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EC MICROBIOLOGY
Research Article

Enteroparasites in the People Living in Slum Area of Thapathali, Kathmandu Valley

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Received: September 09, 2016; **Published:** September 30, 2016

Abstract

Background: This study was conducted in order to find out the prevalence of enteroparasites in people living in the slum area of Thapathali, Kathmandu valley, Nepal.

Methods: Total 361 samples collected from slum area were examined for intestinal parasites using normal saline, iodine preparation and concentration method.

Results: Altogether 361 stool samples were collected from slum area of Thapathali Out of total 361 processed sample 87 (24.09%) samples were found to be positive where 195 (54%) were male and 166 (46%) were female. In this parasitological examination 49 (41.17%) female was positive and 38 (24.20%) male was positive. Among the protozoal parasites *Giardia lamblia* was observed in 50 (13.85%) cases and *Entamoeba histolytica* 29 (8.03%) and among the helminths *Ascaris lumbricoides* 4 (1.108%) *Hymenolepsis nana* 2 (0.6%) *Trichuris trichiura* 2 (0.6%). Parasites were mostly found in people in the month of May 20 (30.303%) and was prevalent in the 0-15 age group 30 (27.52%) and was more prevalent among the people using untreated water and illiterate people.

Conclusions: This result suggests that the intestinal parasitosis occurs more in a summer season. This correlates the incapability of the oocyst to survive longer in the environment during the dry season. This could be a very useful tool to correlate the infection with temperature and rainfall. The major contributing factor may be the use of untreated water and vegetables.

Keywords: *Stool; Parasites; Diarrhea; Enteroparasites*

Introduction

Slum (*Sukumbasi*) denotes the people living without land ownership. Thus, they are socio-economically very backward and likely to be infected with intestinal parasites. However, to the best of our knowledge, no such data are available. This study, therefore, was done to see the prevalence of intestinal parasitosis in the people of slum area (settlement without land and ownership) of Thapathali, Kathmandu Valley.

Nepal is a developing nation. The major obstacle in the development of Nepal is illiteracy and poverty. These two factors are also major pre-disposing factors for prevalence of infectious disease in Nepal [1]. Diarrhea is a major cause of childhood mortality and morbidity in Nepal [2]. Since parasitosis is a major emerging pathogenic infection, some measures have to be applied to detect the potential threats and measure to control it. The major groups of intestinal parasites include protozoan's (organisms having only one cell) and parasitic worms (helminths). Intestinal parasitosis, a major public health problem, particularly in the developing countries, affects 3.5 billion people globally. Moreover, *Ascaris lumbricoides*, hookworm and *Trichuris trichiura* infect 1.4 billion, 1.3 billion and 1.0 billion people worldwide, respectively [3]. The high prevalence rate is attributed to lack of education, lack of latrines, occurrence of diarrhea, lower socioeconomic status, inadequate disposal of human excreta and the level of sanitation in households. Parasites can get into the intestine by going through the mouth from uncooked or unwashed food, contaminated water or hands, or by skin contact with larva infected soil [4]. When

the organisms are swallowed, they move into the intestine, where they can reproduce and cause symptoms. Children are particularly susceptible if they are not thoroughly cleaned after coming into contact with infected soil that is present in environments that they may frequently visit. People in developing countries are also at particular risk due to drinking water from sources that may be contaminated with parasites that colonize the gastrointestinal tract [5].

Materials and Methods

In the parasitological study, 361 slum people were included to determine the different parasites. The study was carried out from April 2011 to September 2011.

People of slum area with abdominal pain and symptoms of diarrhea, who has not taken antibiotics, were taken under study.

Samples, with previous antibiotic therapy, were excluded. An inadequate stool sample was also not considered. Patients above 100 years of age were also not taken into consideration.

The stool sample was observed macroscopically for the presence of blood, mucus, and adult or larvae of helminthic parasites. The color and consistency of the stool samples were observed at the same time.

A wet mount is used for viewing the parasites in their original form. For this method, a drop of normal saline was taken in a clean grease free slide and a small amount of stool sample was emulsified using an applicator. The smear was then covered by using a cover slip and then the slide was observed under a microscope. Iodine preparation was performed similarly as wet mount preparation. Iodine was used for staining the iodine makes the nucleus and other parts clear which is helpful for identification of parasites [6].

