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PREVALENCE OF INTESTINAL PARASITIC INFECTION AND ASSOCIATED RISK FACTORS- A STUDY IN A TERTIARY CARE CENTRE IN NORTH BIHAR

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ABSTRACT **Background:** Intestinal parasitic infections remain prevalent and constitute a public health problem in certain rural areas of North Bihar. This study is aimed at evaluating the prevalence, intensity, and risk factors for intestinal parasitic infection to design community awareness and health education campaigns for the target population. **Methods:** This cross-sectional study was conducted between January to April 2020 among patients attending the OPD of DMCH with complaints of abdominal pain and diarrhoea. Patients for the study were selected using a simple random sampling method. Socio-demographic variables and risk factors were collected by a structured questionnaire. Stool specimens were collected and processed using direct wet mount and formol-ether concentration techniques to determine the presence of parasites. **Results:** A total of 137 patients were enrolled. The overall prevalence of intestinal helminths was 10.3%. The prevalence of hookworm, Strongyloides stercoralis, and Trichuris trichiura were 8.0%, 0.9%, and 0.3%, respectively. The prevalence was lower for protozoan infection than for helminth infection. Blastocystis hominis accounted for the highest percentage of intestinal protozoan infections 3.0%, followed by Giardia intestinalis 0.8%. **Conclusions:** This study is to describe the prevalence of intestinal parasitic infection from North Bihar. Hookworm infection is more prevalent than other types of STH infection. The development of community awareness campaignsand appropriate control measures should be considered to reduce the prevalence of hookworm infection.

KEYWORDS : Intestinal parasitic infection, Risk factors, North Bihar

INTRODUCTION

The World Health Organization estimates that approximately 1.5 billion people are infected with soil-transmitted helminths worldwide [1].The high prevalence of intestinal parasitic infection is closely associated with poverty, climatic conditions, poor personal hygiene, poor sanitation, and unsafe drinking water [2–5]. Previous studies have given due attention to distributions of intestinal parasites in adults and school-age children [2, 6, 7].

METHODS

This cross-sectional study was carried out from January to April 2022 in Darbhanga Medical College and Hospital, Darbhanga, Lehriasarai. Simple random sampling method was used to select patients from each sub-districts. We randomly selected 137 patients, then gave instructions and distributed plastic containers for stool collection.

Data Collection and Laboratory Processing

A structured questionnaire was developed and used to collect demographic and socioeconomic data (i.e. age, education level and income). Information on possible risk factors (i.e. personal hygiene behaviors such as hand washing and shoe wearing) was also collected via the questionnaire. All completed questionnaires were checked for accuracy and completeness. After proper instruction, a clean plastic container labelled with the patients's name and identification number was distributed to each participant and one day later they returned containers back with at least 10 g of stool. Each specimen was checked for correct labelling, quantity of sample, and procedure of collection and transported immediately to the parasitology laboratory of DMCH. A portion of each specimen was processed immediately using a direct microscopic technique with a saline and iodine solution to detect cysts, trophozoites, eggs, and larvae of intestinal parasites. The remainder of each specimen was analyzed using the formol-ether concentration technique. Briefly, 1 g of stool sample was suspended in 3 ml of 10% formalin, sieved with cotton gauze, and transferred to a 15-ml conical centrifuge tube. Then, 8 ml of 10% formalin and 3 ml of diethyl ether were added and the resulting solution was centrifuged for 5 min at 2000 rpm. Subsequently, the supernatant was discarded, and the remaining sedimentwas observed under light microscope at 10× and 40× objectives to detect eggs and larvae of helminths, cysts, and trophozoites of protozoan parasites. Iodine solution was used to detect and identify cysts of protozoan parasites.

RESULTS

Socio-demographic characteristics A total of 137 patients, comprising 38 males and 99 females, were enrolled in the study. The mean age of participants was 35 years, with a range of 23 to 71 years. The age-group distribution showed that a majority were in the 31–40- years age group. The overall prevalence of intestinal parasitic infection among participants was 45/137. A majority of the infected participants 97.8% (44/ 45) had a single infection while one participant 2.2% (1/ 45) was found to have a double infection (hookworm and Trichuris trichiura). Among helminth infections, hookworms was the predominate parasite, followed by Strongyloides stercoralis and T. trichiura .No cestodes or trematodes were detected in this study. The prevalence of helminth infection was twice the prevalence of protozoan infection. The highest prevalence was due to Blastocystis hominis and followed by Giardia intestinalis. Male participants had the overall prevalence at 18.4% whereas the infection rate in female participants was slightly lower at 13.3% .The difference in prevalence of intestinal parasites between female and male participants was not statistically significant.

DISCUSSION

This study demonstrates the prevalence of intestinal parasite infection in North Bihar. The overall prevalence of intestinal parasitic infection was lower than the prevalence found in other similar studies. For example, a survey of residents found prevalence of 19.8% [2], and a survey conducted in rural communities found 37% of people had an intestinal parasitic infection [3]. These variations in prevalence may be due to differences in climatic conditions, environmental sanitation, economic and educational status of study subjects, and previous control efforts. In the present study, multiple infections were found in only one subject (2.2% of the sample), which is much lower than the prevalence determined in previous studies in different communities [3, 5]. Differences in the study population, sample size, and methods of analysis could contribute to differences in the detection of various parasites. STHs are a group of parasitic nematode worms causing human infection through contact with eggs or larvae that thrive in the warm and moist soil of tropical and subtropical areas [8].

Globally, an estimated 438.9 million people were infected with hookworm, 819.0 million with Ascaris lumbricoides, and 464.6 million with T trichiura in 2010 [9]. STHs, including hookworms, S. stercoralis, and T. trichiura, weredetected in study participants whereas A. lumbricoides was not. This finding is consistent with a previous study among highland and lowland dwellers in the Gamo area of southern Ethiopia [10]. On the contrary, other studies conducted in peninsular Malaysia reported T. trichiura as the predominant STH in children [11,12]

CONCLUSIONS

This study describe the prevalence of parasitic infections in patients of North Bihar. Hookworm infection was prevalent in the studied communities.

Appropriate measures such as education on personal hygiene and

environmental sanitation and the development of awareness strategies should be implemented to control parasitic infection in the region.

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