A Prevalence Study of Intestinal Parasites Infestation among Patients Attending HIMS Hospital, Located in South East Uttar Pradesh, India

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ABSTRACT

Introduction: Parasitic infections are a serious public health problem in most of the regions of the world especially in developing countries, including India. This study determines the prevalence of Intestinal parasites in HIMS hospital at Varanasi.

Materials & Methods: In this study, total 662 stool samples received in Department of Microbiology were processed, examined and analyzed for ova/cyst/ Trophozoites of parasites within a period of 6 months i.e. from January 2017 to June 2017.

Results: Out of the total 662 samples parasitic infections Prevalence was 26.58%. Helminthes were 78.40% (Ascaris lumbricoides being common) and Protozoal cysts or trophozoites were 21.59% (Entamoeba histolytica being common) in positive samples. Also parasitic infection predominance was seen in female and 1-10 years age groups.

INTRODUCTION

Parasitic infections cause a tremendous burden of disease in both the tropics and sub-tropics as well as in more temperate climates and mostly occur where there is poverty and poor sanitation. Also parasitic infections inflict considerable morbidity and mortality, though entirely preventable.1

High prevalence of parasitic infections may be due to one of the risk factors which may be low levels of environmental sanitation, lack of safe water supply, poor hygiene, low socio economic status, poverty, improper garbage disposal and impoverished health services.

Helminths such as Ascaris lumbricoides, hookworm, Trichuris trichiura, Enterobius vermicularis and Protozoa Entamoeba histolytica and Giardia lamblia are some of the common intestinal parasites responsible for considerable morbidity in young and adult population.2

The Acquisition of intestinal parasitic infection may be by ingestion, inhalation or penetration of skin by infective forms. There is no direct person-to-person transmission. Re-infection occurs only as a result of contact with infective stages in the environment and their high incidence is closely correlated to poverty and poor environmental hygiene.3

Parasitic infections impair the nutritional status of the people. Morbidity is related to the number of worms harbored. People with light infections usually have no symptoms. Heavier infections can cause a range of symptoms including intestinal manifestations (diarrhoea and abdominal pain), general malaise and weakness, impaired cognitive and physical development.4

The commonest parasitic infections reported globally are Ascaris (20%), Hookworm (14%), Trichuris trichiura (10%), and Entamoeba histolytica (10%).5 In India overall prevalence rates range from 12.5% to 66%, with varying prevalence rates for individual parasites.6-9 The purpose of this study was to find out the prevalence and to procure an accurate understanding of intestinal parasitic infection burden in particular geographical landscape (South East, Uttar Pradesh).Our study is also important as they provide basic prevalence data helping the clinicians in the diagnosis and management of the patients leading to control of parasitic infection in future.

MATERIALS AND METHODS

Study Area
The study was carried out at Department of Microbiology, Heritage Institute of Medical Sciences Varanasi, South East Zone of Uttar Pradesh.

Study Population
A total of 662 stool samples of patients (outdoor and indoor) between the age group 0 to 70 years were collected between the period of January 2017- June 2017.

Conclusion: The analyzed results help in formulating and implementing prevention strategies in this particular region.

Keywords: Public Health Problem, Intestinal Parasites, Helminthes, Protozoa, Stool Specimen.

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Study Period
Study period was around 6 months from January 2017 to June 2017.

Collection and Processing of Specimens
The patients were provided with dry, wide mouthed clean plastic container for collection of samples. Around 5 grams of solid or 10 ml of liquid stool was collected and were examined within 1-2 hours of collection. Macroscopic examination was done to look for structures like proglottids, scolecies, adult tapeworm, round worm or hookworm. The samples were examined microscopically for ova and cysts of parasites using saline and iodine mounts on grease-free slides preparation examined under 100x and 400x magnifications.

Protozoa and helminthes were identified according to morphological details. Nonpathogenic cysts were not included as positives. Repeat sample from same patients were not included in study.10

Table 1: Prevalence of intestinal parasite

<table>
<thead>
<tr>
<th>Result</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>176</td>
<td>26.58</td>
</tr>
<tr>
<td>Not infected</td>
<td>486</td>
<td>73.42</td>
</tr>
<tr>
<td>Total</td>
<td>662</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Distribution of parasites among infected samples.

