

Prevalence of Intestinal Parasites at a Tertiary Care Centre at Moradabad, Western Uttar Pradesh, India: A One-Year Observational Study.

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ABSTRACT

Background: An intestinal parasitic infection is a serious public health problem in the world, especially in developing countries, and accounts for a major cause of morbidity and mortality among different high-risk groups.^[1] **Aims:** To find out the prevalence of intestinal parasitic infections in Moradabad district in Western Uttar Pradesh and compare and correlate it with gender, age group and area (rural or urban). **Methods:** The stool samples from suspected patients were collected and subjected to routine stool investigations during the study, i.e. Macroscopic examination was carried out for the presence adult worms or their body segments and microscopic examination such as stool wet mounts (both saline and iodine mounts) after Formol-ether concentration technique. **Results:** Out of total 643 patients, 102 (15.86%) had parasitic infection. Maximum numbers of patients were in the age group of 0-10yrs (277, 43.08%) whereas out of these, 36 patients were found positive (13%). Total 112 parasites were isolated from 102 positive patients. Mixed infection with two parasites was most commonly seen in the 0-10yrs age group (7 out of 10 cases), combination of *Giardia lamblia* and *Hymenolepis nana* were most commonly isolated (3 out of 10 mixed infections). Parasite most commonly isolated was Hookworm 35 (31.25%), followed by *Hymenolepis nana* 25 (22.32%) and *Giardia lamblia* 19(16.96%). *Enterobius vermicularis* was the least common isolate 2(1.78%) followed by *Taenia* species, 3(2.68%). Mostly male patients were affected by parasitic infections (59.57%).and most of the positive patients were from rural area, 72(64.28%). **Conclusion:** Prevalence of intestinal parasites is 15.86% in Moradabad district in Western Uttar Pradesh.

Keywords: Formol-ether concentration technique, Macroscopic, Hookworm.

INTRODUCTION

Intestinal parasitic infections is a serious public health problem in the world, especially in developing countries, and accounts for a major cause of morbidity and mortality among different high-risk groups.^[1] The frequency and incidence of Intestinal parasites also varies with age, sex and geography.^[2] WHO (2004) report suggests that approximately 150.9 million people in the world has high intensity intestinal nematodes infection, which is predominant in south East Asia with 37.3 million cases.^[3] The prevalence of intestinal parasites in India varies from 5.56% to 90% as reported by different workers.^[4-9]

Intestinal helminths hardly ever cause death but have high morbidity, thus chronic and subtle effects on Health and nutritional status of the host,^[10,11] they also damage physical and mental development

Of children, prevent educational achievement, and hamper economic development.^[12,13]

Helminths such as *Ascaris lumbricoides*, hookworm, *Enterobius vermicularis* and protozoa like *Entamoeba histolytica* and *Giardia lamblia* are some of the common intestinal parasites responsible for considerable morbidity in young and adult population.^[14]

Teerthanker Mahaveer Medical College & Research Institute (TMMC&RI), is situated at the out skirts of Moradabad city in Moradabad District (located at 28° 49' 48" N, 78° 46' 48" E) and is the only referral centre in Moradabad and adjoining areas. This study was undertaken to know the prevalence of intestinal parasitic infections and the influence of age and sex on prevalence of infections among the patients attending a tertiary care teaching hospital at Moradabad, Western Uttar Pradesh.

MATERIALS AND METHODS

This hospital based study of one year period (July 2009 – June 2010) was carried out in Parasitology section of department of Microbiology, TMMC&RI,

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situated at the outskirts of Moradabad city in Moradabad district, Western Uttar Pradesh (UP).

A total of 643 clinically suspected, randomly selected cases of intestinal parasitic infections of all age groups and both sexes coming to out – patient departments of TMMC&RI were studied. History was taken in relation to name, age, address and area (rural-urban). Patients under antihelminthic treatment were excluded from the study group.

The stool samples from suspected patients were collected and subjected to routine stool investigations during the study, i.e. Macroscopic examination was carried out for the presence adult worms or their body segments and also consistency, colour, odour, blood & mucous, and further microscopic examination of stool wet mounts (both saline and iodine mounts) were made after Formol-ether concentration technique.

