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## **Sex-wise prevalence rate of total and specific intestinal protozoan and helminth parasites in rural areas of Saran**

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**Abstract:** Present study on prevalence percentage of total and specific intestinal parasites of rural areas of Saran district of Bihar was studied and for which 15732 single stool samples from 15 C.D. blocks, comprising 9079 (57.71%) males and 6653 (42.29%) females, were collected on random sampling basis and microscopically examined. The sex-wise prevalence rate of total intestinal, total protozoan, specific protozoan, total and specific helminth parasites in rural population of Saran district has been exhibited interesting results.

**Keywords :** Helminth, Protozoan, Sex-wise, Enteric parasites stool samples, rural population, infestation.

### **INTRODUCTION**

Humans are subjected to numerous, protozoan, worm and insect related parasites, Parasites vary in the ways they use their hosts. In order to survive from one generation to the next, Parasites have a series of distinct development stages and hosts collectively known as a life cycle. The prevalence of parasitic infection varies with the level of sanitation and is generally higher in the tropics and sub tropics than in temperate climates.

Two-thirds of the world's population live in the less-developed countries that lack proper sanitary facilities and a safe drinking water supply, which leads to transmission of enteric pathogens.

Division of Helminthology National Institute of Communicable diseases, which carried out a total of 110

surveys in various states of the country between 1968-1998. Since 1990 a total of 16 surveys have been undertaken in 14 states. Prevalence of the intestinal parasitic infections was found to vary from 22.8% in Puri district, Orissa to 78% in urban slum localities of Kolkata, West Bengal. So far Bihar state is concerned there has been very little work, note worthy among them are the observation of Chaurasia (1993)<sup>1</sup> who studied the prevalence percentage of intestinal parasites in the rural areas of Vaishali. Saran district of Bihar is devoid of industries and very fertile land. Therefore, a large chunk of male population has emigrated to different parts of the country in search of their livelihood. When they are back, they bring back a variety of intestinal parasites.

### **MATERIAL AND METHODS**

The total collected specimen comprised about 0.67% percent of the total population of the district. Stool

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specimens of 15732 human subjects, obtained by random sampling basis from different rural area of Saran district. Individual details were collected on a printed questionnaire. Thoroughly cleaned 100ml. capacity containers with pasted paper label were distributed to the human subjects one day earlier for the collection of their morning stool samples. Details were recorded on the questionnaire.

The collected fecal samples were subjected to microscopic examination, with view to identify the larvae, cysts, tapeworm proglottids, adult worms. Three slides of each stool sample were made by three different methods for their microscopic examination. Saline preparation was done under Direct Smear method for protozoan trophozoites. Iodine stain preparation was prepared as per recommendation of Dobell and O. Conner (1921). A loopful of stool sample was first diluted and classified in 1 or 2 drop of 0.9% normal saline on a very clean glass slide and then one drop of aqueous Iodine solution was put on the saline emulsion and spread in a thin film. The slide was subjected to microscopic examination.

The least expensive and most satisfactory results for the helminth eggs and embryos was obtained by employing simple floatation technique of moplestone (1940) under concentration method, under sadimentation method formol-Ether Concentration method was found to be the best of all the three methods employed (Ridley and Howgood (1956)<sup>2</sup>, Allen and Ridley (1970)<sup>3</sup>, Prasad, Sinha and Kapoor (1978)<sup>4</sup> suggested Kerosene or Turpentine as a cheaper substitute in lieu of dearer Ether.

In the microscopic routine examination of stool samples, it is very difficult to differentiate morphologically the eggs of *Necater americanus* and *Ancylostoma duodenale* and hence, both these species have been referred to as 'Hook worm' in the present study.

### RESULT AND OBSERVATION

The sex-wise prevalence rate of total intestinal, total protozoan, specific protozoan, total and specific helminth parasites in the rural population of Saran district has been exhibited in Table-1 and 2.

