Original Article

# Frequency and Types of Common Gastrointestinal Parasitic Infestation in Hazara Pediatric Population

Types of Common Gastrointestinal Parasitic Infestation

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## ABSTRACT

**Objective:** To determine the frequency and types of common gastrointestinal infestation in children of Hazara region, presenting with abdominal pain.

**Study Design:** Cross-sectional study

**Place and Duration of Study:** This study was conducted at the Ayub Teaching Hospital Abbottabad from January 2014 to December 2014.

**Materials and Methods:** In this study 273 children with abdominal pain of either gender and age range 5-15 years were included. A stool routine examination was advised and requested from the pathology department of Ayub Medical College Abbottabad.

**Results:** A total of 273(100%) patients were included. Our study shows that 66% children were in age ranged 5-10 years and 34% children were in the age range 11-15 years. Mean age was 10 years with SD ± 3.71. Fifty-eight percent of children were male, and 115(42%) children were females. The incidence of helminth infection in our setup was found in 218(80%) children in which 145(53%) children had Ascaris lumbricoides, 27(10%) children had Hymenolepis nana, 33(12%) children had Trichuris trichhura, 11(4%) children had Enterobious vermicularis, 2(1%) children had Taenia saginata.

**Conclusion:** Our study concluded that the incidence of helminthes infection in our setup was 80% in which the most common helminth was Ascaris lumbricoides 53%, followed by Hymenolepis nana 10% and Trichuris trichhura 12% presenting with abdominal pain.

**Key Words:** Frequency, Helminth Infections, Pediatric Population, Abdominal Pain

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## INTRODUCTION

Helminthic infections are sometimes included in the disease of the poor or the forgotten disease among 17 other prominent diseases with different etiology. These infections are prevalent in poor populations in the developing world. The soil-transmitted helminthic infections are among the seven diseases in the forgotten disease group which have been targeted by the WHO for prophylactic chemotherapy, and they predominantly affect children in the rural areas of many countries across the world[1,2].

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Although they rarely kill, helminths often cause chronic infections and the impact on human health through effects on nutrition leading to growth retardation, vitamin deficiencies, and reduced cognitive function. Hookworm infection is a major cause of iron-deficiency anemia in endemic areas[3].

The threecrucial soil-transmitted helminth infections; hookworm, ascariasis, and trichuriasis are the commonsource of infestation in man. The gastrointestinal tract of children living in a developing country is likely to be parasitized with at least one or in some instances, by all three soil-transmitted helminths, with resultant impairments in physical, intellectual, and cognitive development. The benzimidazole antihelmintics, mebendazole, and albendazole are commonly used to remove these infections. The use of these drugs is not limited to treatment of symptomatic soil-transmitted helminth infections, but also for large-scale prevention of morbidity in children living in endemic areas[4].

Anorexia is one of the most important mechanisms through which gut nematode infections can lower nutritional status. This anorexia and diminished food intake associated with parasitic infections can be extremely important in affecting child growth[5].

The parasitic infestation raises theof morbidity and mortality inthepediatric population oftropical countries. Itsprevalencein children varies in different regions of the world. It isunusually high in poor and developingcountries due to use of contaminated drinking water, inadequate sanitary conditions and poor personal hygiene. The prevalence among pre-school childrenhasalso been documented. This is dominant in rural and urban areasof Pakistan, causing significant morbidity in children[6].

In addition to reducing the incidence or prevalence of disease, improvements in water and sanitation can be expected to affect other aspects of health. When infection rate isdiminished by chemotherapy as the case for some parasitic diseases water and sanitation facility prevented infection rates from increasing again to pretreatment level[7].

Irrespective of the presence of symptoms, the helminthic infection has been associated with the presence of malnutrition, anemia, and susceptibility to developing other infectious diseases. Besides, general malaise, abdominal pain, and weakness are also shared with a soil-transmitted helminthic infection. When present, these infections not only impair intellectual and physical development in the early years of life but also cause a loss of economic productivity in adult life and sometimes result in disability[8,9]. Naturaly, children of an endemic community can be expected to havea parasitic intestinalinfection right after weaning and are prone to re-infection in the rest of life[10]. Presently, literature lack any local studies that havedetermined the prevalence of helminth infection in children with abdominal pain in Abbottabad pediatric population.

This study has been designed to determine the frequency of helminthic infection in children aged 5-15 years who present with abdominal pain to the outpatient department and wards of Pediatrics, and surgical, of Ayub Teaching hospital Abbottabad. This study will allow us to investigate the prevalence of common helminth infections and to assess the gravity of this problem in our community.

