

## Prevalence of helminthic infection in adult population presenting in a tertiary care hospital in Islamabad, Pakistan

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**Objective:** To determine the prevalence of worm infections and its various types in patients presenting in a tertiary care hospital in Islamabad, Pakistan

**Methodology:** This cross sectional study was conducted in the Department of Medicine, Shifa International Hospital, Islamabad. A total of 255 adults with suspicion of worm infection above 15 years of age were enrolled in a period of 3 months from August 27, 2016 to November 26, 2016. They were investigated through stool R/E separately on three consecutive days. Patients with a history of antihelminthic drugs in the past 2 months were excluded.

**Results:** Out of 255 patients, 103 (40.7%) were between 15-30 years and 114 (44.7%) between 31-50 years of age. 146 (57.3%) patients were

female. Most of patients (n=149; 58.4%) belonged to urban area. Bore was drinking source in 120 (47.0%) patients. Overall, 131 (51.3%) patients had positive worm infection with *Ascaris* as most frequent (n=81;31.7%) followed by *Taenia species* (n=36;14.1%). Female gender and age between 31 and 50 years was found more prevalent with worm infection. Chashma and well drinking source was found significantly associated with worm infection ( $p<0.05$ ).

**Conclusion:** The prevalence of worm infection is quite high in Pakistani community, with *Ascaris* and *Taenia* spp leading types. (Rawal Med J 201;43:200-204).

**Keywords;** Worm infection, ascaris, taenia, helminthiasis.

### INTRODUCTION

Intestinal helminthic infection also known as worm infection is a common cause of chronic infection in humans in the developing countries.<sup>1</sup> Various types of worms affects the humans; WHO estimates that major intestinal worms which cause disease include Round worm (*Ascaris lumbricoides*), Hook worm (*Ancylostoma duodenale*, *Necator americanus*), Whip worm (*Trichuris trichuria*), Pin worm (*Enterobius vermicularis*), Tape worm (*Taenia saginata*, *Taenia solium*, *Hemanolepis nana*) and Thread worm (*Strongyloides stercoralis*).<sup>2</sup>

There are an estimated 22.1 million disability-adjusted life-years (DALYs) lost for hookworm, 10.5 million due to *Ascaris* and 6.4 million for *Trichuris*.<sup>3</sup> Approximately 100,000 deaths each year occur due to complications of *Ascariasis* and anemia caused by hookworms.<sup>4</sup> Intestinal helminthes are hardly a primary cause of death, however, it effects could result in critical

conditions due to anemia, thus, indirectly attributing to severe morbidity and mortality.<sup>5</sup> The prevalence of helminthic infection is variably quite high in Pakistan and ranges from 23% in children in Islamabad, 21.7% in Bagh District and up to 30% in Quetta.<sup>6</sup> Worm infection is present in people of all ages, irrespective of gender, however, patients in younger age groups have a high infection rate.<sup>7,8</sup> Surprisingly it is still a public health problem in the developing as well as developed countries like United States.<sup>9</sup>

The global aim is elimination of worm related morbidity.<sup>10</sup> Because of high prevalence and serious adverse effects of intestinal parasitic infection in children, many studies have been conducted in various cities of Pakistan.<sup>6,8</sup> In adults, this remains a grey area. The present study is an effort to estimate the frequency of different intestinal helminthic infections in adults presenting in a tertiary care hospital of Islamabad.

## METHODOLOGY

This cross sectional study was conducted at Shifa International Hospital, Islamabad for 3 months from August 27, 2016 to November 26, 2016. The research protocol was approved by Shifa Tameer-e-Millat University's Research Board and a written informed consent was taken from all participants. A total of 255 patients above 15 years of age and of both genders were checked for worm infection. The sample size was calculated by taking  $\alpha = 0.05$  at 95% confidence level, the absolute precision was set at 5%, taken from previous literature the anticipated population proportion was 21%. Patients with a history of antihelminthic drugs in the past 2 months were excluded. Stool routine examination was done for confirmation of helminthic infection. The investigation was conducted thrice on each patient on three separate days continuously. As some parasites are shed intermittently, hence the probability of parasite detection increased from approximately 60% with one sample testing to above 95% when 3 samples were used.<sup>11</sup> Investigations included macroscopic as well as microscopic stool examination and blood counts. Diagnosis of each of worm infection was made on basis of detection of specified eggs on stool microscopy. Eggs of *Taenia saginata* and *Taenia solium* are exactly similar so diagnosis of *taenia species* (spp) was made on basis of specified eggs detected on stool microscopy.

