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Intestinal Parasitic Infections Among Children and Adolescents with Psychiatric Illness Attending a Tertiary Care Psychiatric Institute of North-East India

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ABSTRACT

Objective: Chronic psychiatric patients are more prone to intestinal parasitic infections (IPIs) due to factors like low self-control, personal hygiene issue, length of hospital stays and low self-care. Intestinal parasitic infections (IPIs) contribute substantially to developing country's childhood morbidity and mortality. The aim of the study was to assess the positivity of IPIs among children and adolescents with psychiatric illness.
Materials and Methods: A cross-sectional study was conducted in a tertiary care psychiatric institute. All the admitted children and adolescent patients that met the inclusion criteria were included. Stool samples were collected and examined by direct wet mount (normal saline and iodine) to detect parasitic cyst and ova. Stool smears were made directly from the specimen and subjected to modified Ziehl-Neelsen staining to detect coccidian parasite. Socio-demographic data like age, sex, geographic distribution was collected in a pre-designed proforma.
Statistical analysis: Analysis and interpretation of the data was done by using IBM SPSS (software version 29.0)
Results: The overall positivity of IPIs in this study was 10% (5/50). Blastocystis hominis was the most commonly detected parasite in 8% (4/5) of patients followed by Ascaris lumbricoides in 2% (1/5).
Conclusion: The findings of the present study indicate a significant positivity of IPIs in children and adolescents with psychiatric illness. Regular screening, periodic deworming of this population and improvement of their maintenance conditions may be considered to prevent and control of IPIs in this population.

Keywords: Intestinal parasitic infections (IPIs); Psychiatric illness; Northeast India; Protozoa; Helminth

INTRODUCTION

Intestinal parasite infection (IPI) is one of the major public health problems that greatly contribute to the childhood morbidity and disability in low and middle-income countries especially in children under five. Around 58 million protozoal infections are registered every year in

children and mostly from developing countries. In developing countries, IPIs are mostly due to soil-transmitted helminths (STHs) like Ascaris lumbricoides, Trichuris trichiura, and hookworms.[1] Although viruses and bacteria are the main causes of diarrhoea in children, intestinal parasites such as Cryptosporidium spp., Giardia intestinalis and Entamoeba histolytica/dispar group are also well-known etiological agents. Cryptosporidiosis in developing nations is because of the inadequate sanitation practises.[2] Oocyst of Cryptosporidium spp. can survive in the environment for months under suitable conditions. The oocysts are hard and resistant to most of the chemical disinfectants, including chlorination and alum flocculation.[3,4] The World Health Organization (WHO) estimates that more than two billion of the world's population are infected with STH's of those, one billion have Ascaris, 740 million have hookworm and 795 million have whipworm.[5] A study by NH Mohamed[6] from Egypt have showed a total 115 (76.67%) positivity for parasites after the examination urine and stool samples collected from a total 150 patients with mental illness. The most prevalent parasites found were T. trichiura in 56%, A. lumbricoides in 40.6% and A. duodenale in 21.33%. Another study by Kyronseppa H [7] from Finland has showed prevalence of intestinal parasites among admitted patients was 4.2% of which 2.9% were pathogenic parasites. In 2004, Giardia and Cryptosporidium were included in the "Neglected Diseases Initiative" of WHO comprising a heterogeneous group of parasitic, bacterial, and viral diseases mostly occurring in developing countries.[8] IPIs has been recognized as a major problem to spread within institutions for the mentally retarded individuals mainly due to poor personal hygiene and lack of toilet training.[9] There is paucity of data regarding IPIs among children and adolescents with mental health issues in this region. So, this study was aimed to detect IPIs among children and adolescents with mental health issues.

MATERIALS AND METHOD

Present study was a cross-sectional study conducted in the department of Microbiology and Child and Adolescent Psychiatry at a tertiary care psychiatric institute of North-East India. Data was collected over a period of four months after the approval from Institutional Ethics Committee (IEC/2024/01/19). A total 50 stool samples were collected from admitted children and adolescents with psychiatric illness. Stool samples were subjected to wet mount preparation by using saline (0.5%) and lugol's iodine for detection of parasitic structure and modified Ziehl-Neelsen staining for detection of coccidian parasite. Socio-demographic data was collected in a pre-designed proforma.

Inclusion criteria:

- Patients below 18 years of age of any gender after taking consent from parents/legally authorized representative

Exclusion criteria:

- Children/adolescents or their parents/legal guardian who do not want to participate in the study

Procedure of Recruitment: All the admitted patients in the department of child and adolescent psychiatry during the study period were included after taking written informed consent from parents/legally authorized representative. Ascent form was obtained from all the patients of 7-12 and 13 -<18 years of age group.