# MATERIALS AND METHODS

This cross-sectional study was conducted at the outpatient department of pediatrics, and surgical and respective wards of Ayub Teaching Hospital Abbottabad over a duration of one year. In this study, total sample size was 273 patients were observed by using 77% prevalence of helminthic infections in school going children, 95% confidence interval and 5% absolute precision. Consecutive non-probability sampling technique was used for sample collection. In this study children with abdominal duration pain, either gender and in aged range 5-15 years were included. While Children with abdominal pain due to other diseases,e.g., gastritis, appendicitis, pancreatitis, intestinal obstruction, intussusceptions, children with abdominal due to functional gastrointestinal disorders, children with worm infection and any concomitant abdominal disease were excluded from the study. Itwas conducted after approval from hospital ethical and review board. All patients meeting the inclusion criteria were included in the study. An informed written consent was obtained from parents before enrolling the patients into this study. Children presenting to OPD with a history of abdominal pain were included in the study. A stool R/E were advised and requested from the pathology department of Ayub Medical College Abbottabad. It was performed by a pathologist having a minimum of five years' experience, and the type of helminth infection was noted by the trainee researcher him/herself. All data were analyzed in SPSS version 10. Mean + SD was calculated for continuous variables like age. Frequencies and percentages were calculated for nominal/ordinal variables like gender, helminth infection, and type of helminth present. Stratification was respect to age and gender was done. Post-stratification Chi-square test was applied. $P \leq 0.05$ was taken as significant.

# RESULTS

In this study age distribution among 273 children was analyzed as 180(66%) children were in age ranged 5-10 years while 93(34%) children were in the age range 11-15 years. Mean age was 10 years with SD ± 3.71. Gender distribution among 273 children was analyzed as 158(58%) children were male while 115(42%) children were females. (table no 1).

**Table No. 1: Gender and Age Distribution (n=273) Mean age, 10 years with SD ± 3.71**

| | Categories | Frequency | Percentage |
|---|---|---|---|
| Gender | Male | 158 | 58% |
| | Female | 115 | 42% |
| | Total | 273 | 100% |
| Age | 5-10 years | 180 | 66% |
| | 11-15 years | 93 | 34% |
| | Total | 273 | 100% |

**Table No. 2: Types of helminth,(n=218)**

| Types of Helminth | Frequency | Percentage |
|---|---|---|
| Ascar lumbricoides | 145 | 53% |
| Hymenolepis nana | 27 | 10% |
| Trichuris trichhura | 33 | 12% |
| Enterobious vermicularis | 11 | 4% |
| Taenia saginata | 2 | 1% |
| Total | 218 | 80% |

**Table No. 3: Stratification of helminth infection with age (n=273)**

| Helminth Infection | 5-10 years | 11-15 years | Total | P value |
|---|---|---|---|---|
| Yes | 145 | 73 | 218 | 0.6874 |
| No | 35 | 20 | 55 | |
| Total | 180 | 93 | 273 | |

**Table No. 4: Stratification of helminth infection with gender,(n=273)**

| Helminth infection | Male | Female | Total | P value |
|---|---|---|---|---|
| Yes | 126 | 92 | 218 | 0.9589 |
| No | 32 | 23 | 55 | |
| Total | 158 | 115 | 273 | |

**Table No. 5: Stratification of types of helminth w.r.t age. (n=218)**

| Ascaris lumbricoides | 5-10 years | 11-15 years | Total | P Values |
|---|---|---|---|---|
| Yes | 96 | 49 | 145 | 0.8924 |
| No | 49 | 24 | 73 | |
| Total | 145 | 73 | 218 | |
| Hymenolepis nana | | | | |
| Yes | 18 | 9 | 27 | 0.9857 |
| No | 127 | 64 | 191 | |
| Total | 145 | 73 | 218 | |
| Trichuris trichhura | | | | |
| Yes | 22 | 11 | 33 | 0.9839 |
| No | 123 | 62 | 185 | |
| Total | 145 | 73 | 218 | |
| Enterobious vermicularis | | | | |
| Yes | 7 | 4 | 11 | 0.8356 |
| No | 138 | 69 | 207 | |
| Total | 145 | 73 | 218 | |
| Taenia saginata | | | | |
| Yes | 1 | 1 | 2 | 0.6191 |
| No | 144 | 72 | 216 | |
| Total | 145 | 73 | 218 | |

**Table No. 6. Stratification of Ascaris lumbricoides with gender, (n=218)**

| Ascaris lumbricoides | Male | Female | Total | |
|---|---|---|---|---|
| Yes | 84 | 61 | 145 | 0.9554 |
| No | 42 | 31 | 73 | |
| Total | 126 | 92 | 218 | |
| Hymenolepis nana | | | | |
| Yes | 16 | 11 | 27 | 0.8696 |
| No | 110 | 81 | 191 | |
| Total | 126 | 92 | 218 | |
| Trichuris trichhura | | | | |
| Yes | 19 | 14 | 33 | 0.9776 |
| No | 107 | 78 | 185 | |
| Total | 126 | 92 | 218 | |
| Enterobious vermicularis | | | | |
| Yes | 6 | 5 | 11 | 0.8226 |
| No | 120 | 87 | 207 | |
| Total | 126 | 92 | 218 | |
| Taenia saginata | | | | |
| Yes | 1 | 1 | 2 | 0.8225 |
| No | 125 | 91 | 216 | |
| Total | 126 | 92 | 218 | |

The frequency of helminth infection among 273 children was analyzed as 218(80%) children had helminth infection while 55(20%) children did nothave helminth infection. Type helminth among 218 children was analyzed as 145(53%) children had Ascaris lumbricoides, 27(10%) children had Hymenolepis nana, 33(12%) children had Trichuris trichhura, 11(4%) children had Enterobious vermicularis, 2(1%) children had Taenia saginata.(table no 2)

Younger children with male gender had more prevalent infestation of Ascaris lumbricoides. (table no 3,4, 5, 6). However, P-values of either helminth were not significant.

