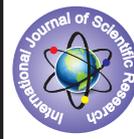


PREVALENCE OF PARASITIC INFESTATION IN STOOL SAMPLES AT TERTIARY CARE HOSPITAL, AHMEDABAD



Microbiology

KEYWORDS: Prevalence, helminths, protozoa, parasitic infection

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ABSTRACT

BACKGROUND & OBJECTIVES: Parasitic infestation account for significant human disease in several developing countries, including India and its diagnosis depends largely on the methods employed and the number of stool examinations done. Therefore, the present study was conducted to get a true idea about the prevalence of intestinal parasites isolated among patients coming to tertiary care hospital, Ahmedabad.

METHODS: A retrospective study was carried out in the Department of Microbiology, Ahmedabad from November 2015 to June 2016. One hundred twelve samples were analysed of patients presenting with symptoms of intestinal parasitic infestations. Each sample was examined by direct wet mount microscopic examination using both normal saline and Lugol's iodine preparation and concentration techniques using salt and formol-ether solutions. Permanent stained smears were performed for intestinal coccidia using modified Ziehl-Neelsen technique.

RESULT: A total of 112 stool samples were examined out of which 22 (19.6%) revealed presence of parasites. *Cryptosporidium sp.*, *E. histolytica/dispar* and *G. intestinalis* were the most common intestinal parasites identified in the current study.

INTERPRETATION & CONCLUSION: Parasitic infections are endemic worldwide and have been described as constituting the greatest single worldwide cause of illness and disease. These present study was conducted to obtain data from hospitals that may be valuable for planning meaningful public control programmes that aim at reducing the prevalence and morbidity due to parasitic infections.

INTRODUCTION

Parasitic infestation by intestinal helminths and protozoan account for significant human disease in several developing countries, including India^[1]. These infections are distributed throughout the World, with high prevalence in low socio-economic communities in the tropic and subtropics^[2]. Most of the people affected are illiterate belonging to low socio-economic class and lack of awareness about importance of sanitation, personal and environmental hygiene with respect to health^[3]. The intestinal parasitic infections are acquired by ingestion, inhalation or penetration of skin by infective forms and its diagnosis depends largely on the diagnostic methods employed and the number of stool examinations done. It is an established fact that intestinal parasitic infections can lead to a number of adverse effects like anaemia, reduced physical growth, mental retardation, abdominal colic, cholestasis, cholecystitis and pancreatitis^[4]. It has been described that correct etiological diagnosis and information generated from inpatients departments of hospital may provide initial information needed to establish better control programs^[5]. Therefore, the present retrospective study was conducted to get a true idea about the species of intestinal parasites isolated and their prevalence among patients coming to tertiary care hospital, Ahmadabad.

MATERIALS AND METHODS

A retrospective study was carried out in the Department of Microbiology, Ahmadabad for a period of eight months (November 2015 to June 2016). One hundred twelve patients

with symptoms suggestive of intestinal infections coming to our tertiary care Hospital for whom stool examination for parasites was advised by clinicians were included in the study and stool samples for bacterial cultures were excluded. The patients were provided wide mouthed clean, dry, properly labeled plastic container for collection of samples and recommend 5 grams of solid or 10ml of liquid stool. The stool samples were examined within 1-2 hours of collection. Macroscopic examination was done to look for structures like proglottids, scolices, adult tapeworm, enterobius, ascaris, trichuris or hookworm.

Direct microscopic examination using normal saline and iodine preparation

About 1-2 mg of stool was emulsified in 1-2 drops of normal saline (0.9%) or Lugol's iodine solution. A cover-slip was then placed and the slide was scanned under 10× and 40× objective lenses of a light microscope. Saline direct smear is used mainly for the detection of intestinal protozoa trophozoites motility. Iodine direct smear allows the examination of the characteristic features of the protozoa and the identification of the *Entamoeba histolytica/dispar* (*E. histolytica/dispar*) cyst from the commensal *Entamoeba coli* (*E. coli*). Parasitological assessment was performed by qualified laboratory technologists.

Formol-ether concentration

After completion of direct stool examination, which were negative by saline preparation method but had strong clinical suspicion of intestinal parasitism, one gram of each sample was emulsified in 10% formalin solution and formol-ether

concentration technique was performed in order to increase the chance of detecting parasites^[6].

