

CORRELATION OF HAEMOGLOBIN LEVEL WITH INTESTINAL PARASITES IN SCHOOL CHILDREN

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ABSTRACT

Objective: To find out the pattern of parasitic infestation and its effect on hemoglobin level in school children at Hayatabad area of Peshawar.

Material and Methods: Stool and blood samples from 230 school children in Hayatabad were collected during October, 2004 to May, 2005. The stool specimens were examined for parasites using normal saline and iodine, while haemoglobin was estimated by cyanomethemoglobin method in blood samples.

Results: The overall infection rate was 29.1% (n=67/230), of which 6% (n=4/67) showed mixed infection. Among positive cases, *Ascaris lumbricoides* was the commonest (n=26; 38.8%), followed by *Hymenolepis nana* (n=18; 26.9%). *Entamoeba coli* was present in 10.4% (n=7) cases, *Giardia lamblia* in 9% cases and *Entamoeba histolytica* in 6% (n=4) cases. *Taenia saginata* and *Enterobius vermicularis* were present in 3% (n=2), while *Trichuris trichiura* and Hookworm each was found in 1.5% (n=1) cases. The mean haemoglobin in healthy subject was 13.6 g/dl, while in infected subjects it was 11.4 g/dl, the difference was statistically significant (p<0.05).

Conclusion: The health status of the school children needs to be checked and worm infestation is a common problem in school going children.

Key Words: School Children, Parasitic Infestation, Haemoglobin Level, Correlation.

INTRODUCTION

Worm infestation is a common health problem in the world. Its rate varies from country to country and even among different parts of the same country. Several reports regarding the incidence of intestinal parasites are available.

In Ethiopia and Bangladesh the prevalence rate is 70 to 80% respectively.¹⁻² In some parts of India, *Ascaris* infestation has been found 80-90%.³ In Pakistan various surveys have been conducted in different areas.⁴⁻⁶ This problem in our community is more common in children as they are particularly exposed to soil borne infection. In addition, lack of basic education, improper toilet facilities, poor facilities for excreta disposal and unhygienic living conditions play a role in the prevalence of worm infestation. The children suffering from parasitic infection have extra drain on their nutrition. Beside malnutrition other diseases reported in them are recurrent diarrhoea, vomiting, respiratory infections, intestinal obstruction and malabsorption. Continuous malnutrition and malabsorption in school children

affect the health, and well being, resulting in poor scholastic performance. Haemoglobin is one of the most important parameter which decreases because of blood loss from mucosal laceration due to worms and feeding activities of different worm.⁷

The present study was therefore, designed to determine the pattern of parasites and their effect on haemoglobin level among school children in Hayatabad area of Peshawar.

MATERIAL AND METHODS

A total of 230 school children from three different schools of Hayatabad within the age from 5-12 years were selected for the study. Information regarding sex, family members, income, size and condition of the house, toilet facilities, whether day scholar or border and source of drinking water were recorded on a proforma.

Fresh morning stool samples were collected in plastic cups with tight lids and were examined in the laboratory within one hour. The specimens were first examined using normal saline and then Lugol iodine stain was added to it. It was

thoroughly mixed and covered with a cover slip. The slide was then examined under low and high power of microscope.

Negative results were confirmed by the concentration method and by analysing the three consecutive day's samples. Blood samples were also collected containing EDTA as anticoagulant and haemoglobin was estimated.

RESULTS

This study included 230 students from different schools of Hayatabad, Peshawar. (Table-1). Out of 230 students, 106 (46.1%) were males and 124 (53.9%) were females. Out of 230 students 67 (29.1%) had positive stool specimens (table 2). The number of positive cases in the male group was 29 (27.4%), while in the female group the positive cases were 38 (30.6%). The highest frequency was observed for *Ascaris lumbricoides* in 38.8% among infected cases followed by *Hymenolepis nana* in 18 (26.9%) cases.

A slight difference in prevalence of round worm infection was observed in school children coming from adjoining villages and those in Hayatabad. Children with worm infestation were using open fields in 41.5% (n=28) cases and open latrines in 34.3% (n=23) cases (Table 3).

Parasitic infection was higher in students using water from wells in comparison with those utilizing water from tap and hand pumps. Similarly parasitic infection was higher in students who had a large family size. Among infected subjects double infestation was noted in three cases (4.5%) and triple only in a single case (1.5%).

THE NUMBER AND DISTRIBUTION OF THE SCHOOL CHILDREN

Name of school	Number n=230
Govt High School, Hayatabad	110
Govt High School for Girls, Hayatabad	46
Forward High School, Hayatabad	74

Table 1

The mean haemoglobin of healthy and infected subjects was 13.6%dl and 11.4gm/dl respectively, showing statistically significant difference (p<0.05).

