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Studies on the season-wise prevalence of specific intestinal parasite in the rural areas of Saran, Bihar, India

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Abstract:- Prevalence percentage of total and specific intestinal parasites of rural areas of Saran district of Bihar, India was studied and for which 15732 single stool sample from 15 C.D. block, comprising 9079 males and 6653 females, were collected on random sampling basis and microscopically examined. Highest infestation of intestinal parasites was recorded during SWMS (74.18%), followed by HWS (69.03%), PMS (66.60%) and WS (63.25%) respectively.

Key words: Season-wise, prevalence, developmental stages, sanitation, transmission, enteric, specimen, centrifuge

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 developmental 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 populations live in the less-developed countries that lack proper sanitary facilities and a 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. In the Saran district the rural population constitutes more than 90% of the total population of the district.

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MATERIAL & METHODS

Stool specimens of 15732 human subjects, obtained by random sampling basis from different rural area of Saran district and belonging to different sex, food-habits, religion and economic strata between January 2002 to December 2004 and on an 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. The collected faecal samples were subjected to microscopic examination, with a view to identify the larvae, cysts, tape worm proglottids, adult worms, mucus, blood-stains and consistency of the sample.

Three sides of each stool sample were made by the three different methods for their microscopic examination. For protozoan trophozoites, saline preparation under Direct Smear method was used. In this process a loopful of stool sample was taken on a swab stick and diluted in a drop or two of 0.9 percent normal saline. Under Iodine stain preparation of loopful of stool

sample was first diluted and emulsified in 1 or 2 drops of 0.9% normal saline on a very clean glass slide and then on drop of aqueous Iodine solution (Lugol's Iodine) was put on the saline emulsion and spread in a thin film.

The least expensive and most satisfactory results for helminth eggs and embryos was obtained by employing simple floatation technique. For concentration of faecal cysts, ova and larvae, the formol ether concentration method was found to be the best of all three methods employed. It is the modified version of Ritche's Formol-Ether technique[1,2] Commercial Formalin Solution (10%), Ether, Centrifuge (3000 rpm), glass test tube, swab stick, rubber bands and plastic wire gauze of 7 inch in square (40 mesh per inch) were required in this technique.

RESULT & OBSERVATION

The total examined samples comprised of 9079 male and 6653 female subjects. 10793 persons (68.60%) were found to be infected with one or more species of protozoan and helminth parasites.

To study the season-wise prevalence rate of total intestinal parasites, the season was divided into four seasonal groups. Hot weather season (HWS) from March to May, South west monsoon season (SWMS) from June to August, Post monsoon season (PMS) from September to November and Winter Season (WS) from December to February respectively. In hot weather season 4007 samples of both the sexes of people were examined and 2766 samples (69.03%) were found to be infected with one or more species of intestinal parasites. During hot weather season, 1728 stool samples of male individual were microscopically examined and 1604 sample (70.38%) were found to contain one or more species of protozoan and helminth intestinal parasites. In female 1162 (67.24%) samples were found to be contaminated, from June to August, 4419 samples were examined, out of which 3278 samples (74.18%) contained one or more species of Intestinal parasites. During Post Monsoon Season the prevalence rate of intestinal parasites was found to be lower. It was 2548 samples (66.60%), out of 3826 examined samples. In the winter season out of 3480 samples examined, only 2201 samples (63.25%) were found to be infected with one or more species of Intestinal parasites.

DISCUSSION

Considering the poor living and sanitary conditions of the surrounding, 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, Prasad (1983)[3] and Chaurasia (1993)[4] in Bihar, east of river Narayani had done such investigation. It is the first such epidemiological survey to be undertaken in western Bihar. The persual of relevant literature reveals the noteworthy contributions of Maddex (1904)[5], Lane (1917)[6] Mhaskar (1917-24)[7], Korke (1925-26)[8], Chandler (1925-28)[9], Mukherjee and Mathew (1950)[10], Srivastava (1953)[11], Anand (1954)[12], Bagchi and Prasad (1961)[13], Amin *et al.* (1962)[14], Prakash and Tandon (1966)[15], Choudhary and Schillar (1968)[16], Verma (1985)[17], Bariar (1987)[18], Bhatia and Juyal (1989)[19], Chaurasia (1993)[4], Gagandeep, K. *et al.* (1998)[20], Mirdha and Samantray (2002)[21], Kim (2003)[22] and Singh (2004)[23].

Season wise, highest prevalence rate was observed in the south west monsoon season (74.18%), followed by hot weather season (69.03%), Post-Monsoon Season (66.60%) and the lowest in the winter season (63.25%) respectively. It is in the conformity with the findings of Sinha (1980)[24], Chaurasia (1993)[4.] who also reported the highest rate of incidence in the South West monsoon season. It may be attributed to the period being that of heat, high humidity and rainfall, when the drinking water, fruits, vegetables and other eatables become highly contaminated and start perishing earlier, compared to other season. Ali *et al.* (1989)[25] in Jordan observed parasitic incidence to be higher in summer than in winter season. Sex wise, higher infestation was observed in the males, than in the females in all the seasons while sex-wise frequency of specific, Protozoan and helminth in different season were slightly different. In hot weather season, 0.23% incidence was observed in the females in case of other helminthes, as against 0.22% in the males. In south west monsoon season, the rate of incidence was equal in both the sexes (3.10%) winter season exhibited the lowest prevalence percentage and it was higher in the females.

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