

## Parasitic infestations in pediatric patients

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### Abstract

**Introduction:** Parasitic infestation is the important cause of morbidity in children. It is regarded as serious public health problem as it may cause anaemia, growth retardation and abdominal symptoms. **Objectives:** 1) To study the occurrence of parasitic infestation in pediatric patients at KVG Medical College, Sullia. 2) To study the age and sex wise distribution of parasitic infestation in above patients. **Material and methods:** After obtaining IEC approval, patients were recruited from department of Pediatrics at KVG Medical College, Sullia. Informed consent from the patients/legal guardian and assent from the child aged over 7 years was obtained. Stool samples were collected and were subjected to saline and iodine mount. **Results:** Out of total 580 samples collected, 112 (19.31%) cases were positive for parasitic infection. 5-10 years age group was most commonly affected (54.46%) and males (67.86%) were more affected as compared to females (32.14%). *Ascaris* was seen in 27.68% cases, *G.lamblia* was seen in 23.21% cases and was most common protozoal parasite. Hookworm was seen in 17.86% cases, *E.histolytica* in 11.61% cases. *S. stercoralis*, *C.parvum* and *Taenia* was seen only in few cases. **Conclusion:** Ascaris, Giardia and hookworms were the predominant intestinal parasites in our study. Proper hygiene should be maintained as they can be transferred through soil.

**Key Words:** Parasitic Infestations, Pediatric, Ascaris, G. Lambliia

### Introduction

Intestinal parasites spend part of their lifecycle in human's digestive tract where they express their parasitic activity [1]. Poor sanitation, personal hygiene, and ingestion of contaminated foods and water are responsible for such infestations [2]. Parasites primarily cause diarrhoea, weight loss, abdominal pain, vomiting and nausea, lack of appetite and abdominal distention [3]. They can also cause iron deficiency anaemia [3]. According to studies, 3.5 billion people are infested by intestinal parasites and about 450 million children are suffering due by parasitic infections [4]. It is estimated that annually, around 65,000 deaths occur due to *Ascaris lumbricoides*, 70,000 because of *Trichuris trichiura* and 60,000 due to hookworms [5]. Pathogenicity is supposed to be multi-factorial. Continuous mucosal injury because of pathogens (*E. coli*, *Shigella*, *Salmonella*, *Campylobacter*), with consequent co-infection and host factors (macro,

micronutrient deficiency and compromised immune system) contributes to higher prevalence of parasitic infestation. According to studies, 1 billion people are affected annually by *Ascaris lumbricoides*, 795 million by *T. trichiura* and 740 million by hookworms [6]. *Ascaris lumbricoides*, hookworm and *Trichuris trichiura* are collectively called as soil-transmitted helminths and are most common intestinal parasites. *Ascaris lumbricoides*, a soil transmitted helminth can cause Loeffler's syndrome, vitamin deficiency and gastro-intestinal symptoms [7]. In *Trichuris trichiura*, infected individuals are asymptomatic, if infection is light. Some people carry many worms, and clinically present with anaemia, abdominal pain, diarrhoea, weight loss, malnutrition, intestinal bleeding, obstruction, appendicitis and perforation [8]. *Giardia lamblia* is the major cause of endemic and epidemic diarrhoea in humans. Poor sanitary conditions, low water quality and overcrowding is associated with it. Such conditions are most favourable in developing countries. Hookworms are associated with iron deficiency anaemia as they cause

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blood loss. *Entamoeba histolytica* is 3<sup>rd</sup> leading reason of parasitic death in the underdeveloped and developing countries and affects almost 10% of world's population [7].

## Material and Methods

**Place of study-** KVG Medical College, Sullia, Karnataka.

**Type of study-** A retrospective observational study from 1<sup>st</sup> January 2015 to 31<sup>st</sup> December 2015.

**Sampling methods-** 1-2 grams of stool sample was collected from pediatric patients (from birth to 15 years of age) presenting with diarrhoea at our institute.

**Inclusion criteria-** Pediatric patients from birth to 15 years

**Exclusion criteria-** children of >15 years age

**Processing of specimen-** All the stool samples were subjected to saline mount and iodine mount and were observed under low and high power magnification.

## Results

Total 580 stool samples were collected during this study. Out of these samples 112 samples were positive for parasitic infection. So, occurrence of parasitic infection in our study is-

**Table-1: Showing occurrence of parasitic infection.**

<b>Total stool samples collected</b>	580
<b>Positive for parasitic infection</b>	112(19.31%)
<b>Negative for parasitic infection</b>	468(80.69%)

According to table 1, around 19.31% were positive for parasitic infestation.

**Table-2: Age distribution amongst positive cases.**

<b>Age group</b>	<b>Number of positive cases</b>	<b>Percentage (%)</b>
<b>Birth- 5 years</b>	21	18.75
<b>5-10 years</b>	61	54.46
<b>10-15 years</b>	30	26.79
<b>Total</b>	112	100

Results show age group of 5-10years account for >50% of cases.

