ORIGINAL ARTICLE

Prevalence of Intestinal Parasitic Infestation at Children Hospital of Lahore

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ABSTRACT

Aim: To find out the frequency of intestinal parasitic infections in children brought to Children Hospital in Lahore.
Methods: A cross sectional survey of 708 children 1-14 years age was conducted at Children Hospital Lahore. Stool smears were examined directly under light microscope for detection of parasites using saline and Lugol's iodine preparations.
Results: Stool test was positive for parasites in 92/708 (12.99%) children. Male to female ratio was 68.5% vs 31.5% .Protozoa were found in 74 cases compared to helminthes in 18 cases. *Giardia lamblia* was the commonest isolate51/74 cases of protozoa (68.9%) followed *by Entameobahistolytica*23/74 cases (32.4%).Among 18 cases of helminthiasis, *Ascaris lumbricoides* was found in 9 cases (50%), *Hymenolepis nana* 5 cases (27.8%), *Trichuristrichuiura* 3 cases (16.7%) and *Ancyclostoma duodenale* in 1 case(5.5%).
Conclusion: *Giardia lamblia*w as the commonest parasite isolated in our series. However, the percentage of intestinal parasites isolates was low on comparing our results with others.
Keywords: Intestinal parasites, helminthiasis, Giardia lamblia

INTRODUCTION

Intestinal parasitic infections ca used by intestinal helminthes and protozoan parasites are among the most prevalent infections in humans and are a major contributor of morbidity. These infestations are globally endemic and almost one fourth (24%) of the world population is infected with intestinal parasite[1,2]. The prevalence varies in different geographical regions but these infections are more common in developing countries. Infectious diseases caused by intestinal protozoa (ameobiasis and giardiasis) or parasitic worms (soil transmitted helminthiasis) have been classified as neglected tropical diseases (NTDs), as they primarily persist in socially and economically deprived communities[3]. The lack of access to clean water, poor sanitation and inadequate hygiene are major contributors to the burden of intestinal parasitic infections[2,3,9,10]. Epidemiological evidence worldwide shows that these infections are very common amongst children and lead to stunted growth and impaired cognitive function. The presence of chronic and heavy intestinal parasitic infection can cause intestinal obstruction, bleeding and associated effects[14].According to the WHO estimates, 870 million children affected by these infection live in the area of high prevalence[4,5,6].India alone contributes nearly 25% to the total global cases with 220.6 million children in need of preventive chemotherapy[7].Various local studies conducted earlier in different parts of the country show that these infections are also quite common in Pakistan especially in younger age group[2,9,10,11,13,14].

Present study was aimed to determine the frequency of different ova, cysts and trophozoites in stool specimens in children coming to Children Hospital Lahore.

MATERIAL AND METHODS

A total of 708 stool samples were collected during July 2012 to December 2012fromchildrenof both genders aged 1-14 years attending Children's Hospital and Institute of Child Health Lahore. Children were examined by trained doctors and specimens were collected from those having suspected symptoms of parasitic infestation (abdominal pain, distention, flatulence, diarrhea, constipation and anorexia, failure to thrive orpica).Specimens were collected both from Out patients and inpatients. Parents were provided with wide mouth plastic containers with a spatula for stool sample collection in younger children. They were asked to collect early morning stool specimens and to deliver the sample to the laboratory within 2 hours of collection. The collected specimens were labeled with a study number and date. The specimens were processed in Microbiology laboratory of the Children's Hospital Lahore. Each specimen was first examined macroscopically for colour, consistency (formed, semi-formed, loose or watery with or without blood), presence of any worm or segments of worms or any other important finding. Samples were analyzed fresh in batches. Microscopic examination of the specimens was done by making saline and Lugol's iodine preparations. The laboratory diagnosis of smear for parasite infestation was based on finding of ova, cysts or trophozoites in smears. Trophozoites and cysts of the protozoa and ova of the helminthes were identified by their characteristic morphological features[12].·Data was analyzed using SPSS software. Descriptive statistics i.e., percentages were used to describe the frequency.

