%) which showed high prevalence. [21,22,23]. This suggests that there is increased awareness and improvement of sanitary practices, personal hygiene, safe drinking water supply, patients early treatment seeking behavior and health education in our hospital area.

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