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Studies on the religion wise prevalence rate of total and specific protozoan and helminthic intestinal parasites in rural area of Saran, Bihar, India

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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 males and 6653 females, were collected on random sampling basis and microscopically examined. Religion wise, the highest prevalence rate was observed in the muslims (71.75%), followed by the Hindus (67.8%) and Sikh & Others (64.11%) respectively. while in all the specific protozoan and helminthic parasites in the Hindus, Sikhs & Others, the males showed their dominance over the females.

Key words: Prevalence, protozoan, helminthic, intestinal parasites, Saran, Bihar

INTRODUCTION

A parasite is very small life forms that can either an irritant or destroyer or both. The ones that cannot live in the presence of oxygen are commonly found in the intestinal tract, a place containing very little oxygen, where they nourished and propagate.

Two thirds of the world's population lives in the less developed countries that lack proper sanitary facilities and safe drinking water supply, which leads to transmission of enteric pathogens. Most people are not aware of the danger to their health posed by parasites.

Parasites have been known to man, since soon after the differentiation of life began in the world. One can find a lot of literature of epidemiological work on human parasites, carried out in the past in the U.S.A., U.K. other parts of the world and India as well, but little attention has

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been paid towards the plight of rural population. So far Bihar state is concerned there has been very little work, note worthy among them are the observation of Chaurasia (1993)¹, 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 immigrated to different parts of the country in search of their livelihood. This is why it was proposed to study the prevalence rate of Intestinal parasites in man in rural areas of this district. Comprising 15 C.D. Blocks, in this district, the rural population constitutes more than 90% of the total population of the district.

MATERIAL & METHODS

Stool specimens of 15732 human subjects, obtained by random sampling basis from different rural areas of Saran district and belonging to different sex, food-habits, religion and economic strata, were collected and examined

to find out the prevalence rate of intestinal protozoan and helminth parasites. The study was made between January, 2002 to Dec. 2004 and on average 25 to 35 stools were collected and examined every day. The total collected specimens comprised about 0.67 percent of the total rural population of the district. Details of sex, age, religion, food-habit, income, gastro intestinal disorder (if any), source of drinking water, toilet facility etc. of the individuals were recorded on the questionnaire.

The collected faecal samples were subjected to microscopic examination. With a view to identify the larvae, cysts, tapeworm proglottids, adult worms, mucus, blood-stains and consistency of sample. Three slides of each stool sample were made by three different methods for their microscopic examination. The methods employed are Direct Smear method in which saline preparation was done for protozoan trophozoites. Iodine stain preparation was first prepared as per recommendation of Dobell and O. Conner. The least expensive and most satisfactory results for helminth eggs and embryo was obtained by employing simple floatation technique of Maplestone for concentration of faecal cysts, ova and larvae, the formol ether concentration method was found to be the best of all the three methods employed. It is the modified version of

Ritchie's formal Ether Technique (Ridley and Howgood (1956)². Prasad, Sinha and Kapoor (1978)³ suggested kerosene or turpentine as a cheaper substitute in lieu of relatively dearer ether in the formol-ether concentration technique.

RESULT & OBSERVATION

To study the religion wise prevalence rate of total intestinal parasites, the rural population of Saran district, was divided into three categories viz Hindu (Hn), Muslims (Mu) and Others (Oth) comparing the Sikhs, Christian, Buddhists, Jains etc. It was observed that there was some variation in the food-habit of the people due to their religion, and it had some impact on the prevalence rate of intestinal parasites.

Hindu Population: - A total of 10243 stool samples of the Hindu population was examined, out of which 6945 samples (67.80%) were found infested with intestinal parasites, possessing one or more species of the protozoan or helminth or both parasites.

In this group of population, the prevalence rate of only protozoan, only helminth, mixed, total protozoan, total helminth and all the specific protozoan and helminth intestinal parasites was recorded as such:

Table 1. Prevalance percentage of infected samples collected from different localities

Name of group / Species of Parasites	No. of Infected Samples	Prevalence percentage
Only Protozoan	1439	14.05
Only Helminth	4478	43.72
Mixed	1019	9.76
Total Protozoan	2458	24.00
Total Helminth	5497	53.66
<i>E. Histolytica</i>	1308	12.77
<i>G. Intestinalis</i>	1133	11.06
<i>E. Coli</i>	270	2.63
<i>T. hominis</i>	135	1.32
O(P)	11	0.11
Roundworm	3797	37.07
Hookworm	1124	10.97
<i>T. trichiura</i>	179	1.75
<i>H. nana</i>	192	1.87
<i>E. Vermicularis</i>	105	20.40
<i>Taenia Sps.</i>	81	0.79
S. Stercoracis	57	0.56
O (H)	21	0.20

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Muslim Population: - About 27% of the studied population of Muslims altogether 4291 samples were examined and 3079 samples (71.75%) contained one or more species of intestinal parasites.

