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SEASONAL PREVALENCE OF SOIL TRANSMITTED HELMINTHS IN THE POPULATION OF KOSI REGION OF NORTH BIHAR.

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ABSTRACT

STH infection was studied in three periods during summer, rainy and winter seasons. Out of 528 faecal samples, 256 children (80 males, 32.5%) and 272 adults (128 males, 25% and 144 women, 30.5%) showed helminthic infection in rainy season. Much variation was seen in the prevalence of diseases in rainy and winter seasons in all age groups. The infected individuals were treated with albendazole just after rainy season. Three weeks after anti-helminthic treatment the infection rate among them was lower; health education plays a role in reducing the infection.

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KEY WORDS : Kosi region, North Bihar, STH

Introduction

Soil transmitted helminthes also known as geohelminthes are four main nematode species of human which are *Ascaris lumbricoides*, *Trichuris trichiura* (whip worm), *Ancylostoma duodenale* and *Strongyloides stercoralis*. These infections are most prevalent in tropical and subtropical region of the developing world where adequate water and sanitation are lacking, with recent estimates suggesting that *A. lumbricoides* infects 1221 million people *T. trichiura* 795 million and hookworms 740 million¹. The greatest number of STH infection occur in China, India and south America. Chronic and intense STH infection can contribute to malnutrition and iron deficiency anaemia and also can adversely affect physical and mental growth in childhood². In recognition of the global health importance of STH infections, there is a renewed global commitment to finance and implement control strategies to reduce the disease burden of STH and other helminths³. In Kosi region no study has been done to assess the environmental risk due to the presence of helminthic eggs in the soil. Study would focus on parasite infecting human and the environmental factors.

Material and Methods

The Kosi region is located in the north Bihar. It is the vast area starts from Darbhanga and extends upto Nepal. It is situated between 25.88°N -26.7° N latitude and 86.30° E-86.7° E longitude. The climate in Kosi is naturally divided into three well marked seasons the winter, the summer and the rainy season. The ecosystem basis of this area is paddy fields, wet land and marshes. The level of hygiene and sanitation is very poor, most of the village houses are without latrines and people defecate in open fields behind house yards. Proper water supply to houses is not available. Source of drinking water is pond or hand pump or open well only.

Survey and Analysis

Data on the prevalence of STH diseases in area were not available from the present study area. At the beginning of the study village programmes were initiated to create awareness among the people.

Sample Design

The stool samples were collected from 528 subjects having 256 children and 272 adults of Kosi region. Data were also collected on the living

TABLE-1: Prevalence of STH among children of Kosi region according to age & sex in rainy season

SEX	AGE (in years)			TOTAL
	0-4	5-9	10-19	
BOYS	0%	41.6%	40%	32.5%
	16	24	40	80
GIRLS	8.3%	0%	22.5%	11.3%
	24	72	80	176
TOTAL	5.0%	10.4%	28.3%	17.9%
	40	96	120	256

Number of parenthesis indicates the sample size.

Number of children tested=256

Number of children infected=46

% of infection=17.9%

conditions of the imputed individual.

Stool sample collection

The purpose of study and the procedure for stool samples collection were explained to selected people of the area and oral consent was taken. Stool containers were distributed to the subjects each

labeled with the name, age, sex of the participants and sampling location. The faecal samples were collected on the next morning and were brought back to the operation center where each faecal sample was fixed with 10% formalin. Then formalin fixed samples were examined using formalin ether technique at the parasitological laboratory within

TABLE-2 : Prevalence of STH among adults of Kosi region according to age & sex in rainy season.

SEX	AGE(in yrs)					TOTAL
	20-29	30-39	40-49	50-59	>60	
MEN	100%	25%	6.2%	0%	50%	25%
	8	56	32	16	16	128
WOMEN	41.6%	30%	0%	41.6%	12.5%	30.5%
	48	40	16	24	16	144
TOTAL	50%	27%	4.5%	25%	31.2%	27.9%
	56	96	48	40	32	272

Number in parenthesis indicates the sample size.