# DISCUSSION

Helminthic infections are sometimes included in the disease of the poor or the forgotten disease among 17 other prominent diseases with different etiology. These infections are prevalent in poor populations in the developing world. The soil-transmitted helminthic infections are among the seven diseases in the forgotten disease group which have been targeted by the WHO for prophylactic chemotherapy, and they predominantly affect children in the rural areas of many countries across the world[11].

Our study shows that 66% children were in age ranged 5-10 years and 34% children were in the age range 11-15 years. Mean age was 10 years with SD ± 3.71. Fifty-eightpercent of children were male,and 42% children were females. The incidence of helminth infection in our setup was found in 80% children in which 53% children had Ascaris lumbricoides, 10% children had Hymenolepis nana, 12% children had Trichuris trichhura, 4% children had Enterobious vermicularis, 1% children had Taenia saginata.The researchers found that the prevalence of helminthic infection was 77.31% in school going children. They reported that the most common helminth was Ascaris lumbricoides (53.29%) followed by Hymenolepis nana (20%), Trichuris trichhura (10%) and Taenia saginata (0.59%). Another report from Pakistan suggests that while helminthic infections are common in children with ages between 5 and 14 years, they represent about 12% of the total disease burden in the pediatric population. The reported prevalence of helminthic infections in school going children was 66% with a higher prevalence for Ascaris lumbricoldes (45.5%) followed by Hymenolepis nana (8%) Enterobious vermicularis (4%),Hookworms (3.5%), Whipworms (3.5%) and Tapeworms (1.5%)[12]. In one study 30% of food handlers were found to have a parasitic infestation. This is similar to results reported from Sudan on food handlers which showed that 29.4% were harboring intestinal protozoa in stool samples, Giardia lambia in 9.7% and Entamoebahistolytica in 4.3%[13].

The parasitic infestation reported in Afghanistan is 47.2%, Caribbean Island 43.5%. Nepal 66.6%and Bangladesh 53%.The frequency of parasitic infestation was 81% with predominantly Ascaris lumbricoides (48%) in a study from Abbotabad[14].

In a study conducted in Swat, Pakistan, the proportion of different helminthic infestation infecalpositive specimens was; Entamoebae histolytica (4.36%), Trichuris trichura (19.1%), Enterobius vermicularis (8.25%), Ascaris lumbricoides 39.8%, Ancylostoma duodenale (3.64%), Taenia saginata (12.8%), Hymenolepis nana (10.1%), and Giardia species (1.69%)[15]. In a study done in Nigeria showed 49.7% intestinal helminthes with Ascaris lumbricoides, 64.4% hookworm 10.9% and Trichuris trichuriain 1.1% cases. In the same study, 41(23.6%) children with polyparasitism, 33 of them were positive both forhookworm andAscaris lumbricoides[16].

In an endemic area, Ascariasis is the most prevalent parasitic infestation and accounts for 50- 60% of pediatric admissions in the surgical emergency department. Hepatobiliary and pancreatic ascariasis account for about 10% of such admissions[17]. Nishiura et al.studied the northern areas of Pakistan, and concluded with 91%Ascaris lumbricoides[18]. Similarliy in Uganda, 55.9% of children were infected with hookworm,Ascanis lumbricoides or Trichuris trichiura. The incidence of A. lumbricoides was 17.5%, T.trichiura was 7.3% and hookworm 44.5%[19].

in addition to HIV infection,Intestinal helminth infection may be one of the risk factors for the development of active pulmonary TB. This finding may have important implications in the control of TB inendemic helminth areas of the world[20].

# CONCLUSION

Our study concludes that the incidence of helminth infection in our setup was 80% in which the most common helminth was Ascaris lumbricoides 53%, followed by Hymenolepis nana 10% and Trichuris trichhura 12% presenting with abdominal pain.

**Author's Contribution:**

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|---|---|
| Concept & Design of Study: | Hamayun Anwar |
| Drafting: | Irfan Khan, Khalid Khan |
| Data Analysis: | Zahid Irfan Marwat, Anwar Khan Wazir, Muhammad Nadeem |
| Revisiting Critically: | Hamayun Anwar, Irfan Khan, Khalid Khan |
| Final Approval of version: | Hamayun Anwar |

**Conflict of Interest:** The study has no conflict of interest to declare by any author.

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