RESULTS

A total of 643 patients of clinically suspected of intestinal parasitic infections were included in the study. Maximum numbers of patients were in the age group of 0-10yrs (277, 43.08%) whereas out of these, 36 patients were found positive (13%), followed by 11-20yrs age group (153, 23.79%) and out of these 30 patients were found positive (19.61%) [Table 1 and Figure 1]

Among the total patients (643), male patients, 383(59.57%) were more common than the females, 260 (40.43%). [Table 1]

Total 112 parasites were isolated from 102 positive patients. Maximum number of parasites (43) were isolated from 36 positive patients in the 0-10yrs age group, followed by 32 parasites isolated from 30 positive patients in 11-20yrs age group. Out of total ten cases of mixed infection with two parasites, seven cases were seen in the 0-10yrs age group, while two cases were seen in 11-20yrs age group and one case was seen in 21-30yrs age group. [Figure 1]

Table 1: Age and Gender wise distribution of patients.

| | 0-10 yrs | 11-20 yrs | 21-30 yrs | 31-40 yrs | 41-50 yrs | 51-60 yrs | >60 yrs | Total |
|--------|-----------------|-----------------|----------------|------------|---------------|---------------|--------------|-------------|
| Male | 169 | 83 | 46 | 27 | 26 | 22 | 10 | 383(59.57%) |
| Female | 108 | 70 | 27 | 18 | 18 | 11 | 8 | 260(40.43%) |
| Total | 277 (43.08%) | 153 (23.79%) | 73 (11.35%) | 45 (7%) | 44 (6.84%) | 33 (5.13%) | 18 (2.8%) | 643 |

Table 2: Relationship between Age groups and parasitic isolates.

| | 0-10yrs | 11-20yrs | 21-30yrs | 31-40yrs | 41-50yrs | 51-60yrs | >60yrs | Total |
|----------------------|-------------|-------------|-------------|-----------|-----------|-----------|-----------|-------------|
| Ascaris lumbricoides | 9 | 5 | 0 | 0 | 2 | 0 | 0 | 16 (14.29%) |
| Hookworm | 2 | 11 | 6 | 7 | 3 | 4 | 2 | 35 (31.25%) |
| H.nana | 12 | 8 | 2 | 0 | 3 | 0 | 0 | 25 (22.32%) |
| T.trichura | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 4 (3.57%) |
| Enterobius | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 (1.78%) |
| Taenia | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 3 (2.68%) |
| Giardia | 10 | 5 | 2 | 1 | 0 | 1 | 0 | 19 (16.96%) |
| E.histolytica | 6 | 1 | 1 | 0 | 0 | 0 | 0 | 8 (7.14%) |
| Total | 43 (38.38%) | 32 (28.57%) | 13 (11.61%) | 9 (8.04%) | 8 (7.14%) | 5 (4.46%) | 2 (1.79%) | 112 |

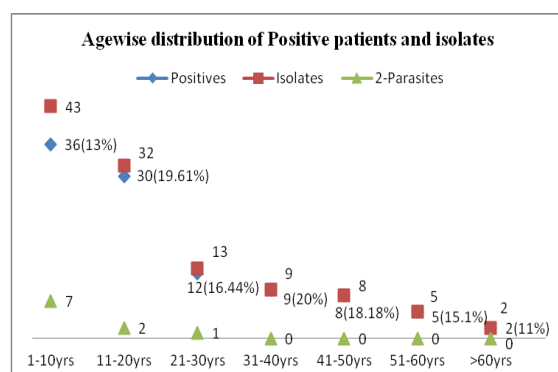


Figure 1: Distribution of Isolates and positive patients according to age groups.

Parasite most commonly isolated was Hookworm 35 (31.25%), followed by Hymenolepis nana 25 (22.32%) and Giardia lamblia 19(16.96%). Enterobius vermicularis was the least common isolate 2(1.78%) followed by Taenia species, 3(2.68%). Maximum numbers of isolates (43, 38.38%) were seen in 0-10yrs age group, followed by 32(28.57%) isolates from 11-20 yrs age group and least number of isolates (2, 1.79%) was from more than 60yrs age group. [Table 2]

Most of the cases of mixed infection were seen in 0-10yrs age group (7 out of total 10 cases). Combination of Giardia lamblia and Hymenolepis nana was most commonly isolated combination (3

out of 10 mixed infections), followed by combination of *Ascaris lumbricoides* and *Hymenolepis nana* and *Giardia lamblia* and *Entamoeba histolytica* (2 out of 10 mixed infections in each case) [Figure 2].

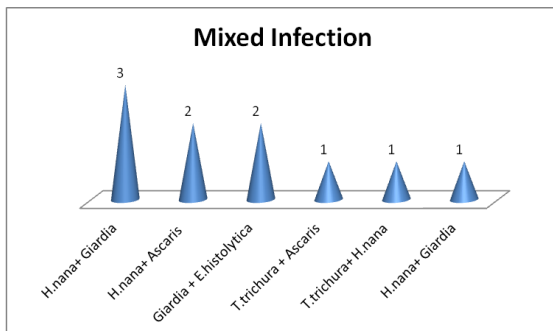


Figure 2: Combination of isolates from mixed infections.