The stool is concentrated and the smear of concentrated stool is usually examined when direct smear fails to reveal any parasites in the direct smear. The concentration of stool allows the detection of a small number of parasites present in the stool specimens. The concentration procedure allows the increased recovery of egg and larvae of helminths and cyst of protozoa. Commonly used concentration procedure are; floatation techniques and sedimentation techniques.

The microscopic preparation was done to examine the ova and cysts of the parasites. It was also done for detection of red blood cells and pus cells in feces. The detection of oocysts, cysts, trophozoites of protozoa and detection of ova or eggs of helminths was carried out at low power (10X) followed by high power (40X) magnification of microscope by wet mount saline preparation followed by iodine preparation method [7].

The collected data were arranged. The questionnaire was coded before entering into SPSS version 13 for window program. Analysis of data was done using SPSS and WIN PEPI info 2009. Analyzed data were presented using MS Excel and MS word. Data are presented in frequency distribution table percentage and chi-square test.

Result

Samples were collected from slum area of Thapathali, Kathmandu valley. Samples were processed in Pathology Laboratory of B.P Smriti Hospital, Basundhara, and Kathmandu. Parasites were observed using normal saline, iodine, and potassium dichromate preparation. The study was carried out from April 2011 to September 2011. A total of 361 cases were taken into study among them 195 (54%) were male and 166 (46%) were female and as a whole 87 (24.09%) samples were found to be positive.

S. No.	Parasites	Gender		Total p-value
		Male	Female	
1.	*A. lumbricoides*	3	1	4
2.	*E. histolytica*	12	17	29
3.	*G. lamblia*	21	29	50 >0.05
4.	*H. nana*	1	1	2
5.	*T. trichiura*	1	1	2
	Total Parasite	38	49	87
	No Parasite	157	117	274
	Total	195	166	361

Table1: *Gender wise distribution of parasites in diarrheal patients.*

Month	No. of processed samples	Positive		Total	Percentage
		Male	Female		
April	54	7	7	14	25.926%
May	66	9	11	20	30.303%
June	71	9	7	16	22.535%
July	58	5	4	9	15.517%
August	57	6	10	16	28.070%
September	55	2	10	12	21.818%
Total	361	38	49	87	100.00%

Table 2: *Month wise distribution of parasites.*

Parasites	0 to 15 age group	Percentage	15 to 75 age group	Percentage
A. lumbricoides	1	0.917%	3	1.190%
E. histolytica	7	6.422%	22	8.730%
G. lamblia	19	17.431%	31	12.302%
H. nana	2	1.835%	0	0.000%
T. trichiura	1	0.917%	1	0.397%
No Parasite	79	72.477%	195	77.381%
Total	109	100.000%	252	100.000%