STATISTICAL ANALYSIS

The interpretation and analysis of the data were done by using IBM SPSS (software version 29.0) and shown in numbers and percentages in charts and table.

RESULTS

During the four months of study period (from March 2024 to June 2024) a total

number of 50 stool samples from 0 - <18 years of age group were collected from children and adolescents with mental illness. A total five (10%) samples were positive for parasitic structure. Blastocystis hominis were detected in four (8%) patients. No coccidian parasite was detected in modified Ziehl-Neelsen staining. Distribution of parasites was shown in Table 1.

Table 1: Distribution of parasites found in the positive samples

Parasite	Number	Percentage (%)
Blastocystis hominis	4	8
Ascaris lumbricoides	1	2
Total	5	10

Most of the samples 60% (30/50) were from male patients. The male and female ratio is 1.5:1. Most of the patients (56%) belong to 13 - <18 years of age group. Age and sex wise distribution of patients were shown in Figure 1.

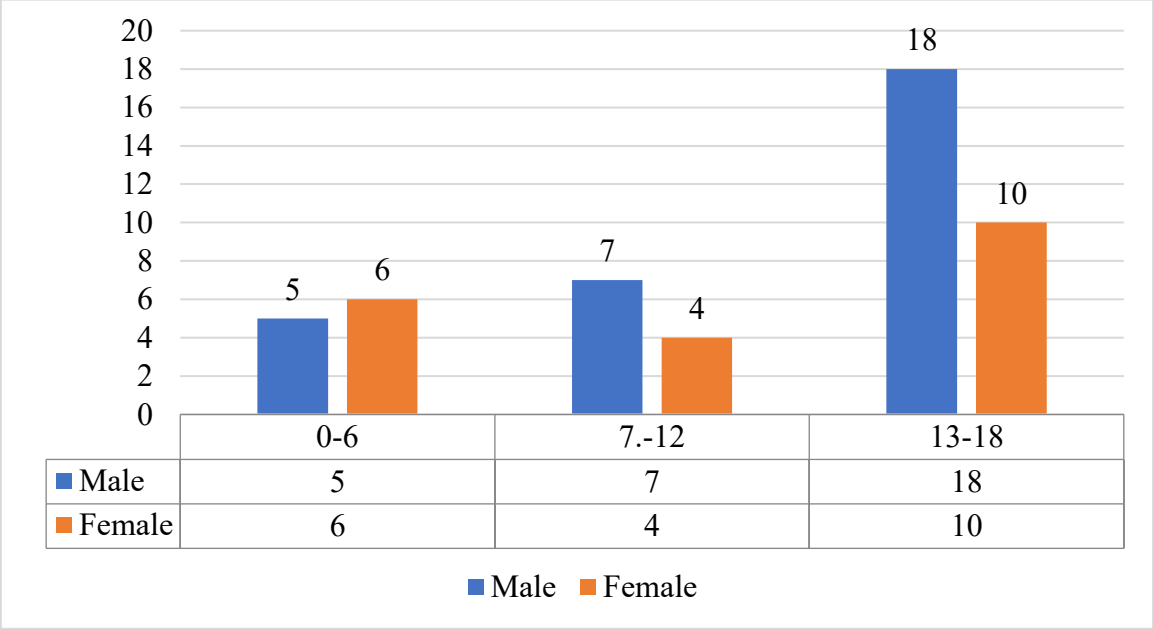

Figure - 1: Distribution of participants based on age and sex.

Most of the patients 46% (23/50) were from Nagaon and Sonitpur district of Assam. Geographical location wise distribution of patients was shown in Figure 2.

