Analysis of Intestinal Parasitic Infections in a Tertiary Care Hospital of Ahmadabad

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Abstract: Background & Objectives: Microscopic evidence of Intestinal parasitic infections (IPIs) becomes evident only when the parasites are heavily populated in the intestine. Immunological tests can diagnose IPIs even at earlier stage of a disease but the tests are costly, not easily available and lots of research is yet to be done in that field. So even today we have to rely upon microscopic evidence only & microscopically detected infections may be a tip of iceberg only. The purpose of this study was to determine the distribution of Intestinal parasitic infections in patients attending a tertiary care hospital. **Material and Methods:** A total of 847 stool sampleswere examined macroscopically & microscopically for the presence of parasite eggs, larva, cysts and trophozoites. **Results**: Out of 847 stool samples, parasites were detected from 72 (8.5%) samples. The distribution of intestinal parasites was as follows: Entamoeba histolytica (44%), Giardia intestinalis (30%), Trichomonas intestinalis (10%), Ascaris lumbricoides (6%), Hymenolepis nana (4%), Strongyloides stercoralis (2%), Ancylostoma duodenale (2%), and Isospora belli (1%). **Conclusion**: It is concluded that protozoal infections are more common in our region than helminthic infections. Constant surveillance of the infected patients, their treatment as well as improving sanitary condition will help to prevent the spread of IPIs.[Dhamecha M NJIRM 2015; 6(1):17-20]

Key Words: Entamoeba histolytica, Giardia intestinalis, Intestinal parasites

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Introduction: About 50% of urban and 68% of rural population in India is affected by Intestinal parasitic infections (IPIs).[1] Poverty, illiteracy, poor hygiene, lack of access to potable water, and a hot and humid tropical climate are some of the common factors attributed to IPIs. [2]

Protozoal diseases are less easily treated than bacterial infections because many antiprotozoal drugs are toxic to the human host.[3] Moreover, it has been observed in many studies that protozoa use various drug resistance mechanisms similar to bacteria for their survival.[4] Amoebiasis is caused by the intestinal protozoal parasite E. histolytica & is the third leading parasitic cause of death in humans after malaria and schistosomiasis. Globally, it is responsible for 40000–100000 deaths a year. [5] Giardia intestinalis is the most prevalent protozoal parasite worldwide with about 200 million people being currently infected. [6]

Parasitic causes of diarrhoea are common in paediatric patients and lead to nutritional deficiency, anaemia, growth retardation and impaired learning ability. Therefore, diagnosis should be pursued vigorously in the appropriate clinical settings. Stool analysis is a first line laboratory test used for screening of parasites in cases of diarrhoea and other gastrointestinal disorders. [7, 8]

Very few studies have been conducted on IPIs in our region so this study can provide the most recent baseline data for the control of parasitic infections in future. The purpose of this study was to investigate the frequency of different types of IPIs, their correlation with age & to analyse seasonal impact on IPIs in patients attending a tertiary care hospital in Ahmedabad, Gujarat.

Material and Methods: The study was carried out in the Microbiology department of a tertiary care hospital in Ahmadabad, Gujarat. A total of 847 stool samples from indoor as well as outdoor patients, presented with complaint of diarrhoea or gastrointestinal infections of suspected parasitic aetiology from March 2011 to April 2012 were analysed. The stool samples were collected in a labelled, wide mouthed, clean, dry, screw- capped container without preservatives and immediately (less than 2 hrs.) examined after collection. Stool samples were subjected to macroscopic examination, to check the colour, consistency and presence of blood, mucus, or adult helminthic parasites. In the laboratory, slides were prepared directly for wet mount in saline & iodine and then

were examined microscopically for presence of protozoan trophozoites and cysts, worm eggs and larvae, and oocysts. Finally the samples were concentrated by formal-ether sedimentation technique and examined microscopically to detect light parasitic infections. Modified Ziehl-Neelsen (ZN) staining technique was used to identify oocysts of coccidian parasites.