Number of adults tested =272

Number of adults infected=76

% of infection=27.9%

Overall % in Kosi=23.1%

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TABLE-3: Prevalence of STH among children of Kosi region according to age & sex in winter season.

SEX	AGE (in years)			TOTAL
	0-4	5-9	10-19	
BOYS	0%	33.3%	30%	25%
	(16)	(24)	(40)	(80)
GIRLS	0%	0%	20%	9%
	(24)	(72)	(80)	(176)
TOTAL	0%	8.3%	23.3%	14%
	(40)	(96)	(120)	(256)

Number in parenthesis indicates the sample size.

Number of children tested =256

Number of adults infected=36

% of infection=14%

12 hours for the cyst and ova of STH parasites.

Epidemiological surveys was carried out from month july 2009 to june 2010(on alternate days within 10 days period). The prevalence of infection was recorded in rainy (July-October 2009) winter (November 2009 - February 2010) and summer (March 2010 - june 2010) season. After the survey in the rainy seasons the infected persons were examined with a single dose of antihelminths drug

albendazole 500mg under the supervision of government doctor.The occurrence of infection was again tested after 3 weeks period.

Results

Prevalence of helminthic infection in rainy seasons

Out of 256 children (80 males,176 females)males of 5-9 and 10-19 years showed 41.6 and 40% of infection respectively.(Table-

TABLE- 4: Prevalence of STH among adults of Kosi according to age& sex in winter season.

SEX	AGE(in yrs)					TOTAL
	20-29	30-39	40-49	50-59	>60	
MEN	75%	21.4%	0%	0%	37.5%	18.7%
	(8)	(56)	(32)	(16)	(16%)	(128)
WOMEN	33.3%	20%	0%	33.3%	0%	22.5%
	(48)	(40)	(16)	(24)	(16)	(144)
TOTAL	42.8%	25%	0%	20%	25%	23.5%
	(56)	(96)	(48)	(40)	(32)	(272)

Number in parenthesis indicates the sample size.Number of adults tested =272

Number of adults infected=56

% of infection 20.5%

Overall % in Kosi=17.4%

TABLE-5: Prevalence of STH among children of Kosi according to age& sex in summer season

SEX	AGE (in years)			TOTAL
	0-4	5-9	10-19	
BOYS	0%	33.3%	40%	30.0%
	16	24	40	80
GIRLS	0%	0%	20%	9.0%
	24	72	80	176
TOTAL	0%	8.3%	26.6%	15.6%
	40	96	120	256

Number in parenthesis indicates the sample size.

Number of children tested =256

Number of adults infected=40

% of infection=15.6%

1),while 0-4 years were free from helminthes. Female of 0-4 and 10-19 age groups showed 8.3 and 22.5% respectively and 5-9 year group did not lodge infection. Of 272 adults examined males and females showed 25 and 30.5%infection respectively(Table-2).Males of 20-29 age group has higher prevalence of STH(100%) 30-39,40-49 and >60 years showed 25,6.2 and 50.0% of infection respectively.50-59 years were found negative for helminthic infection. Females of 20-29,30-39,50-59 and >60 years showed 41-6,30,41.6 and 12.5% of infection respectively. While 40-49 years were free from the risk of infection .

Prevalence of helminthic infection in winter seasons

Out Of 256 children tested, males of 5-9 age group 33.3%and10-19 age group 30.0% were found infected with STH while 0-4 years were free of infection. Females of 10-19 years age group showed 20% of infection, the age group of 0-4 and 5-9 years, were found negative for helminthic infections.(Table-3).The prevalence of infection was found to be low in adults when compared to other seasons and before treatment. Males of 20-29,30-39 and >60 years showed 75,21.4 and 37.5% infection respectively(Table-4).The age groups of 40-49 and 50-59 were found free of infection . Females of 20-29,30-39, 50-59 age group showed 33.3,20.0 and 33.3% infection respectively. While 40-49 and >60 showed no infection.