**Table-3: Showing sex distribution amongst cases having parasitic infestation.**

<b>Sex distribution</b>	<b>Total number of positive cases</b>	<b>Percentage (%)</b>
<b>Males</b>	76	67.86
<b>Females</b>	36	32.14
<b>Total</b>	112	100

Results indicates 67.86% cases were males.

**Table-4: Distribution of parasites in positive cases.**

<b>Parasite</b>	<b>Number</b>	<b>Percentage (%)</b>
Ascaris lumbricoides	31	27.68
Giardia lamblia	26	23.21
Hookworm	20	17.86
Entamoeba histolytica	13	11.61
Taenia	8	7.14
Cryptosporidium parvum	7	6.25
Trichuris trichura	6	5.36
Strongyloides stercoralis	1	0.89
<b>Total</b>	112	100

In our study, *Ascaris* was seen in 27.68% cases, *G.lamblia* was seen in 23.21% cases and was most common protozoal parasite. Hookworm was seen in 17.86% cases, *E. histolytica* in 11.61% cases. *S. stercoraris* was seen only in almost 1% of cases.

## Discussion

Approximately 3.5 billion people are infected by intestinal parasites and include around 450 million children. [4]. Studies on human parasitic infections have demonstrated a common relationship with lower socio-economic status of the region [9]. Thus it is particularly high in poor and developing countries due to use of contaminated drinking water, inadequate sanitary conditions and poor personal hygiene. *Ascaris lumbricoides*, *T.trichura*, *Hookworm*, *G.lamblia* are the important intestinal parasites and are responsible for high morbidity and mortality. In children, soil-transmitted helminthiasis is the cause of common health problems. In most instances it is associated with stunting of linear growth, physical weakness and low educational achievement. These is due to their immune systems are not yet fully developed and they also habitually play in faecal contaminated soil.

In our study, out of 580 stool samples collected in 1 year, 112(19.31%) cases were positive for parasitic infestation and 468(80.69%) cases were negative. Studies by Boonchai et al, Adamu et al and Yasmeen et al have shown the prevalence of 22.7%, 27.5% and 34% respectively [6, 10, 11]. The prevalence varies according to geographical area, climate, educational level. As Sullia is rural area, lack of awareness in community, means and support from authorities in maintaining hygiene, might be the reason for this prevalence. In present study, 5-10 years' age group was most commonly affected 61(54.46%) age group, followed by 10-15 years 30(26.79%) and then <5 years 21(18.75%) age. Highest number was found between 5-10 years as this is the school going age group and in this age group children have the habit of pica. Sharing of tiffins, transfer through fomites in the school, more contact with soil while playing may be the other reasons. Sneka P et al showed that in Karnataka highest numbers of cases were found in 5-10 years. [12] S. Panda et al concluded that age of 8 years was the most commonly affected [13].

In our study males (67.86%) were more infected compared to females (32.14%). This may be due to fact that, in rural areas males are more exposed to outside environment compared to females. In few localities girls are not allowed to play outside or even attend schools. This result is supported by a previous study

showing males were more affected as compared to females and this correlates with our study [12]. In our study as per table number 4, *A.lumbricoides* (27.67%) was the commonest parasite followed by *G.lamblia* (23.21%), which was also the case with Yasmeen et al's study at Gaziabad. [6] Miller et al and Jayarani et al, had showed *G.lamblia* as the most common protozoal parasite [14,15].

Parasitic infestations are preventable. Thus, prompt measures should be taken and should include public health education, safe food and water supply, improved sanitation in schools and locality and proper personal hygiene. Proper knowledge of hand hygiene can be very helpful. Other low technology, low-cost solutions include the covering of open water sources, improving food storage and handling. The discharge of untreated household wastewater into the local river or streams and practice of defecation in a open ground or near drinking water sources should be discouraged. Sustainable health, especially for children, is not possible without good environmental sanitation. As far as treatment is concerned, mebendazole and albendazole are the commonly used drugs effective for most parasitic infestations [16]. Early treatment should be initiated in children so as to decrease morbidity.

These drugs can be given prophylactically where more number of cases is found examples in ashrams or schools. Pigs are the reservoirs of many parasitic infections, so wherever outbreaks occur, veterinary evaluation is indicated apart from water and sewage sampling [17]. Areas where hookworms are common, knowledge should be given about wearing of foot wares as the larvae are transmitted through infected soil. HIV patients, if any, should be evaluated specially for protozoal parasites like cryptosporidium, cyclospora and isospora.

## Conclusion

Parasitic infestation are prevalent in developing countries like India. School going males between 5-10 years of age are most commonly infested. *Ascaris lumbricoides*, *Giardia lamblia* and *hookworms* are the most predominant intestinal parasites.

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