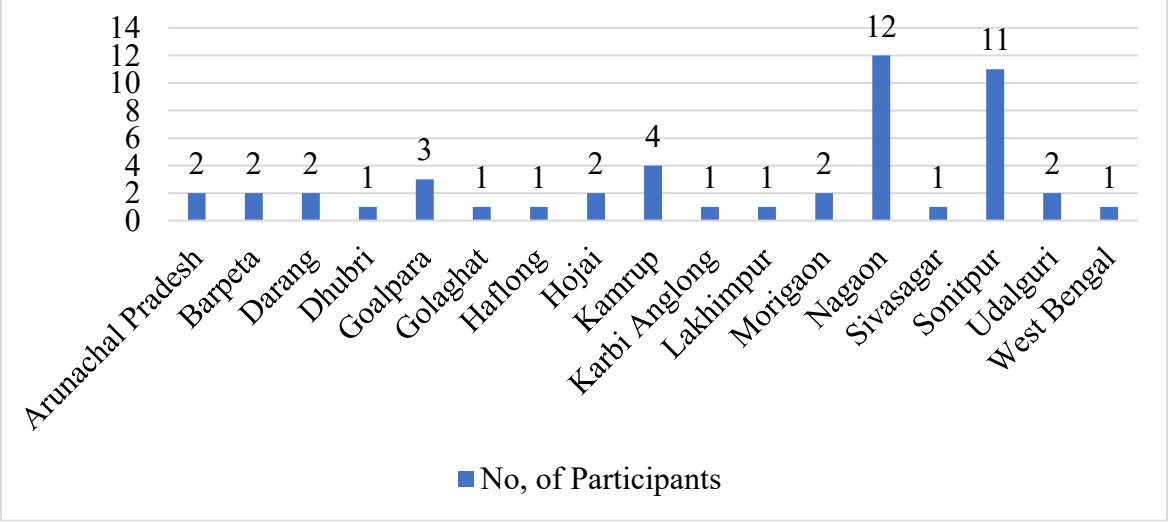

Figure - 2: Distribution of participants based on geographical location

Apart from abdominal discomfort complained by some of the patients no other gastrointestinal symptoms were complained by the patients or their parents. Most of the patients including parasite positive patients were diagnosed with depression or bipolar disorder.

DISCUSSION

As a significant public health hazard, intestinal parasitic infestations are one of the major causes of death among children in low- and middle-income countries.[10] Chronic psychiatric patients are more prone to such infections due to factors like low self-control, personal hygiene issue, length of hospital stay and low self-care.[11] For laboratory diagnosis of intestinal parasitic infections (IPIs), stool microscopic testing for parasitic eggs, cysts, trophozoites and larvae continues to be the gold standard method. The present study identified a total 10% (5/50) positivity for intestinal parasites. The most common parasite detected was Blastocystis hominis (8%), which is a doubtful pathogen,[12] followed by Ascaris lumbricoides (2%). There are very few studies available from all over the world with no studies from India in the literature regarding IPIs in mentally challenged children and adolescents. However various studies on IPIs involving this age group without mental illnesses are available. A recent study from Iran [13] on IPIs among intellectually disabled individuals had showed overall 26.1% positivity for least one type of intestinal parasite which was much higher than the present study. However, study participants were from 4-60 years of age group. Blastocystis hominis (10.1%) was the most prevalent organism in that study also. No helminths were detected in that study. Another old study [14] from the same area on intestinal parasitic infections among intellectual disability children had showed 26.2% positivity for intestinal parasite. Giardia lamblia was the most commonly found protozoan parasite (8.0%) followed by Entamoeba coli (5.5%) and Blastocystis hominis (3.3%) in that study. In another old study [15], a prevalence rate of 7.3% was found among individuals with mental retardation in New York State. A recent study from North-east India had showed high prevalence (47.2%) of IPIs in under-five children with malnutrition with majority of infections due to helminths.[1] However there was no mention about Blastocystis hominis in that study. Another study from Malaysia had found a low IPIs prevalence among urban school going children, suggesting fewer infections in well-resourced areas.[16] World-wide several studies have showed high prevalence of parasitic infection among school going children. Ascaris lumbricoides was detected in one patient only in the present study although it is well known that there is widespread distribution of soil-transmitted helminths in developing regions. It may be due to effective National deworming program and Swachh Bharat Abhiyan initiated by the Government of India. The male and female ratio of study participants in this study was 1.5:1. All of the participants positive for parasite were belonged to 13-18 years of age group with male predominance (n= 4 male, n=1 female). Higher positivity among this particular age group may be due to higher number of participants from that age group (n=28). Presence of intestinal parasites, both protozoa and helminth in children and adolescents with psychiatric illness demands for measures like implementation of regular screening and deworming programs more effectively to reduce the burden of these infections. Additionally, improving sanitation facilities and promoting hygiene education among caregivers and patients can help to reduce the risk of transmission. These measures are essential to protect vulnerable populations like the present study group and improve their overall health and quality of life.

Main limitation of this study was low sample size. This was because the numbers of admitted patients are low in this age group and it is difficult to collect stool sample from OPD patients especially with

psychiatric illness. Stool concentration techniques were not used in this study which could have given a clear picture of the parasite positivity. Only single sample was collected from each patient. Consecutive three to six samples from each patient could have given a different result. However, it is difficult to get stool samples from patients with psychiatric illnesses.

CONCLUSION

The present study highlights 10% positivity rate of intestinal parasites with presence of both protozoa and helminth among children and adolescents with psychiatric illness in this region. Blastocystis hominis was the most common parasite detected. These findings underscore the need for more effective public health interventions targeting vulnerable populations to reduce the burden of parasitic infections. Future research involving larger and more diverse populations is necessary for better understanding of IPI dynamics in populations with psychiatric illness.

Declaration by Authors

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