



PREVALENCE OF INTESTINAL PARASITIC INFECTION AT A TERTIARY CARE HOSPITAL AJMER- A RETROSPECTIVE STUDY

Medical Microbiology

Pushpanjali Verma Senior Demonstrator, J. L. N. Medical college Ajmer, Rajasthan

Renu Khangarot* PG Student, J. L. N. Medical college Ajmer, Rajasthan *Corresponding Author

Govind Prasad Meena

Senior Demonstrator, Dr S. N. Medical college Jodhpur, Rajasthan

ABSTRACT

Intestinal parasitic infections (IPIs) are leading causes of morbidity in the developing world. It is estimated that about 3.5 billion people worldwide are affected. Amoebiasis, ascariasis, hookworm infection and trichuriasis are among the most common infections in the world. According to the WHO, worldwide more than 1.5 billion people are infected with soil transmitted helminthic infections.^[7] Analysis of 5171 stool samples of clinically suspected patients was carried out for IPIs. The records were collected from microbiology laboratory for a period of four years (January 2013 to December 2016). Samples were examined by both macroscopically and microscopically using wet mount and iodine mount as per standard parasitological techniques. The overall prevalence of intestinal parasites was 2.67%. Ten different types of parasites were identified, out of which 78.99% were protozoa and 21.01% were helminths. The most common parasites among protozoa was *Giardia lamblia* (40.37%) followed by *Tricomonas vaginalis* (36.70%) and *Entamoeba histolytica* (14.68%). *Tricomonas vaginalis* was observed though it is not known to cause any gastrointestinal disorder, it may be due to improper sample collection while among helminths the most common parasite was *Taenia* species (41.38%) followed by *Ascaris Lumbricoides* (34.48%) and *Enterobius vermicularis* (17.24%). The infection was more common in males (52.55%). The most common age group affected was 21-40 years. Since parasitic infestations are endemic, it is necessary to identify and rectify risk factors, developing effective prevention and control strategies including health education, environmental hygiene, sanitation and creating awareness about prophylactic anti-protozoal medications are needed to prevent community spreads. Periodic deworming programmes should be implemented successfully in the community.

KEYWORDS

Intestinal parasite; protozoa; *Giardia* and environmental hygiene.

INTRODUCTION

Intestinal parasitic infections (IPIs) are important public health problem worldwide, with high prevalence in developing countries like India^[2]. It is estimated that about 3.5 billion people in the world are infected, among them 450 million fall ill. ^[3,4] Amoebiasis, ascariasis, hookworm infection and trichuriasis are among the most common infections in the world and according to the WHO, more than 1.5 billion people are infected with soil transmitted helminthic (STH) infections worldwide.^[7]

Parasite infection is a leading cause of non-bacterial gastroenteritis, malnutrition, anemia, haematuria, abdominal distension and sometimes mental disorders. The primary mode of infection is through fecal-oral route with an incubation phase of one to two days.

Risk factors associated are low socioeconomic status, illiteracy, poor sanitary and environmental hygiene conditions, tropical hot humid climate, urbanization, industrialisation and lack of awareness^[5]. These factors directly contribute to the variation in the prevalence of infection in different states of India.

Prevalence of IPIs in different states ranges from 5.56% to 90%.^[14,15] Several studies have been undertaken in different parts of India, but there are only a few studies reported from Rajasthan.^[10,11,12,13]

Therefore, this hospital-based retrospective study was undertaken to estimate the prevalence rates of IPIs among clinically suspected patients and to assess the risk factors associated with these infections in Ajmer area of Rajasthan.

MATERIALS AND METHODS

This study was carried out in the Department of Microbiology J.L.N. Hospital Ajmer (Rajasthan) for a period of four years (January 2013 to December 2016). A total of 5171 patients with clinical suspicion of parasitic infection were included in this study. After proper instructions, the patients were provided wide mouthed, sterile screw capped, clean, dry, properly labelled plastic container for collection of stool samples. The stool samples were examined within 1-2 hours of collection. Each stool sample was subjected to macroscopic and microscopic examination.

Macroscopic examination:

Sample was examined macroscopically to look for colour, consistency, presence of mucus, blood and presence of parasitic structures such as

proglottids, scolices, adult tapeworm, pinworm, roundworm or hook worm.

Microscopic Examination:

The samples were examined microscopically for ova, cysts and trophozoites using saline and iodine mount. Unstained saline wet mount preparation was done for the detection of intestinal protozoa trophozoites and helminthic egg or larvae motility. Iodine mount allows the examination features of the protozoa and the identification of cyst. Confirmed identification of the parasite was done after 3 consecutive sample reporting.