The data were analyzed using SPSS version 17.0. Demographic characteristics, residence and source of drinking water was associated with presence of worm infection were assessed using chi-square test. A  $p < 0.05$  was considered statistically significant.

## RESULTS

A total of 255 subjects were enrolled in this study; 103 (40.7%) and 114 (44.7%) were between 15-30 years and 31-50 years of age, respectively. 146 (57.3%) were female. Majority of study population belonged to urban 149 (58.4%) settings and were living in Punjab province followed by Islamabad and KPK (Table 1).

Of 255 cases, 222 (87.4%) had abdominal pain. Almost one fourth, 66 (26.0%) had history of passing worms in stool. 207 (81.5%) had history of lethargy,

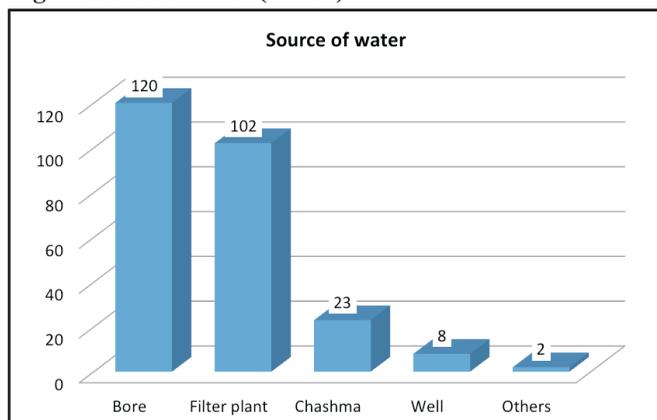
fatigue and numbness whereas 13 (5.1%) used antihelminthic drugs (Table 2). The source of water was Bore in 47.0%, followed by filter plant (40.0%) and Chashma (9.0%) (Fig. 1).

**Table 1. Demographic characteristics and geographical area of patients (n=255).**

	Number	%
<b>Age (years)</b>		
15-30	103	40.7%
31-50	114	44.7%
51 or above	38	14.2%
<b>Gender</b>		
Male	109	42.7%
Female	146	57.3%
<b>Residence</b>		
Urban	149	58.4%
Rural	106	41.6%
<b>Geographical area</b>		
Islamabad	77	30.1%
Punjab	142	55.6%
KPK	30	11.7%
Kashmir	4	1.5%
Balochistan	2	0.7%

**Table 2. Clinical history of study patients (n=255).**

	Number	%
<b>Do you have abdominal pain?</b>		
Yes	222	87.4%
No	33	12.6%
<b>Have you ever passed worms in stool?</b>		
Yes	66	26.0%
No	189	74.0%
<b>Is there a h/o lethargy, fatigue and numbness?</b>		
Yes	207	81.5%
No	48	18.5%
<b>Is there h/o antihelminthic drugs?</b>		
Yes	13	5.1%
No	242	94.9%

**Fig. 1. Source of water (n=255).****Table 3. Worm infestations (n=255).**

	Number	%
<b>Worm infestation</b>		
Positive	131	51.3%
Negative	120	47.0%
<b>Type of worm infestation</b>		
<i>Ascaris</i>	81	31.7%
<i>Taenia spp</i>	36	14.1%
<i>Ascaris + Taenia spp</i>	11	4.3%
<i>D. latum</i>	1	0.4%
<i>H. nana</i>	2	0.8%

**Table 4. Worm infestation according to demographic characteristics and residence of study patients (n = 255).**

	Present (n=135)	Absent (n=120)	P value
<b>Gender</b>			
Male	57 (42.2%)	52 (43.3%)	0.85
Female	78 (57.8%)	68 (56.7%)	
<b>Age (years)</b>			
15-30	55 (40.7%)	47 (39.1%)	0.24
31-50	65 (48.1%)	49 (40.8%)	
51 or above	15 (11.1%)	21 (17.5%)	
<b>Residence</b>			
Urban	76 (56.2%)	73 (60.8%)	0.46
Rural	59 (43.8%)	47 (39.2%)	
<b>Source of drinking water</b>			
Bore	57 (42.2%)	62 (51.6%)	0.05
Filter plant	53 (39.2%)	50 (41.6%)	
Chashma + well	24 (17.7%)	7 (5.8%)	
Others	1 (0.7%)	1 (0.8%)	

