

Nutritional Status of Kashmiri Children (2-10 years) Suffering from Parasitic Infestation: A Hospital Based Study

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Abstracts: Background: Worms are among the major causes of human misery and death in the world today. An important source of nutritional and energetic stress in many populations is infectious diseases, such as diarrheal disease, respiratory infections, and parasitic infections. The helminthes disease in Kashmir valley particularly the Ascariasis is mainly present in children from low socio-economic status. Kashmiri Children are most vulnerable to developing malnutrition and are likely to suffer from the effects of helminthiasis. Objective: The aim of the present study is to determine the relationship between Helminthic infection and nutritional status of the Kashmiri children. Methodology: An analysis of 100 patients (both boys and girls) suffering from parasitic infestation in the age group of 2-10 years was done in the present study. On the basis of clinical presentations, physical findings the nutritional status of Kashmiri children suffering from parasitic infestation was determined. Results: The majority of the patients belong to the age group of 2-4 years, correlation between higher prevalence of parasitism and poor environment situation was observed and malnutrition is observed a major cause of the disease. Mothers of patients had low literacy rate as comparison to father. Majority of the patients had the MAC, chest circumference as well as head circumference much less than the normal. Interpretation & conclusion: Kashmiri children suffering from parasitic infestation have a very poor nutritional status, Anorexia, Diarrhoea, Vomiting, Fever, Respiratory infection; Anaemia and Dry cough were major complaints in all patients. Lack of personal hygiene, exclusive use of unboiled water, pica and field defecation increased risk of worm infestation. Helminthiasis is a common health problem among preschool children. Its association with malnutrition dictates that urgent steps need to be taken to prevent children from being infested if under-five mortality is to be reduced. This may be achieved through improvement in sanitary conditions of the environment, deworming and proper nutrition of the child. [Nisar R et al NJIRM 2012; 3(2) : 104-109]

Key words: Parasitic Infestation, Nutritional Status, Pre-School Children, Anthropometry, Dietary Assessment

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Introduction: Helminths or worms are among the major causes of human misery and death in the world today. Helminthic infection has remained a problem in the tropic and subtropics. Infectious diseases, such as diarrheal disease, respiratory infections, and parasitic infections, are an important source of nutritional and energetic stress in many populations. Although they rarely cause death, parasitic infections, such as the soil-transmitted helminthes worms, have received research attention for their capacity to subtly impact nutrition, growth, cognitive development, and life-long health of humans^{1,2,3,13}. Intestinal parasites are among our oldest pathogens and represent a nearly continual infection for the

majority of human and non-human primates. Even in the absence of overt disease, long-lived helminthic infections may cause chronic immune activation and nutritional stress associated with poor growth patterns^{5,6}.

The term soil-transmitted helminth refers to a group of roundworms (class nematode) that are transmitted from person to person through contact with fecally contaminated soil. This group includes *Ascaris lumbricoides*, *Trichuris trichuria*, the hook worm species (*Ancylostoma duodenal* and *Nectar americanus*) and *Strongyloides stercoralis*^{7,8}. The World Health Organization (WHO) estimates that infection with round worm (*Ascaris lumbricoides*) and

hook worms (*Ancylostoma duodenale* and *Nectar americanus*) with associated morbidity, affect approximately 250 million, 46million and 151 million people, respectively⁹. The helminthes disease in Kashmir particularly the *Ascariasis* is mainly present in children from low socio-economic group / background who are illiterate and whose standard of living is poor are mostly affected, so far as the *Trichuriasis* is concerned it has 35-40% prevalent rate in Kashmir. *Taeniasaginata*, this worm is present in beef so it is called beef tape worm. It is mostly found in Muslims who are taking the raw or uncooked beef. The prevalence of *Taenia saginata* is good in Kashmir. Children under the age of five are most vulnerable to developing malnutrition and these same age groups are the ones that are likely to suffer from the effects of helminthiasis. Malnutrition when it occurs very early in life has the most deteriorious effect^{2,10,11-14}. It is in light of this that this study sets out to determine the implication of helminthic infection on nutritional status of children.

Objective of the study: To determine the relationship between Helminthic infection and nutritional status of the children. To assess the anthropometric data of the sample group for body weight, height, chest circumferences, mid-arm circumference, and comparing it with the standards.

Material and Methods:The present study was carried out in Paediatric Department of GB Pant Hospital (Ward I and OPD), Srinagar. The samples of 100 patients (both boys and girls) were selected randomly from Paediatric Department of GB Pant Hospital (Ward I and OPD), Srinagar. Oral concern of patients was taken for the study. The permission regarding the data collection for the study was taken from hospital authorities. For the selection of sample simple random sampling procedure was applied. The data was collected by using self prepared schedule structured for the study. The data obtained was carefully scrutinized, categorized, coded and statistically analyzed through statistical software package SPSS 16.0

version. The results were considered highly significant at the p-value of less than 0.01; while significant at p-value less than 0.05. The results obtained are non-significant at p-value greater than 0.05.