The prevalence rate of only protozoan, only helminth, mixed, total protozoan and total helminth intestinal parasites

was observed as 638 samples (14.87%), 1973 samples (45.98%), 488 samples (11.37%), 1126 samples (26.24%) and 2461 samples (57.35%) respectively.

The frequency of specific protozoan and helminth intestinal parasites was seen as such:

Table 2- Prevalence percentage of infected samples collected with name of species

Name of Species	No. of Infected Samples	Prevalence percentage
<i>E. Histolytica</i>	596	13.89
<i>G. Intestinalis</i>	522	12.16
<i>E. Coli</i>	146	3.40
<i>T. hominis</i>	54	1.26
O(P)	5	0.12
Roundworm	1675	39.04
Hookworm	513	11.95
<i>T. trichiura</i>	102	2.38
<i>H. nana</i>	93	2.17
<i>E. Vermicularis</i>	61	*28.40
<i>Taenia Sps.</i>	42	0.98
<i>S. stercoracis</i>	35	0.81
O (H)	8	0.19

Sikh and Others:- This category of population comprised of the Sikhs, Christians, Buddhists, Jains and people of other minority communities, excluding the Muslims.

Out of 1198 samples, 769 samples (64.19%) were found to be infected with one or more species of intestinal parasites.

Only protozoan, only helminth, mixed, total protozoan and total helminth parasites were observed in 158 samples (13.19%), 500 samples (41.74%), 100 samples (8.35%), 258 samples (21.53%) and 600 samples (50.08%) respectively.

DISCUSSION

Considering the poor living and sanitary conditions of the surroundings, illiteracy density of population, low per-capita income and seasonal variations, it was proposed to study the prevalence pattern of protozoan and helminth intestinal parasites in the rural population of Saran district of Bihar state. Prior to this work, Korke (1925)⁴, Sharma in Jharkhand and Chaurasia (1993)¹ and Kumar, P & Inam, N. *et al* in Bihar, east of river Narayani has done such investigation. It is the first such epidemiological survey to be undertaken in western Bihar.

The perusal of relevant literature reveals the note worthy contributions of Lane (1917)⁵, Mhaskar (1917)⁶, Korke (1925)⁴, Srivastava (1953)⁷, Baghchi and Prasad (1961)⁸, Amin *et al.*(1962)⁹, Choudhary and Schiller (1968)¹⁰, Sen (1968)¹¹, Rao *et al.* (1971)¹², Sanyal *et al.* (1972)¹³, Rao and Rao (1975)¹⁴, Veeranan (1977)¹⁵, Deokinandan *et al* (1979)¹⁶, Sinha (1980)¹⁷, Prasad (1983)¹⁸, Verma (1985)¹⁹, Bariar (1987)²⁰, Bhatia and Juyal (1989)²¹, Chaurasia (1993)¹, Mirdha and Samantray (2002)²² and Singh (2004)²³.

There is very little information about the correlation of prevalence of intestinal parasites with that of the religion. The contributions of Korke (1925)⁴, Sinha (1980)¹⁷, Prasad (1983)¹⁸, Verma (1985)¹⁹, Bariar (1987)²⁰, Chaurasia (1993)¹, Kumar and Singh are note worthy.

Chermin (1954)²⁴ and Choudhary and Schiller (1968)¹⁰ observed higher prevalence of Roundworm and *T. trichiura* in the muslims, than the Hindus, while Choudhary and Schiller (1968)¹⁰ also observed the higher incidence of Hookworm in the Hindus.

In the present study, the highest prevalence rate of intestinal parasites (71.75%) was observed in the Muslims, followed by (67.80%) in the Hindus and the lowest (64.19%) in Sikh and other community. The same

condition was found with the respect to only protozoan, only helminth and mixed intestinal parasites. Our finding is in very close proximity with that of Chaurasia (1993)¹, who observed 71.87% prevalence rate in the Muslims, as against 71.75% of ours. It is also in confirmity with the findings of Sinha (1980)¹⁷, Prasad (1983)¹⁸, Verma (1985)¹⁹ and Singh (2004)²³.

The highest prevalence rate in the muslims may be assigned to their big families, acute poverty, illiteracy, unhygienic living conditions, habits of living in clusters (Choudhary *et al*, 1968)¹⁰ and stress on non-vegetarian food etc. It was observed that majority of the Muslims were very poor, lived in narrow dark lanes and were fond of keeping poultry with them. This factor may contribute to the unhygienic conditions, suitable for favouring the higher incidence of intestinal parasites in them.

The lowest prevalence rate in the Sikhs, Christians and other minority Communities may be attributed to their better socio-economic conditions and awareness towards sanitation.

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