Most of the positive patients were from rural area, 72(64.28%), with the ratio of isolates from Rural to Urban area of 1.8. *Giardia lamblia* was the only parasite which was more commonly isolated from urban areas (11 isolates) as compared to rural areas (8 isolates), *Entamoeba histolytica* and *Trichuris trichura* were equally isolated from both urban and rural areas [Figure 3].

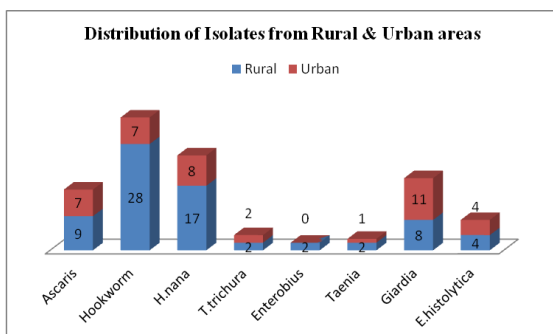


Figure 3: Distribution of Parasites from Rural and Urban areas.

DISCUSSION

Stool examination for parasitic ova, cysts, trophozoite and larvae remains the gold standard for laboratory diagnosis for intestinal Parasitic infections (IPIs). Lack of knowledge of prevalence of parasites in a particular geographic area may lead to misdiagnosis of IPI's as appendicitis and other inflammatory bowel diseases. Only 102 cases were found positive out of suspected 643 cases of intestinal parasitic infections,^[15,16] thus the prevalence rate in this study was 15.86%. Various studies from rural and urban regions have shown different prevalence rates ranging from 5.56% to 46.7%.^[4,17] A similar study, but in school children conducted in same duration in Bareilly district of western UP shows prevalence of 22.81%.^[18] Few studies such as studies, one from Surat, Gujrat and

other from Rohtak, Haryana showed prevalence rate less than ten percent. This might be due to improved sanitary practices, reduced slum areas, personnel hygiene, increased awareness, health education, extreme seasonal variations and geographical area.^[4,19]

In this study, we observed more positive cases in male patients than the female (Male : Female ratio: 1.5:1) [Table 1] which is in concordance with studies at Rohtak, Haryana and other studies,^[18,22, 23] while female predominance is also seen in many studies.^[4,19,21] This high Male: Female ratio may be because females in rural area avoid visiting health facilities until their condition begins affecting their work and home made remedies have failed to provide relief.

Age range of patients varied from 1 month to 86 years. Maximum prevalence was in the age group of 11 – 20 years (13.4%) [Figure 1], which is also seen in other studies.^[22,24] The reason of high prevalence in this group may be their more active life style and involvement in outdoor activities. Maximum numbers of positive cases were seen in the age group of 0-10yrs, which is also seen in most of the studies.^[4,17,19,25] [Table 2]

Prevalence rate was higher in rural population which is in concordance other studies from Madhya Pradesh and Karnataka.^[19,26] This could be due to low socio-economic conditions and Literacy rates prevailing in rural areas.

Hookworm (both *Ankylostoma duodenale* and *Necator Americans*) was the most common isolate, (35, 31.25%), followed by *Hymenolepis nana* (25, 22.32%) in this study, while other studies showed either *Entamoeba histolytica* or *Giardia lamblia* as the commonest isolates.^[4,17,18,19,20,21]

This study showed ten cases (9.80%) of mixed parasitic infection, which was in concordance with study at Bihar.^[7] Few studies showed high prevalence of mixed parasitic infection,^[28] while others showed low prevalence.^[4,20]

CONCLUSION

Prevalence of Intestinal parasites is 15.86% in Moradabad district in Western Uttar Pradesh because of it being the industrial city, low literacy rate, improper drinking water supply, low socio-economic status and poor sanitation in the rural areas *Entamoeba histolytica* or *Giardia lamblia* most common intestinal parasites in most places, but this study shows Hookworm and *Hymenolepis nana* as the commonest isolates, which reflects the habit of defecation in open places and lack of awareness among people. It is of immense importance to accurately diagnose the infestation case as treatment differs for different groups.

Further research on pattern of zoonotic parasites found in animals at different places, therapeutic efficacy of different drugs in treatment of different

groups of parasites, presence of asymptomatic intestinal parasitic infection in random people not visiting OPD will help make the results more applicable to general population. Research on hygiene habits of different age groups and occupation in relation to intestinal parasitic infection will help better direct awareness programmes.

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