RESULTS

A total of 708 stool specimens of children were processed for ova, cysts and trophozoites. A total of 92 samples were positive for intestinal parasites (Fig 1). Mean age of the study cases was 3-5 years. Among positive cases, males were 63/92 (68.5%) and females 29/92 (31.5%) (Fig 2). Out of 92 positive samples, 71(77.17%) were cysts, 3(3.26%) were trophozoites of different protozoa, and 18(19.57%) ova of helminthes were seen (Fig 3). Cysts of *Giardia lamblia* were present in 48/71(67.6%) and cysts of *Entamoeba histolytica* in 23/71 cases (32.4%) (Fig 4). All

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three trophozoites were of *Giardia lamblia.* Amongst 18 helminth isolates, *Ascarislumbricoides* was seen in 9 cases (50%), *Hymenolepis nana* 5 cases (27.8%), *Trichuristrichuiura* in 3 cases (16.7%) and *Ancyclostoma duodenale* in 1 case (5.5%) (Table1).Amongst92 positive cases, consistency of stool was semisolid in 77 cases (83.7%), loose in 11 cases (11.95%) and solid in 4 cases (4.4%).

Table 1: Frequency of different helminthes (n=18)

Ova	Frequency	%
Ascarislumbricoides	9	50.0
Hymenolepis nana	5	27.8
Trichuristrichura	3	16.7
Ankylostomaduodenale	1	5.5
Total	18	100

Fig 1. Frequency of ova, cysts and trophozoites in stool specimens (n=708, Positive =92)

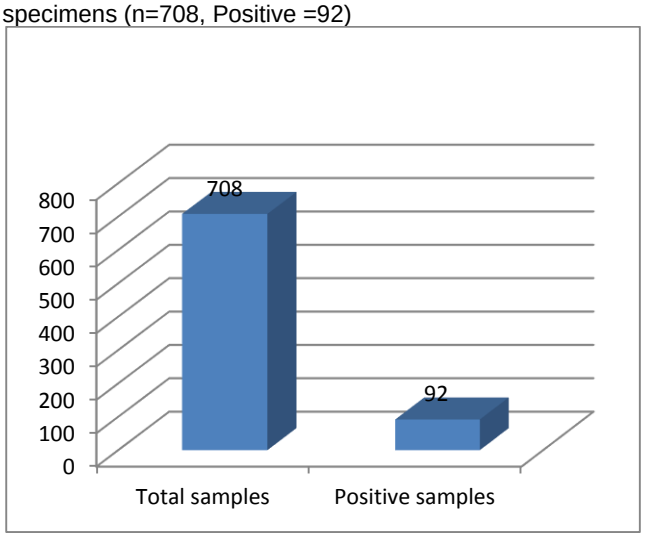

Fig 2: Gender distribution of study cases (n=92)

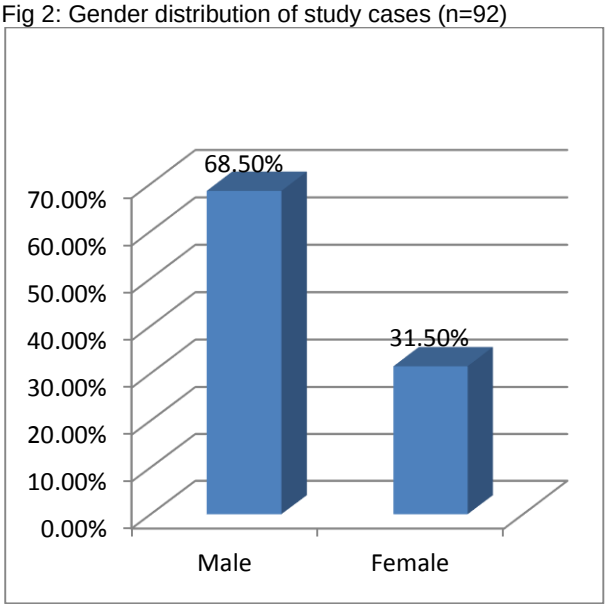

Fig 3: Distribution of Intestinal Parasites (n=92)