Results & Discussion: Intestinal Parasitic Infections are barometer of health hygiene of investigated geographical area. More is the number of infections, poorer the level of sanitation & personal hygiene. Current study showed 8.5% (72/847) rate of IPIs which is significantly lower than the previous studies carried out by Kaur *et al.*& Marothi *et al*. & parallel to the studies of Champa *et al.*& Nitin *et al*. in India. [9, 21, 12, & 22] In comparison to the developed countries the rate in this study is still higher. [2, 8, 13] Lower IPIs rate in current study might be due to active involvement of AUDA and municipality in development of public toilets under "Nirmal Bharat Abhiyan". Moreover Municipality supplies purified water in the city including our study area.

A total of 81 different parasites were detected from 72 samples. Single parasite was detected from 64 samples, two parasites from7 samples & three parasites from 1 sample. Distribution of eight different species of parasites is shown in Graph 1.

The commonest parasite detected in this study was E. histolytica (44%, 36/81) which is in agreement to the findings of other studies. [7, 10, 11] Cysts of E. histolytica were detected from 15 samples, trophozoites from 7 & both trophozoites as well as cysts were detected from14 samples. The second most common parasite detected in this study was G. intestinalis (30%, 24/81), comparable with the findings of previous studies.[10, 11, 14] Cysts of G. intestinalis were detected from 16 samples, trophozoitesfrom5 samples & both trophozoites as well as cysts from 3 samples. The possible reason for high occurrence of these two protozoal infections in this study is the infective stage of these protozoa, the cysts, which can be considered as the main source of infection. The cysts are excreted continuously in the stool of asymptomatic carriers in the community who are responsible for high endemic rates of these infections. [2, 15]

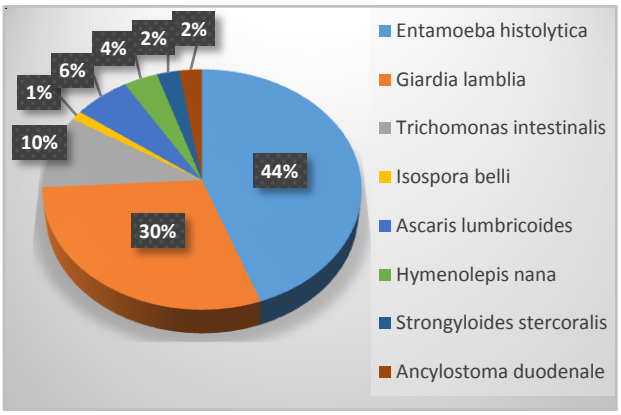
Infection with E. histolytica & G. intestinalis occurred almost throughout the year, which indicates endemic nature of both the parasites in our region. The peak incidences of both the parasites were noted from June to September month (Graph 2), when the climate is humid due to monsoon. [16] This is because in humid climate E. histolytica& Giardia cysts may remain viable for weeks or months outside the body& can transmit the infection. [15, 17]

The occurrence of helminthic infections (15%, 12/81) in present study was very low in comparison to the protozoal infections (85%, 69/81). In contrast to our study some studies have shown high prevalence of helminthic infections.[1] A. lumbricoides (6%, 5/81) was the most frequent intestinal helminth. Occurrence of hook worm infection in present study was very low (2%, 2/81) because most of the patients were from urban slum area where the people use footwear regularly, thus minimizing the chances for contact with larvae (infective stage) of hook worm.[1]