Result: Below given Table 1 depicts that majority of the patients belonged to the age group of 2-4 years (boys = 26% and girls 28%) (P> 0.05). Sex wise distribution indicated that 54% are girls and 46% are boys. Among the studied sample, patients hailing from rural areas formed the majority i.e. 68% whereas the remaining 32% were from urban locality. Statistically, difference is significant in rural and urban areas (P< 0.01).

Table 1: Socio-demographic attainments of the study population

Age	Boys	Girls	P-value	
2-4	26	28	> 0.05	
4-6	10	14		
6-8	6	10		
8-10	4	2		
Residence				
Urban	8	24	< 0.01	
Rural	38	30		
Type of family				
Nuclear	26	38	> 0.05	
Joint	20	16		
Education of parents		Father	Mother	< 0.01
Illiterate	54	72		
Literate	46	28		

It is evident from the Table 1 that 64% of patients belonged to nuclear family where as 36% of patients' belonged to joint family (P> 0.05). Information regarding educational status of parents was also collected. Illiteracy rate among parents was high. The illiteracy rate is higher among mothers i.e., 72% in comparison with father i.e., 54% (P< 0.01).

Table 2: Health and Hygiene of the study population

Health & hygiene of the study population	Percentage (%)	χ^2	P-value
Characteristics			
Source of drinking water			
Tap	70	110.24	< 0.01
Well	4		
River	14		
Stream	12		
Type of lavatory			
Open	30	91.04	< 0.01
Kaccha	4		
Pit	4		
Flush system	62		
Location of lavatory			
Within house	62	5.76	< 0.01
Outside the house	38		
Wash hands after defecation			
Wash	60	4.00	< 0.05
Does not	40		
Nature of onset of disease			
Insidious	66	10.24	< 0.01
Sudden	34		
Evidence of pica			
Age		40.57	< 0.01
2-4	34		
4-6	12		
6-8	6		
8-10	4		
Deworming history			
Dewormed	60	4.00	< 0.05
Not dewormed	40		
Nail biting			
Yes	76.00	27.04	< 0.01
No	24.00		

It is evident from Table 2 that 70% of patients drank tap water, 4% drank well water, 14% drank River water and 6% drank stream water ($P < 0.01$). The present study shows results that

indicate a correlation between higher prevalence of parasitism and poor environmental sanitation. Among the studied sample 30% of patient went for open defecation. 4% used Kaccha lavatory, 2% used pit type ($P < 0.01$). Majority of sample 62% were used flush system for defecation. It was found through the study that 62% of patients had lavatory inside the house and 38% of patients had lavatory outside the house ($P < 0.01$). It was found that 60% patients wash their hands after defecation and 40% of patients did not wash their hands after voiding. It was observed that in 66% of patients the disease had an insidious onset, whereas, in 34% it was sudden ($P < 0.01$). It has been observed that 56% of patients complained of pica, with higher incidence in the age group of 2-4 years. Only 44% of patient did not complained of pica. Pica is closely associated with anaemia and malnutrition ($P < 0.01$). There are evidences suggesting that anaemia causes pica which in turn causes worm infestation. Perusal of the results showed that 40% of patients had never been dewormed. This explains the reasons for heavy worm load among children, it was found through the study that 76% of patients had habit of whereas 24% of patients did not had the habit of nail biting ($P < 0.01$).

Table 3: Distribution of patients according to height and weight

BMI	Age				
	2-4	4-6	6-8	8-10	Overall
	%	%	%	%	%
8-8 – 12.5	3.8	9.0	10	33.83	8
12.5-14.5	61.5	54.6	60	66.7	60
14.5-16.5	34.7	36.4	20	-	30
16.5-18.5	-	-	10	-	2
Total	100	100	100	100	100

Table 3 says that majority of the patients suffering from helminthic infestation had chronic energy malnutrition 60% followed by 30% and 8%. Only 2% had normal weight.

Table 4: Distribution of patients according to Chest circumference Mean ± S.E.

Age in years	Chest circumference Boys Mean ± S.E.	Chest circumference Girls Mean ± S.E.	P-value
2-4	47.87 ± 0.55	47.50 ± 0.82	> 0.05
4-6	51.40 ± 0.84	52.46 ± 0.37	> 0.05
6-10	57.34 ± 1.5	53.93 ± 1.4	> 0.05
Overall	50.70 ± 0.92	50.21 ± 0.76	> 0.05

It is observed from the Table 4 that the normal standard for chest circumference is different according to the age group. In all the age groups both the sexes show negative deviation from the standards¹⁵ (P > 0.05).

Table 5: Distribution of patients according to Head Circumference Mean ± S.E.

