# Original Research Article
# Frequency of Intestinal Parasitic Infestation among Children from Tertiary Care Center in Rural Sindh.


## Abstract:

**Aims:** To determine the frequency of parasitic infestation among children in our setup.

**Study Design:** Observational study

**Place and Duration of Study:** This study was conducted at the department of Pediatric Medicine and Department of Pathology, Suleman Roshan Medical College and Hospital, Tando Adam, Pakistan from 17th October 2020 to 30th May 2021.

**Methods:** A total of 2412 consecutive patients aged between 5 to 12 years, who attended the outpatient department for the complain of abdominal pain, diarrhea or dysentery, the clinically anemic cases, patients having history of occult blood (black stools) were included in the study. The demographic and clinical details of all the cases were collected on a structured proforma designed for the study. All the patients were investigated for stool examination. The patients already having negative stool report for parasite were excluded from the study. Microscopic examination of the fecal smear in normal saline was performed for the detection of any helminth or protozoal infection. The data collected was statistically analyzed and the results were tabulated.

**Results:** Out of a total of 2412 stool specimens collected and analyzed, 1316 (54.6%) samples were found positive for helminth or protozoal infection, and 1490 parasites were detected. Majority of the children were female 1344 (55.7%). The highest parasitosis (70.3%) was more common among 9-10 years age group. Abdominal pain was the main presenting complaint. The E.histolytica was most common protozoa in both male and female (24.6%), while helminthic infection like ascaris lumbricoides was most common parasite detected in 47.2 % of samples but more prevalent in male cases.

**Conclusion:** The present study reveals a high frequency of parasitosis in our setup. E. histolytica was the commonest protozoa and *Ascaris lumbricoides* was the most frequent helminthic infection, abdominal pain being the main presenting complaint.



**Key Words:** *Entamoeba histolytica, Ascaris lumbricoides.*




## Introduction:

Worm infestation is globally an emergent health concern[1], and is more pronounced in poor population of both rural and urban areas of developing world[2], where high endemicity results from overcrowding of population, poor hygienic conditions, water contamination and insufficiency of drinking water, poor sanitary conditions and migration of people from villages towards the city, and these are common problems in our country resulting in increasing prevalence of parasitic infestation[3,4].

Children are the main victims of these parasitic infections and effected more in comparison to general adult population. Parasite related mortality is rare, but they cause chronic infections and various

nutritional deficiencies resulting in decreased cognitive function, vitamin related disorders, growth retardation and anemia in children, particularly when hook worm infestation is there[5,6].

The soil transmitted helminth (STH) infections are preventable diseases but may cause considerable morbidity and mortality, so now they are listed among Neglected Tropical Diseases (NTDs)[7]. WHO has recommended that in those endemic areas where STH is prevalent over 20 %, the preventive chemotherapy may advised once in a year to all at risk population and twice in a year to those people where prevalence is above 50 %[8].

The surveillance of parasitic infection is very important for intervention strategy[9]. We conducted this study to determine the frequency of parasitic infestation in children in our setup.

## Methods:

The current observational study was conducted at the department of Pediatric Medicine and Department of Pathology, Suleman Roshan Medical College and Hospital, Tando Adam, Pakistan from 17th October 2020 to 30th May 2021, on 2412 consecutive patients aged between 5 to 12 years, who attended the outpatient department for the complain of abdominal pain, diarrhea or dysentery, the clinically anemic cases, patients having history of occult blood (black stools) were also included in the study. The demographic and clinical details of all the cases were collected on a structured proforma designed for the study. All the patients were investigated for stool examination. The patients already having negative stool report for parasite were excluded from the study.

All the patients were asked to give fresh stool sample in a wide mouthed clean, dry plaster container which was provided to each patient after proper labelling. Every sample either from home or laboratory was examined within 30 minutes by microscopic examination of the fecal smear in normal saline and if negative than treated with formal-ether fecal concentration technique and stained with lugol's iodine. The smear was examined for the detection of any helminth or protozoal infection. All the negative cases were re-examined for two more consecutive days and if found negative for any protozoa or helminth than it was labelled as negative. The findings detected were recorded on the proforma. The data collected was statistically analyzed and the results were tabulated.