Table3: *Age wise distribution of parasites in diarrheal patients.*

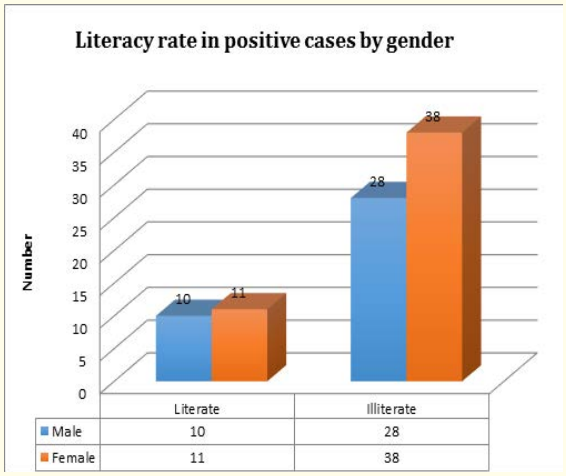

Figure 1: *Distribution of parasites based on education of parent.*

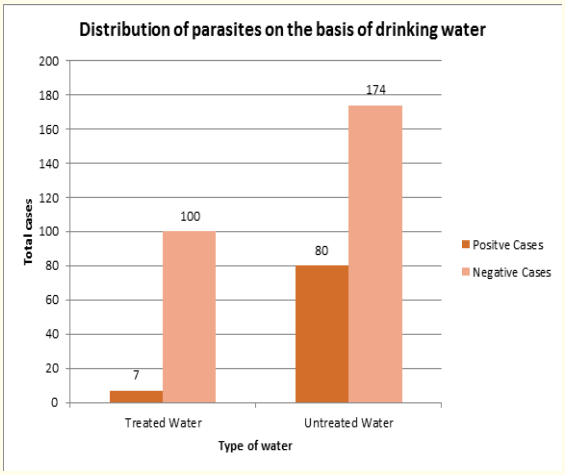

Figure 2: *Distribution of parasites based on drinking water.*

Discussion

The study showed the presence of different enteroparasites among the people of the slum area. The study was completed after the collection of 361samples within six months. Out of the total 361-processed sample, 4 cases were found to be infected with *A. lumbricoid, E. histolytica* was observed as 8% i.e., 29 cases were found to be infected, *G. lamblia* with 50 (13.9%) positive cases were found, *H. nana* with 2 (0.6%) and *T. trichiura* with 2 (0.6%) positive cases were found. Total positive cases were 87 (24.09%). Out of total 361 sample processed 87 sample were found to be positive where the infected male was reported to be 38 and infected female were reported to be 49 and among the age group, (0-15) total of 109 cases 30 (27.52%) cases was found to be positive.

The gender wise distribution of parasites showed that the infection was at the peak of the female (41.17%) than in male (24.20%) [8]. This may be due to the more involvement of female in household work than male. But this result is disagreement with some of the reports from Nepal [9].

The month wise distribution of parasites showed that the infection was in a peak in the month of May (30.30%) followed by April and June. This result suggests that the intestinal parasitosis occurs more in the summer season. Out of the total 361samples, 87 were detected

with parasites. This contributes to about 24.10% of the total processed sample. The results are in accordance with the findings of Chand 2000 (27.94%), Lama 2006 (37.6%), Rai (30.9%). A relatively lower prevalence may be due to the low prevalence of helminths, which may be due to government and organizational campaign against helminths.

This has also been reported by the study in other sides by Connor, 1997 and Sherchand, 1999. The present study showed the occurrence of intestinal parasites in the month of May. This correlates the incapability of the oocyst to survive longer in the environment during the dry season. This could be a very useful tool to correlate the infection with temperature and rainfall.

The age wise distribution of parasites showed that the infection was higher among the age group 0-15, which was reported to be 27.52% i.e., 30 cases out of 109. In the age group of 15-75; 22.62% i.e., 57 cases out of 195. This shows that children more prone to infection than another age group. The result is in accordance with the finding of Ono., *et al*. [10].

On the basis of type of drinking water more parasites were distributed among the people who consume untreated water and fewer parasites were found using chlorinated water. Out of 87 total positive cases, 80 (91.95%) cases were found positive using untreated water and 7 (8.046%) cases were found positive using chlorinated water. Chlorination has been found to be more or less ineffective in the slum area at the bank of Bagmati River due to the high level of contamination with organic matter. Oocyst of some parasites is resistant to chlorination. Oocyst of parasites has also been detected in sewage waters, vegetables, and feces of animals and birds, which may be an additional source of environmental contamination [11].

Higher positive rates (75.86%) were observed in illiterate people than those of literate people. Since this study was focused on the parent, the knowledge of parents on the transmission of parasites and maintenance of hygiene plays a key role in the prevalence of parasites in children. But literacy cannot be concluded because similar as this has not shown any relationship with the distribution of parasites and education.

Conclusion

The present study concludes that prevalence of *Giardia* is relatively high among the protozoan and *Ascaries* was found in high rate among helminth. These parasites are the causative agent of an intestinal disorder in developing country like Nepal. In this study, we can conclude that the prevalence of parasites is relatively high in the summer season in the month of May followed by April and June. This result suggests that the intestinal parasitosis occurs more in the summer season. This correlates the incapability of the oocyst to survive longer in the environment during the dry season. This could be a very useful tool to correlate the infection with temperature and rainfall. Among the age group 0-15 more parasites were distributed than in 15-75 age group. Higher presence of parasites in children may be due to higher activity of children, lack of sanitary hygiene and lack of hand washing habit. Helminths were observed less in number. This result may be due to the previously distribution of anti-helminthic drug among the people of the slum area.

Acknowledgements

The authors thank B.P. Smriti Hospital Basundhara, Kathmandu, Nepal for providing the pathology laboratory during this study.

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Volume 3 Issue 5 September 2016