Permanent stained smears were performed for intestinal coccidian parasites by the Modified Ziehl-Neelsen's staining method to detect Oocysts of *Cryptosporidium parvum* or *Isoospora belli* in clinically suspected or immunodeficiency cases^[7].

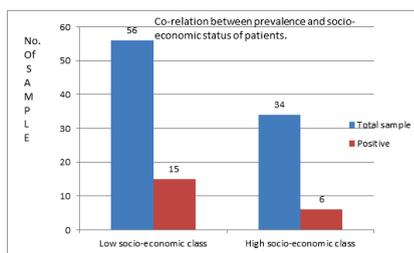
RESULTS

A total of 112 stool samples were examined out of which 22 (19.6%) revealed presence of parasites. Age and gender wise distribution of positive sample showed that female have a higher percentage of infection (22.44%) compared to the male group (14.86%) in both children and adult.

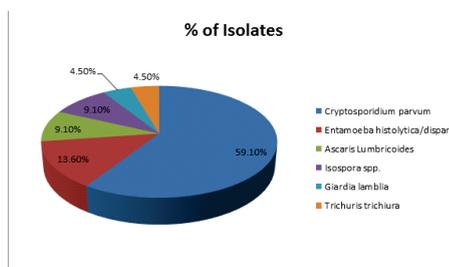
(Table 1).

| | Total | Positive | Percentage |
|----------------------|-------|----------|------------|
| Children(≤ 15 years) | 39 | 5 | 12.8% |
| Adult (> 15 years) | 74 | 17 | 22.9% |
| Male | 74 | 11 | 14.86% |
| Female | 49 | 11 | 22.44% |

Out of 112 patients, 56 patients belong to low socio-economic class and 34 patients belong to high socio-economic class and prevalence of parasitic infestation among them was as shown in figure below



The most common intestinal helminth detected was *Ascaris lumbricoides* (9.1%), followed by *Trichuris trichiura* (4.5%). For intestinal protozoa, the coccidian *Cryptosporidium parvum*(59.1%) was the most predominant protozoa identified from stool of the studied participants followed by *Entamoeba histolytica/dispar*(13.6%), *Isoospora spp.* (9.1%) and *Giardia lamblia* (4.5%).



DISCUSSION

Parasitic infections are endemic worldwide and have been described as constituting the greatest single worldwide cause of illness and disease^[8]. These infections are usually associated with poor sanitary habits, lack of access to safe water and improper hygiene. The degree of each factor and the prevalence of infections vary from one region to the other^[9]. The knowledge of intestinal parasitic infestation extension in a given community is crucial for planning an efficient intervention programs. The present study assessed the prevalence of intestinal parasite infection in patients attending to civil hospital, Ahmadabad. In this study, 19.6% of the diagnosed patients were positive for intestinal parasitic infection. Studies from different part of India have shown different prevalence rates ranging from 6.63% to 46.7%^[10,11]. Prevalence rate in our study was low and is suggestive of better awareness of personal hygiene and environmental

sanitation in the study population^[12]. In addition, this variation may probably be due to difference in time, place method used, personal hygienic habits and socio-economic status. *Cryptosporidium sp.*, *E. histolytica/dispar* and *G. intestinalis* were the most common intestinal parasites identified in the current study that is similar to other studies^[13,14]. *Cryptosporidium* is an apicomplexan intracellular protozoan parasite, known as a significant cause of diarrhoea worldwide especially in children and immune-compromised patients which correlates to our findings as most of our patients from which *cryptosporidium* was isolated belonged to these groups^[15]. This protozoan parasite can be transmitted orally by drinking water and by direct person-to-person contact. Infection with *G.lamblia* and *E.histolytica* may be attributed to poor sewage system in the community, and the faecal contamination of drinking water. While a relatively high prevalence of intestinal protozoa was noticed, a lower intestinal helminth infection rate was observed in the present study. This finding could most likely be explained by the climate of the study area which is known to be relatively dry all over the year. This condition will participate in the desiccation of the eggs of helminthes (infective stage) that become not infective if ingested. Since most of the intestinal parasites are transmitted by the feco-oral route, provision of safe water supply and latrines, improvement of sanitation and health education on personal and environmental hygiene are crucial to control and reduce intestinal parasite infections in the area. Hence, this present study was conducted to obtain data from hospitals that may be valuable for planning meaningful public control programmes that aim at reducing the prevalence and morbidity due to parasitic infections.

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