DISCUSSION

The type and frequency of various parasites vary from region to region especially in pediatric age group. In the present study we found comparatively low positive cases (29.1%). Early research workers have reported a prevalence of 43.9% in school children in Peshawar and 76.6%

TYPES OF INTESTINAL PLARASITES AMONG POSITIVE CASES:

Parasite	Frequency of +ve cases 67/230	Percentage
<i>Ascaris lumbricoides</i>	26	38.8
<i>Hymenolepis nana</i>	18	26.9
<i>Entamoeba coli</i>	7	10.4
<i>Giardia lamblia</i>	6	9.0
<i>Entamoeba histolytica</i>	4	6.0
<i>Taenia saginata</i>	2	3.0
<i>Enterobius vermicularis</i>	2	3.0
<i>Trichuris trichiura</i>	1	1.5
Hookworm	1	1.5

Table 2

in children of district Dir.⁸ Our results are however, in line with the reported incidence (30%) from Islamabad.⁵ The reason may be that both the areas are comparatively clean and people there are educated and aware of health hazards.

Ascaris lumbricoides was dominant in our results (38.8%). A similar high prevalence rate of round worm has also been reported from the school children in Chitral during the 1999 international Hindu Kush Expedition and during the subsequent summer.⁹ However, in a study in Saudi Arabia only 1% *Ascaris lumbricoides* was found.¹⁰ The reason may be lack of surface water, use of flush latrine and dry weather.

Hymenolepis nana was second most prevalent worm infestation in our study (26.8%). Similar prevalence (26%) was found in children of a previous study at Peshawar.⁵ *Giardia lamblia* was observed in 6 cases. The incidence is lower in comparison with the early study.⁴ This parasite is often found in faecally contaminated water. This indicates that water of Hayatabad is not more contaminated as compared to other places.

It is of interest to note that only a single case of hookworm was detected. In comparison, 3.6 % cases have been reported from Dir.⁹ The reason for low incidence may be the educated environment in Hayatabad and children there do not walk barefooted.

The mean haemoglobin in infected subjects was 11.4 g /dl which is below the normal range. This means that parasites receive nourishment from infected subjects. Some parasites suck blood from the host. Growth retardation in children not only results from infection, but from malnutrition.¹⁰ Large family size and malabsorption are also other factors affecting haemoglobin level indirectly.

The study has highlighted the need to

improve the health status of the school children. Worm infestation is a common problem in school going children.

REFERENCES

1. Merid Y, Hegzy M, Mekete G, Teklemeriam S. Intestinal helminthic infection among children at Lake Awassa area, South Athopia. *Ethop J H-Development* 2001;15:31-7.
2. Gilgen D, Taylor MCG N, Rosetta L. Intestinal helminth infections, anaemia and labour productivity of female tea-pluckers in Bangladesh, *Trop Med Int Health* 2001; 6: 449-57.
3. Paul I, Gnanamani G, Nallam NR. Intestinal helminth infections among school children in Visakhapatnam. *J Nutr* 2000; 130:1412-20.
4. Naz S. Impact of socio-economic status and hygiene conditions on the prevalence of intestinal parasites in school going children of Peshawar. (2000). M.Sc. thesis, Department of Zoology, University of Peshawar.
5. Pal RA, Tana SI. Incidence of intestinal parasites in twin city of Islamabad Rawalpindi. *J Pak Med Assoc* 1973; 33:33-8.
6. Siddiqui MN, Bano L. Observation of parasitic infections in school children of Peshawar. *Pak J of Zoology*. 1979; 11:109-113.
7. Chakma T, Rai PV, Tiwary RS. Prevalence of anemia and worm infestation in tribal areas of Madhya Pradesh. *J Ind Med Assoc* 2000; 21:54-58.
8. Khan SB. Intestinal pathogen parasitosis in residents of Dir. *Rawal Med J*. 1976; 4: 21-4.
9. Raymond CS. Intestinal helminthic infections in primary school children from the Chitral and Kalash regions of North West Pakistan. In: *Chitral- A Hidden Paradise of the Hindu Kush*. Proceedings Linnean Society of London. 23rd Nov, 2000.
10. Moslim UK, Serag ED, Shashi A. Prevalence of intestinal parasites among patients in the Abha region. *Annals of Saudi Medicine* 1989; 9: 471-74.
11. Mwanri L, Worsley A, Paud R, Masika J. Supplemented vitamin A improves anaemia and growth in anaemic school children in Tanzania. *J Nutrition* 2000;130: 2691-6.

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