Prevalence of helminthic infection in summer seasons

Out of 256 children (Table-5)30.0% males, 9.0% females were infected with STH. Males of 5-9 and 10-19 age groups lodge of 33.3 and 40.0% infection; while the 0-4 age group children were free from helminthic infection. Males of 20-29, 30-39 and above 60 years age groups had higher prevalence of STH (33.3 ,20 and 33.3%) 40-49 and 50-59 age groups were safe from the risk of helminthic infection(Table-6).

Seasonwise prevalence

Incidence of STH was higher in all the age groups in rainy season when compared to summer season (Table-7); this could be due to higher exposure stress. Comparatively lower incidence of STH was noticed in all the age groups in winter season.

Discussion

The intestinal parasitism represents a major public health problem. Majority of population in India belongs to the lower socio-economic group; The present study on the estimation of the prevalence of various intestinal parasitic infestation reveals that in rural areas ,the prevalence rate of intestinal parasites can reach as high as 67-100%.Scarcity of basic infrastructure, unhygienic environment consumption of improperly cooked contaminated food and contaminated water may contribute to high prevalence of intestinal parasites⁴ in rural children living in and around Chennai. The

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TABLE-6: Prevalence of STH among adults of Kosi according to age& sex in summer season.

SEX	AGE (in yrs)					TOTAL
	20-29	30-39	40-49	50-59	>60	
MEN	100%	28.5%	0%	0%	50%	25%
	8	56	32	16	16	128
WOMEN	33.3%	20%	0%	33.3%	0%	22.5%
	48	40	16	24	16	144
TOTAL	42.8%	25%	0%	20%	25%	23.5%
	56	96	48	40	32	272

Number in parenthesis indicates the sample size.

Number of adults tested =272

Number of adults infected=32

% of infection=23.5%

Overall % in kosi=19.6%

The prevalence rate is 23.5% of STH(Table-6).

TABLE-7:-Prevalence of STH among adults of Kosi according to age& sex in summer season.

AGE GROUP	NO. OF SUBJECTS	STH INFECTION		
		SUMMER SEASON	RAINY SEASON	WINTER SEASON
0-4	40	0 8.2	5	0
5-9	96		10.4	8.3
10-19	120	26.5	28.4	23.2
20-29	56	42.7	50.1	39.1
30-39	96	25	27	20.7
40-49	48	0	4.1	0
50-59	40	20	25	20
>60	32	25	31.1	18.6

high prevalence of STH in the study area shows the poor proper personal and community hygiene. The habit of leaving faeces behind their houses led to the pitiable condition of unhygienic environment in Kosi area .

In the present study, 0-4 and 40-49 age groups were free of STH in summer and winter seasons in koshi .STHs were recorded in all the infecting children and adults in the study area. The

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prevalence of STH infection in the present study was found to be higher in male children and male adults than in female children and female adults. This may be related to their social habits of the Koshi people; the male folk work more in the fields and outdoors, and therefore are prone to heavy infection as compared to females. The prevalence of STH in this area related to the status of personal hygiene practiced in the females.

In the summer season

The % of prevalence of STH was found to be low in the people of Koshi. 40-49 and 50-59 age groups were safe from the risk of helminthic infection.

In rainy season

The age group (males) of 5-9 and 10-19 years were identified as high risk groups lodging

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41.6 and 40.0% infection. These observations are simple to those of earlier worker¹¹ who also found the age groups of 5-9 and 10-14 as high risk age groups for STH.

In winter season

It is interesting to note that in both children and adults the % of infection declined by winter season.

Conclusion

The prevalence of STH in the study area was highest in rainy season because higher rainfall during monsoon season provides suitable conditions for the transmission of parasites in the soil. The control of STH infection in study area can be achieved with health education together with good hygiene.

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