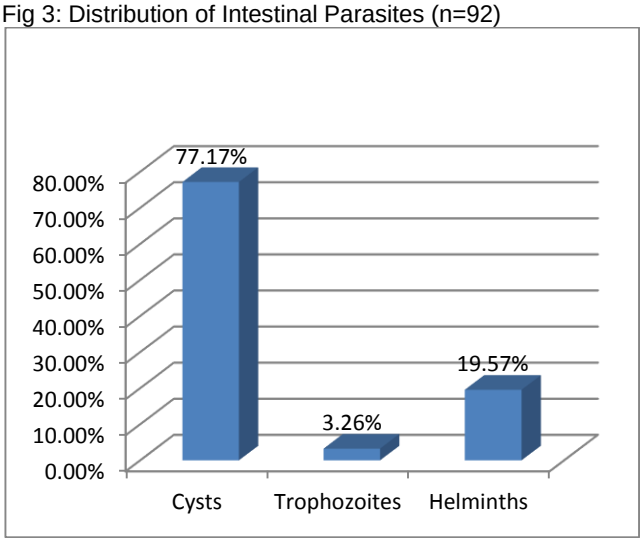

Fig 4: Distribution of cysts in positive cases (n=71)

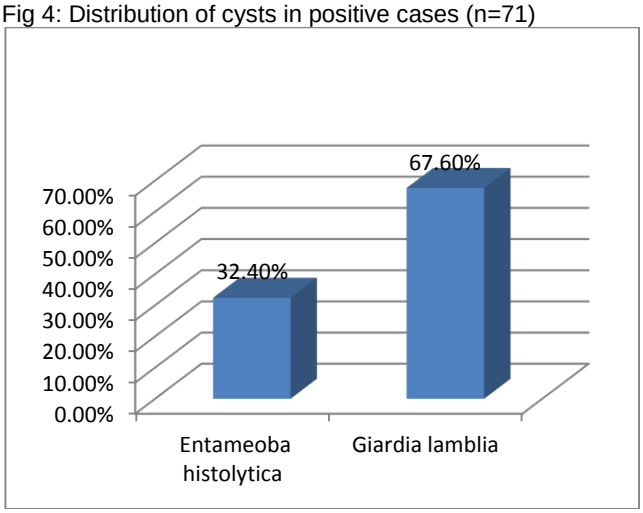

Table 2: Consistency of stool specimens in positive cases (n=92)

Consistency	Frequency	%
Semisolid	77	83.7
Watery	11	11.9
Solid	4	4.4
Total	92	100

DISCUSSION

Out of 708 study cases, 92(12.99%) were positive for ova, cysts and trophozoites. Various studies conducted earlier world over as well as in different parts of our country have shown variable prevalence of intestinal parasites is ranging from 20 -80% amongst preschool and school age children indicating that these infections are quite common in urban, periurban and rural areas of under developed countries[2,3,4,6,9]. Prevalence of intestinal parasitic infestation is associated with multiple variables and factors such as, demographic areas, lower socioeconomic status, lack of maternal education, poor hygiene and poor sanitary facilities[3,8]. Mehraj et al (2008)[2]and Mumtaz et al (2009)[9]have reported a high prevalenceupto52.8%and

68.8% respectively in children under five years of age in periurban and poor communities of Karachi. A comparatively low prevalence in children of urban areas was observed in Vehari (28%)[13], Karachi (20%)[15]and Rawalpindi (17.24%)[16]. Moreover, concentration techniques for isolation of ova of helminthes, or performing stool examination on three consecutive specimens have also been used in some studies showing high prevalence.[2,4,6,9,14] In present study comparatively low prevalence could be attributed to inclusion of majority cases from urban areas with better sanitation facilities and personal hygiene. However study conducted by Ikramullah et al (2009)[14]in Peshawar showed no statistically significant difference between affected children of urban and rural areas. No concentration technique was applied in our study cases which might explain overall low positivity in our cases.