**Table 1-Prevalence Percentage of Protozoan, Helminth and Total Intestinal Parasites in Studied Stool samples infected with following**

Sex		No. of samples ex.	Protozoan parasites only	Helminth parasite only	Mixed parasites	Total Protozoan parasite	Total Helminth Parasite	Total Intestinal Parasite
M	No	9079	1369	4080	954	2323	5034	6403
	%	57.71	15.08	44.04	10.51	25.59	55.45	70.52
F	No	6653	866	2871	653	1519	3524	4390
	%	42.29	13.02	43.15	9.81	22.83	52.97	65.90
T	No	15732	2235	6951	1607	3842	8558	10793
	%	100%	14.21	44.18	10.21	24.42	54.40	68.60

**Table 2- Prevalence percentage of Specific Intestinal Protozoan and Helminth Parasites in Studied Population**

Sex	No. of Samples Exam.	Sample Infected	E.h.	G.i	E.C.	T.h.	O (P)	R. W.	H. W.	T. t.	H. n.	E. v.	T. S.	S. S.	O (H)
M%	9079	6403	1221	1078	263	123	10	3467	1037	198	181	113	80	61	18
	57.71	70.52	13.45	11.87	2.40	1.35	0.11	38.19	11.42	2.18	1.99	*1.24	0.88	0.67	0.20
F %	6653	4390	826	696	177	81	6	2417	720	101	122	63	50	37	12
	42.29	65.98	12.41	10.46	2.66	1.22	0.9	36.33	10.82	1.52	1.83	*0.95	0.75	0.56	0.18
T %	15732	10793	2047	1774	440	204	16	5884	1757	299	303	176	130	98	30
	100	68.60	13.01	11.28	2.80	1.30	0.10	37.40	11.17	1.90	1.93	*1.12	0.83	0.62	0.19

\*Corrected Prevalence, Faust & Russel (1964)

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The table show that of the total examined 15732 stool samples, 9079 samples (57.71%) were of the male and 6653 samples (42.20%) of the female subjects respectively. Out of 3842 samples (24.42%) infected with total protozoan enteric parasites, the sex wise prevalence rate was recorded as 2323 samples (25.59%) in the males and 1519 samples (22.83%) in the females respectively. On the basis of sex, the prevalence percentage among the females was significantly lower 4390 samples (65.98%), in comparison to 6403 samples (70.52%) in the males out of single stool samples of males examined 4390 samples (65.98%) were found to be infected with one or more species of intestinal parasites. A total of 4390 samples (65.98%) of females of the district were found to be infected with enteric parasites, out of 6653 examined samples.

### DISCUSSION

It is the first such epidemiological survey to be undertaken in western Bihar. For the purpose, 15732 stool samples from all the 15 C.D. Blocks of the district, comprising 9079 males and 6653 females, were collected and microscopically examined with regard to sex, higher rate of infestation (70.52%) in the males and lower rate (65.98%) in the females is in conformity with the findings of Bagchi *et al.* (1964)<sup>5</sup>, Pradhan *et al.* (1977)<sup>6</sup>, Sinha (1980)<sup>7</sup>, Chaurasia (1993)<sup>1</sup> and Nuch Prayoon, S. *et al.* (2002)<sup>8</sup> but contrary to the findings of Choudhary and Schiller (1968)<sup>9</sup>, Rao *et al.* (1971)<sup>10</sup>, Sen Gupta and Bhattacharya (1975)<sup>11</sup>, Sinha and Sahai (1977)<sup>12</sup>, Goo, G.S. (1998)<sup>13</sup>, Ali-Styaeh (1989)<sup>14</sup> and Kim S.J. (2003)<sup>15</sup>, in Roxas City, Korea, who observed higher prevalence rate in the females, than the males. Higher prevalence rate in the male population may be attributed to more exposure of the males to the parasites. The prevalence rate of total protozoan and total helminth parasites also exhibited higher prevalence rate in the males 25.59% and 54.45% as compared to the females 22.83% and 52.97% respectively. The same was the case with all the specific protozoan and helminth enteric parasites, which showed higher rate of infestation in the male population, as against the females. Plurality of infection was observed to be 8671 samples (55.12%) with one parasites 1901 samples (1.24%) with two parasites, 195 samples (1.24%) with three parasites and 25 samples (0.16%) with four parasites

respectively, which is conformity with the observation of Hong, S.T. (1988)<sup>16</sup> and Machado, E.R. *et al.* (1998)<sup>17</sup>, who noted 87.3% and 64.5% individual infected with one parasite. However, Allen & Ridley (1970)<sup>3</sup>, Gagandeep, K. (1998)<sup>18</sup> and Rivero, R.Z. *et al.* (2000)<sup>19</sup>, observed 95%, 74.3% and 71.6% cases of polyinfection with parasites 23.1%, 33.1% and 16.7% was recorded by Gagandeep, K. *et al.* (1998)<sup>18</sup> and Widjana, D.P. & Sutisna, P. (2000)<sup>20</sup> respectively.

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