## Results:

A total of 2412 stool specimens were collected analyzed and 1316 (54.6%) samples were found positive for any helminth or protozoal infection. The children included in this study consists of 1068 (44.3%) male and 1344 (55.7%) female. The majority of cases were detected in 9-10 year age group, and highest parasitosis (70.3%) was also found in this group (Table-1). Pain in abdomen was the main indication detected in majority (56.2%) of cases, followed by diarrhea, dysentery, anemia and presence of occult blood (Table-2).

The stool samples of 1316 (54.6%) cases were found positive out of a total 2412 patients and 1490 parasites were detected from these samples, including 856 parasites in 746 female children and 634 parasites in 570 male children, majority (88.7%) of patient have single infection and double and triple infection was observed in 9.4% and 1.9% of cases respectively (Table 1&3).

Among protozoal infection which slightly more prevalent in female children, the E.histolytica was more common in both male and female (Table-4), in helminthic infection the ascaris lumbricoides was most common parasite detected in 47.2 % of samples, and was more prevalent in male cases (Table-4).

**Table 1. Breakdown of parasite prevalence by age and sex.**

| Age in years | Male | | | Female | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Samples | Positive | % | Total Samples | Positive | % | Total Samples | Positive | % |
| **05–06** | 76 | 14 | 18.4 | 96 | 15 | 15.6 | 172 | 29 | 16.9 |
| **06-07** | 112 | 30 | 26.9 | 146 | 36 | 24.7 | 258 | 66 | 25.6 |
| **07-08** | 186 | 102 | 54.8 | 238 | 123 | 51.7 | 424 | 225 | 53.1 |
| **08-09** | 234 | 146 | 62.4 | 266 | 178 | 66.9 | 500 | 324 | 64.8 |
| **09-10** | 280 | 187 | 66.9 | 289 | 213 | 73.7 | 569 | 400 | 70.3 |
| **10-11** | 96 | 53 | 55.2 | 170 | 104 | 61.2 | 266 | 157 | 59.0 |
| **11-12** | 84 | 38 | 45.2 | 139 | 77 | 55.4 | 223 | 115 | 51.6 |
| **Total** | 1068 | 570 | 53.4 | 1344 | 746 | 55.5 | 2412 | 1316 | 54.6 |

**Table-2: Indications for fecal examination.**

| Indication | Number | Percentage |
|---|---|---|
| **Abdominal Pain** | 1356 | 56.2 |
| **Diarrhea/Dysentery** | 1132 | 46.9 |
| **Anemia** | 437 | 18.1 |
| **Occult Blood** | 64 | 2.7 |

**Table-3. Number of Parasite Isolated in Number of Cases**

| Parasitic Infection | Female No. (%) | | Male No. (%) | | Total No. (%) | |
|---|---|---|---|---|---|---|
| | No of Cases n=746 | No of Parasites Isolated n=856 | No of Cases n=570 | No of Parasites Isolated n=634 | Total No of Cases n=1316 | Total No of Parasites Isolated n=1490 |
| **Single infection** | 652 (87.4) | 652 (76.2) | 515 (90.3) | 515 (81.2) | 1167 (88.7) | 1167 (78.3) |
| **Double infection** | 78 (10.5) | 156 (18.2) | 46 (8.1) | 92 (14.5) | 124 (9.4) | 248 (16.7) |
| **Triple infection** | 16 (2.1) | 48 (5.6) | 9 (1.6) | 27 (4.3) | 25 (1.9) | 75 (5.0) |
| **Over all infection** | 746 | 856 | 570 | 634 | 1316 | 1490 |