Overall, there were 131 (51.3%) patients with positive worm infection. The most prevalent type of worm infection was *Ascaris* (31.7%) followed by *Taenia spp* (14.1%) (Table 3). It was noted that female gender (57.8%) was more likely to have worm infection compared to males (42.2%). Age between 31 and 50 years was found more prevalent (48.1%) with worm infection compared to older age of 51 or above (11.1%), similarly, rural residence (43.8%) was more prevalent with worm infection, however, these differences were not found statistically significant. Bore and filter plant drinking sources were equally likely to have presence or absence of worm infection, however, chashma and Well was found significantly associated (17.7% vs 5.8%) with worm infection ( $p=0.05$ ) (Table 4).

## DISCUSSION

Our study found a high prevalence of helminthic infection (51.3%) in our hospital. The most frequent infection was *Ascaris* followed by *Taenia spp*. A previous local study reported high disease prevalence ranging from 21% in Bagh District, AJK and up to 30% in Quetta.<sup>6,7</sup> Kumar et al from India reported 49.3% prevalence of worm infection.<sup>12</sup> Raghunathan et al from Sri Lanka found worm infection in 34.5% cases.<sup>13</sup> A previous study from Nepal by Shrestha et al witnessed an even higher prevalence of 82.0%.<sup>14</sup> However, contrary to this study, Singh et al witnessed quite low prevalence of 15.1% worm infection.<sup>15</sup> A study from Western India by Shobha et al witnessed helminth infection in 25.1% cases.<sup>11</sup> The above body of evidence regarding prevalence of the disease shows that worm infections vary from area to area and could be dependent on social background and living styles.

In the present study, *Ascaris* was the most frequent helminthic infection followed by *Taenia spp* whereas 4.3% were found to have mixed helminth infection of *Ascaris* and *Taenia spp*. Many previous studies have also found a similar trend. Kumar et al also witnessed *Ascaris* as the main helminthic infection found in 46.8% followed by *taenia* in 2.1% of their study cases.<sup>12</sup> Another study from Kashmir witnessed very high prevalence of *A. lumbricoides*

(69.8%), *T. trichiura* in (31.6%), *Enterobius vermicularis* (16.8%) and *T. saginata* (3.0%) study cases.<sup>16</sup>

In our study, prevalence of *Ascaris* was found in accordance to other studies but prevalence of *Taenia spp* was quite high (14.1%) as compared to other studies where prevalence was found to be 2.1%<sup>12</sup> and 3%.<sup>16</sup> Further larger and multi centered studies should be done to confirm the high prevalence of *Taeniasis* in this area and to ascertain the cause of this high prevalence.

In present study, we noticed that female gender was more likely to have helminth infection and patients of young age 15-50 years were more likely to have greater infection than older patients of 51 or above ages. There was preponderance of urban patients with infections. However, bore and filter plants were less likely whereas people drinking from chashma and Well were more likely to have worm infections. A study from Skardu on children noted that poor hygiene, use of stream water, rural living, and low level of maternal education were the major contributors towards parasitic infection.<sup>8</sup>

In this study three stool tests were conducted for confirmation of the worm infections. In clinical practice, 3 stool samples should give a sensitivity of greater than 75%. However, the costs must be kept in mind and it must be weighed against the probable gain in sensitivity. Many investigators question this approach and recommend that the examination of a single preserved stool specimen in a healthy population, using both direct and formal-ether concentration, was adequate to detect the intestinal parasitic infections.<sup>12,15</sup> Contrary to this, Kang et al demonstrated a much higher prevalence rate of intestinal parasites (97.4%) in a smaller group of subjects from whom a greater number of stool samples was collected. Unlike a community-based survey involving large group of people, it is difficult to conduct more stool tests from a single patient and is only practical in a research setting.<sup>11</sup>

There were few limitations of the study. Data regarding therapy given for helminthic infections and its efficacy and long term follow-up of 3-4 weeks for re-confirmation of helminth could have been more informative and beneficial regarding monitoring of these patients.

## CONCLUSION

The prevalence of helminthic infection was very high in the present study (51.3%). The soil borne infestations *Ascaris* were most frequent followed by *Taenia spp*. Female gender, younger age and urban population were more susceptible to infections whereas chashma and Well drinking source was more likely to have infection than 'bore' and 'filter plant' sources.

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