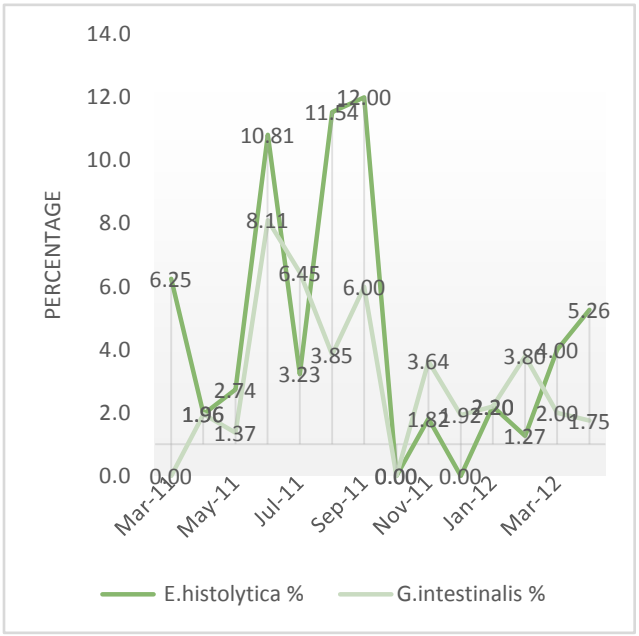
Multiple parasitic infections were detected in 11.11% (8/72) of samples. Existence of two different parasites in the same sample was observed commonly with E. histolytica & G. intestinalis. This might be due to their same route of transmission. The transmission of these parasites occurs via faeco-oral route, either directly from person-to-person or indirectly by eating or drinking faecally contaminated food and water.[2]

Overall, highest positivity was encountered in the age groups between 5 to 9 years (12.86%, 9/70) followed by 10 to 19 years (11.76%, 16/136) [Graph 3]. As they come in contact with contaminated water, food, faeces and other source of infection through play and other unhygienic behaviour. This finding is in agreement with the findings of previous studies.[18, 19, &20] The age group of >50 years was infected to a lesser extent, accounting for only 4.17% (5/120) cases. IPIs were noted higher in females (11.39%, 50/439) than in males (7.60%, 31/408).

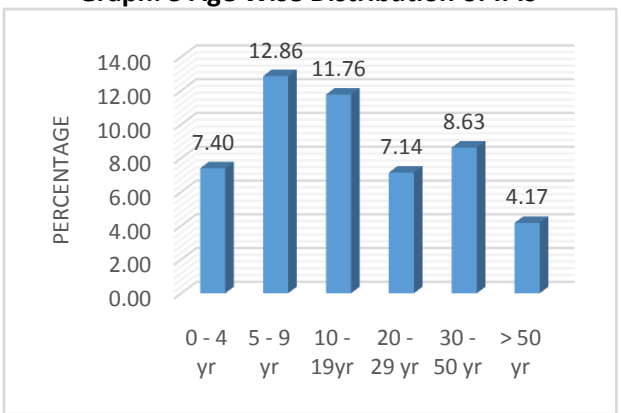
Graph 1: Distribution of Different Intestinal Parasites



Graph: 2 Month Wise Distribution of Protozoal Infections



Graph: 3 Age Wise Distribution of IPIs



Conclusion: Despite the lower Intestinal parasitic infection rate as compared to other studies in India, current study's rate is still higher than the rates of international studies, this suggest that we are yet to achieve still lower infection rate, which is better health hygiene barometer. The study showed high occurrence of protozoal infections with E. histolytica and G. Intestinalis, being the most predominant parasites. School going children were the most affected age group in this study. The finding that increased incidence of Intestinal parasitic infections in late summer & throughout monsoon is due to the fact that in vitro stage (cyst) of their life is favoured by environmental changes.

There should be high index of suspicion of clinicians and microbiologists, especially during the monsoon seasons, which may prevent the third common cause of parasite related death in our tropical country. As this study period was before the era of "Swachh Bharat Abhiyan", we can expect still better results in coming years. To combat with vitamin A deficiency, IAP suggested 6 monthly supplement of Vitamin A in school going children. One may not surprise if government will introduce a policy of 6 monthly antiparasitic prophylaxis along with routine vaccination and Vitamin A supplementation.

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