Age in years	Head circumference Boys Mean ± S.E.	Head circumference Girls Mean ± S.E.	P-value
2-4	46.02 ± 0.45	44.63 ± 0.65	> 0.05
4-6	49.08 ± 1.00	48.33 ± 0.53	> 0.05
6-10	53.70 ± 0.99	53.62 ± 0.28	> 0.05
Overall	48.36 ± 0.76	47.35 ± 0.78	> 0.05

It is evident from the Table 5 that the normal standard for head circumference is different according to the age group. In all the age groups both the sexes shows the deviation from the standard¹⁵ (P > 0.05).

Table 6: Distribution of patients according to Mid-Arm Circumference (Mean ± S.E.)

Age in years	Mid circumference Boys Mean ± S.E.	Mid circumference Girls Mean ± S.E.	P-value
2-4	13.26 ± 0.78	12.20 ± 0.63	> 0.05
4-6	13.12 ± 0.49	12.63 ± 0.24	> 0.05
6-10	15.20 ± 0.80	14.10 ± 1.0	> 0.05
Overall	13.65 ± 0.50	12.73 ± 0.42	> 0.05

Table 6 represents the mean anthropometric measurement of Mid-Arm circumference. The normal standard for Mid Arm Circumference is

different according to the age group. In all the age groups both the sexes show negative deviation from the standards¹⁵ (P > 0.05).

Table 7: Distribution of Patients according to the symptoms that existed in past

Symptoms/past	Age Years				Present	Absent
	2-4	4-6	6-8	8-10		
Abdominal Pain	44	20	16	6	86	14
Anal pruritis	22	8	6	6	42	58
Nose picking	26	10	8	4	48	52
Distention of abdomen	26	18	8	2	60	40
Loss of appetite	48	20	12	4	84	16
Fever	46	24	16	6	92	8
Persistent intestinal infection diarrhoea	22	10	2	0	34	66
Nausea	26	10	8	2	46	54
Anaemia	38	22	16	6	82	18
Dry Cough	38	16	16	2	72	28

The history of past illness among patients is given in Table 7. There are number of symptoms that were experienced by patients e.g. Abdominal pain, Anal pruritus, Nose picking, distention of abdomen, loss of appetite, fever, Intestinal infection, Diarrhoea and dry cough. Abdominal pain has been reported in 44% of patients with higher incidence in the age group of 2-4 years. Anal pruritus has been present in 22% of patients with higher in the age group of 2-4 years. Nose picking and distention of abdomen is observed among 26% and 32% respectively in the age group of 2-4 years. Fever has been present in 46% of patients with higher incidence in the age group of 2-4 years and 24% in the age group of 3-4 years. Diarrhoea, nausea and anaemia had been experienced in 22%, 26% and 38% of patients with higher incidence in the age group of 2-4 years. It has to be concluded that majority of the symptoms have been experienced by patients at the age group of 2-4 years.

It is evident from the Table 8 that the percentage of sample that were having abdominal pain even after receiving antihelminth, account for 40%. On the other hand the patients who did not receive any drugs including antihelminths were 50% even after receiving multivitamins 8% of sample were having anemia. On the other hand the patients who did not receive any drugs including antihelminths were 76% patients suffering from fever received other medicine accounted for 14% including antihelminths. Patients suffering nausea and nose picking received no antihelminths drug but received multivitamins that accounts 14% and 6% respectively. 28% Patients suffering from loss of appetite received no treatment.

Table 8: Distribution of patients according to presence of complication & the treatment given

Complication	Treatments Given			
	Anti helminths	Multi Vitamins	Other Medicine	No Treatment
Abdominal Pain	40	6	4	50
Anal pruritis	22	0	0	78
Nose picking	26	10	8	4
Distention of abdomen	30	12	4	54
Loss of appetite	6	18	20	56
Fever	6	50	14	30
Diarrhoea	4	18	0	78
Nausea	0	14	4	82
Anemia	0	8	16	76

Conclusion: It is concluded from the above study that children suffering from parasitic infestation has a very poor nutritional status. Anorexia, diarrhea, Vomiting, fever, respiratory infection, Anemia and dry cough were major complaints in all patients suffering from parasitic infestation. Malnutrition has been more common among these children. Pica has been observed among majority of the patients. Lack of personal hygiene was one of the most important factors responsible for heavy worm

load among the patients. Most of the patients had never been dewormed. It was observed that more children were seen with dirty nails due to lack of awareness regarding personal hygiene. In lights of this, the government should ensure that policies are in place to enforce the provision of at least ventilated improved pit latrines by owners/builders in their homes. Health education in the clinics should strongly advocate rigorous hand washing especially after defecation and before preparation of meals. In addition, periodic deworming at the intervals of 1-3 months should be undertaken. This may be needed where protein energy malnutrition is highly prevalent.

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