The frequency was substantially higher (68.47%) among male patients in our study. In some other local studies females were found to be more infected than males[9,10,1 7]. Gender bias for male children is very common in our society; however, these infections are considered gender independent globally and no such difference has been reported in other studies[2, 3,6].

In present study protozoa were isolated more as compared to helminthes. Similar findings were reported by Mehmood et al[13]. They reported a prevalence of20.4% protozoa and7.6% of helminthes. Other studies conducted in Karachi and Muzaffrabad in children also reported high prevalence of protozoa[2,9,20]. However many studies conducted exclusively on intestinal helminthes report a very high prevalence of helminthes in both urban and rural children[10,11,14,18].

Overall the *Giardia lamblia*was the most common parasite encountered in our study followed by *Entamoeba histolytica.* These findings are in accordance with somelocal and foreign studies[2,3,9,13]. Finding of Giardia species is an important finding as this common flagellated protozoan has a significant impact on public health. *Giardia lamblia*is characterized by high prevalence among protozon parasites and it frequently causes major outbreaks that are usually associated with contaminated water supplies in developing countries.[20]. It has substantial effects on the growth and cognitive functions of infected children. [21]Ameobiasisis considered as important cause of morbidity and mortality among protozoan parasites worldwide especially in developing countries[18].

Among helminthes, most common isolate was *Ascarisl umbricoides* (50%), followed by *Hymenolepis nana*, *Trichuristrichuiura,* and *Ancyclostoma duodenale*. Infestation by *Ascaris lumbricoides* has been reported as the commonest helminthiasis worldwide. A very high frequency (53.29%) of ascariasis was found by Skindar et al in Karachi[10] ,Ikramullah et al[14] in Peshawar (45.5%) ,Maqsood and Baig[17]in Neelam valley AJK (50.43%) and Wasim et al[11] in KPK (18%). According to WHO, epidemiological surveys and some localstudies[2,9] soil-transmitted helminthic infections are invariably more prevalent in the poorest sections of the populations in endemic areas of developing countries where open field defecation is a very common practice and toilet and hand washing facilities are not available or not practiced.

In our study, stool consistency varied from semisolid, loose or solid. Recovery of ova or parasitic forms depends upon the consistency of the stool sample which suggests the parasitic stage is likely to be present. For example if the stool specimen is soft or loose, it may be more likely to show trophozoite stage. If the stool specimen is formed or semisolid, it may be more likely to contain cystic stage[22.]In in our study only 3 trophozoites were detected in 11 loose stool samples. As majority of stool specimens in our study were having semisolid consistency, finding of cysts of *Giardia lamblia* and *Entameoba histolytica*is in accordance with the stool consistency.

CONCLUSION AND RECOMMENDATIONS

Protozoan parasites were more commonly isolated than helminthes in our study. Cystic forms of *Giardia lamblia* and *Entamoeb ahistolytica* were the commonest isolates followed by *Ascari slumbricoides*. A low prevalence in our study could be explained on urban and periurban referral. Concentration techniques on stool specimens should be used to improve the yield of positive cases.

Sanitary improvements including supply of safe drinking water in urban as well as in rural area should be undertaken on most urgent basis. Toilet facilities and measures for safe disposal of excreta in periurban and rural areas should be provided. Regular hand washing with soap and water should become a habit and taught at the basic and primary school level. Mothers should be educated to wash the hands of toddlers and young children regularly especially before meals. As per WHO recommendations, administration of anti-parasitic and anthelmintic drugs should be done routinely in endemic areas.

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