**Table-4: Frequency of Parasites Ova/Cysts/ Trophozoite Isolated.**

| Parasite species | | Number of Positive Cases | | |
|---|---|---|---|---|
| | | Cases in Female No. (%) | Cases in Male No. (%) | Total No. (%) |
| Protozoa | *E. histolytica* | 216 (25.2) | 151 (23.8) | 367 (24.6) |
| | *G. lamblia* | 194(22.7) | 133 (21.0) | 327 (21.9) |
| Helminths | *A. lumbricoides* | 389 (45.4) | 314 (49.5) | 703 (47.2) |
| | *H. nana* | 19 (2.2) | 12 (1.9) | 31 (2.1) |
| | *E. vermicularis* | 28 (3.3) | 15 (2.4) | 43 (2.9) |
| | *T. trichiura* | 10 (1.2) | 9 (1.4) | 19 (1.3) |
| Total | | 856 | 634 | 1490 |

## Discussion:

The worm infestation is an eminent public health hazard worldwide particularly in developing countries [1,5]. WHO has estimated that 870 million children are living in highly prevalent areas[10], and about 1.5 billion persons are infected with STH globally[11]. It has been estimated that in Pakistan about 21 million peoples having parasitic infestation in the year 2010[12].

In our study the frequency of worm infestation was 54.6 %. Different studies have been conducted throughout the world revealing different various prevalence ranging from 7.18 % to 90 %[13,14].

The difference of prevalence in these studies may be due to difference in the methodology of the study, personal hygiene of the patient, community educational level, water source, conditions of sanitation, large families and overcrowding of population, level of awareness, and also there are seasonal variation mentioned in the literature[3,4,9,15]. This fact was more evident in studies conducted in Thailand, where a study conducted in southern Thailand show the prevalence of 19.8% while the study conducted in rural areas of northeast Thailand show a prevalence of 37%[16,17]. We conduct the current study in rural areas of Sindh province where all the above mentioned conditions were in favor of parasitosis.

The present study was conducted on children of rural areas aged between 5-12 years. Majority of cases were detected in age group 9-10 years and they also has a high level of parasitosis in comparison to other groups. Similar finding is reported by other researchers, who observe majority of cases in similar group[18]. Regarding patient's symptoms, in our study the abdominal pain was the leading complain found in 56.2 % of study population followed by the symptom of diarrhea and dysentery in 46.9% of cases. These findings are in consistence with the findings of other workers mentioned in the literature[19].

Among protozoal infection, we detect E. histolytica in 24.6 % of samples which was followed by Giardia lamblia in 21.9 % of samples. In tropical and subtropical countries, the E. histolytica usually transmitted by water and food is a common finding in stool which may result in diarrhea and amebic liver

abscess[20]. Some studies show a low (8.2 %) prevalence of E. histolytica[21] and some reported a high (66.5 %) prevalence of E. histolytica[22]. Such a large difference in the prevalence of E. histolytica may be due to difference in the environmental contamination level at different places, improper hand washing habits of the study population, and difference in the contamination of water. These factors contributes in the difference in the prevalence of E. histolytica.

Intestinal worm infestation and STH in particular is seems to be a universal health concern having impact on more than 100 countries. High prevalence of intestinal worm infestation is an indicator of poor living conditions and low standards of sanitation in a society[15]. Present study show a high (47.2%) prevalence of Ascaris lumbricoides, which was the most common worm isolated in our study and was more prevalent in male children, our results were in consistence with various studies indicating that the Ascaris lumbricoides is the commonest helminthic infestation worldwide[15,23,24]. The literature shows a huge difference in the prevalence of ascaris lumbricoides, which is a very low 3.52% to a very high 81%[5,25]. These differences are due to differences in standard of living, improper sanitation and personal hygiene, insufficiency of drinking water, methods of disposal of sewage leading to contamination of soil that increases the prevalence of intestinal helminthiasis.

## Conclusion:

The present study observed a high frequency of parasitosis in our setup of rural area. E. histolytica was the commonest protozoa and Ascaris lumbricoides was the most frequent helminthic infection. Pain in abdomen was the commonest complaint. Female were mainly involved compared to male. Immediate measures should be carried out to improve personal hygiene, quality of water and low standards of sanitation.

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