However in those cases which were negative by direct wet mount preparation method but had strong clinical suspicion of intestinal parasitism, the concentration technique was performed by saturated salt solution method and formal-ether method.^[9]

RESULTS

The prevalence of parasitic infection was found to be 2.65%. There were ten different parasites encounter. Out of which 78.99% were protozoa and 21.01% were helminths. The most common parasites among protozoa was *Giardia lamblia* 40.37% followed by *Tricomonas vaginalis* 36.70% (due to improper sample collection) and *Entamoeba histolytica* 14.68% [Fig.1] while among helminths the most common parasite was *Taenia* species 41.38% followed by *Ascaris lumbricoides* (34.48%) and *Enterobius vermicularis* (17.24%) [Fig.2]. Most of the cases were reported during summers i.e., April to September with the infection more common in males 52.55%. The most common age group affected was 21-40 years [Table 1].

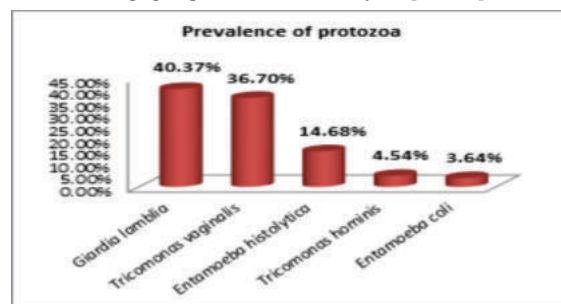


Figure 1: Prevalence of protozoa in stool samples

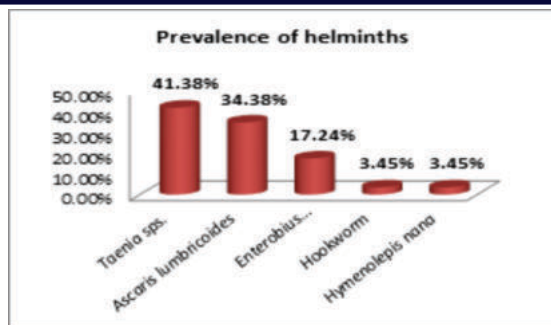


Figure 2: Prevalence of helminths in stool samples

Table.1 Demographic data showing prevalence of parasitic infection (M=male, F=female)

Age group	2013		2014		2015		2016		Total
	M	F	M	F	M	F	M	F	
0-20	3	2	1	2	14	8	2	4	36(26.27%)
21-40	5	4	4	4	9	20	5	9	60(43.79%)
41-60	6	3	6	0	5	3	7	2	32(23.35%)
61-80	1	0	0	1	4	2	1	0	9(6.56%)
Total	15	9	11	7	32	33	15	15	137

DISCUSSION

In developing countries worldwide IPIs pose challenge to public health infrastructure, most individuals involved in field work are prone to exposure. Tropical climate of India is also more favorable for multiplication of parasite and transmission of infection.

The overall prevalence of parasitic infection in our study was found to be 2.67% while other studies reported the prevalence rate ranges from 25 to 70%, which depends largely on the diagnostic methods employed, number of stool examinations done per patient, environmental, social, economic factors, variation in geographical distribution of different parasites, effective health education and public health services in the study area.^[11,12,13,14]

In present study protozoa were found to be more common than helminths (33.33%) similar to the Tinaude et al., Banerjee S. et al., and Bisht D. et al.^[20,21]. Among Protozoa, *Giardia lamblia* is the most common parasite which was also the case with Sindhur P.K. et al. and Zemene T. et al.^[22,23]

Most of the cases were reported during summers i.e., April to September with the infection more common in males 52.55%. This difference has been attributed to increased exposure to certain parasites in males because of occupation with hormonal and immunological mechanisms such as the immunomodulatory effects of testosterone in males which increases their susceptibility to certain parasitic infections.^[18] Females generally exhibit higher levels of immune responses as compared to males.^[19]

The limitations of this study include the lack of clinical correlation and complete testing on all samples. The effect of antiparasitic treatment on the estimation of parasitic infections was also not taken into account as the information was not available. The prevalence of other parasites were low in our study as no modified Ziehl-Neelsen's staining method was performed for the detection of oocytes of *Cryptosporidium parvum* or *Isospora belli* etc., which is an important pathogen incriminated or immunocompromised cases.

CONCLUSION

The most common isolate was *Giardia lamblia* among protozoa and *Taenia* species among helminths with the prevalence of 2.67%. Larger sample size and more surveillance studies will help to establish effective measures and evidence-based approaches to curb the parasitic proliferation in our region.

Immediate focus must be given to health education, awareness about properly washing hands and covering water sources and environmental hygiene. Microscopy is highly helpful, low-tech and low-cost solutions for diagnosing IPIs from stool samples. Albendazole and mebendazole are given for both prophylaxis and to treat IPIs.^[24]

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