<table>
<thead>
<tr>
<th>Number (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Helminths</td>
<td></td>
</tr>
<tr>
<td>A. lumbricoides</td>
<td>75 (42.61%)</td>
</tr>
<tr>
<td>Hookworm</td>
<td>59 (33.52%)</td>
</tr>
<tr>
<td>T. sp.</td>
<td>4 (2.27%)</td>
</tr>
<tr>
<td>Protozoa</td>
<td></td>
</tr>
<tr>
<td>E. histolytica</td>
<td>27 (15.34%)</td>
</tr>
<tr>
<td>G. lamblia</td>
<td>11 (6.25%)</td>
</tr>
<tr>
<td>Total</td>
<td>176 (26.58%)</td>
</tr>
</tbody>
</table>

RESULTS

Present study was conducted to find out the prevalence and to procure an accurate understanding of intestinal parasitic infection burden in particular geographical landscape (South East, Uttar Pradesh). A total of 662 samples was taken and examined out of which 176 were positive for protozoal or helminthic infection with a prevalence rate of 26.58% (Table 1).

Cyst and trophozoites of protozoa were found in 38 (21.59%) while eggs of helminthes were found in 138 (78.40%) of positive samples (Fig 1).

Among all the parasites which was identified A. lumbricoides was commonest 75 (42.61 %) followed by Hookworm 59 (33.52%), T. sp. 4 (2.27%) E. histolytica 27 (15.43%) and G. lamblia 11 (6.25%). (Table 2)

In protozoal infection E. histolytica was commonest accounting for 27 (71.05%) followed by G. lamblia 11 (28.94%). It was noticed that females were the commonest group 33.33% as compare to males which was 22.19%. (Table 3)

Parasitic infection was more common in age group of 1-10 years (23.29%) followed by age group of >70 (13.06%), 20-30 (11.36%), 30-40 (11.93%), and lowest infection was seen in age group of 40-50 years (7.94%). (Table 4)

Table 3: Gender wise distribution of parasitic infection.

<table>
<thead>
<tr>
<th>Sex</th>
<th>Total No. of sample</th>
<th>No. of positive sample (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>401</td>
<td>89 (22.19%)</td>
</tr>
<tr>
<td>Female</td>
<td>261</td>
<td>87 (33.33%)</td>
</tr>
<tr>
<td></td>
<td>662</td>
<td>176 (26.58%)</td>
</tr>
</tbody>
</table>

Table 4: Age based prevalence of intestinal parasite.

<table>
<thead>
<tr>
<th>Age group (Year)</th>
<th>Total Stool sample examined (662)</th>
<th>Positive Stool sample (176) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1</td>
<td>7</td>
<td>0 (0.0)</td>
</tr>
<tr>
<td>1-10</td>
<td>168</td>
<td>41 (23.29)</td>
</tr>
<tr>
<td>10-20</td>
<td>120</td>
<td>20 (11.36)</td>
</tr>
<tr>
<td>20-30</td>
<td>88</td>
<td>21 (11.93)</td>
</tr>
<tr>
<td>30-40</td>
<td>75</td>
<td>21 (11.93)</td>
</tr>
<tr>
<td>40-50</td>
<td>56</td>
<td>14 (7.94)</td>
</tr>
<tr>
<td>50-60</td>
<td>57</td>
<td>20 (11.36)</td>
</tr>
<tr>
<td>60-70</td>
<td>37</td>
<td>16 (9.09)</td>
</tr>
<tr>
<td>&gt;70</td>
<td>54</td>
<td>23 (13.06)</td>
</tr>
</tbody>
</table>
DISCUSSION

Human parasitic infection is a global problem of enormous proportion with wide variation in intestinal parasite from region to region; different geographic areas, communities and ethnic groups even seasonal variation are also known. Knowledge of the distribution and extent of Intestinal parasitic infection in a given population is a prerequisite for planning and evaluating intervention program. The primary aim of this study was to know the burden of intestinal parasitic infection among the patients presenting with the symptoms suggestive of such infection in a rural tertiary care hospital. In the developing world intestinal parasitic infection is still an important cause of morbidity and mortality. The present study results showed the occurrence of several intestinal parasites of public health importance in people residing in this area.

Out of the total 662 samples examined during the study, 176 (26.58%) samples were found to be positive for parasites. The prevalence percentage was comparable with those of Parameshwara rappa et al., (27.6%)13, Marothi et al., (21.4%)14, lower when compared to findings of Prakash et al., (38.1%)10, Rao et al., (59.5%)16 and while it was more than the findings reported by Beena Jad et al. (7.8%)17, Rajvir Singh et al. (6.7%)18 and Davane et al. (6.63%)19, Sethi et al., (7.3-15.5%)20, Khurana et al., (14.6%)21, and Tarana Singh et al. (13.9%).22 This may be probably due to difference in time, place and methods of examination used.

In the present study, it was observed that prevalence of intestinal parasitic infection was seen more among females (33.33 %) than the males (20.19%). Similar pattern was obtained in a study from Uttarkhand of Rajvir Singh et al.,18, Swapna K et23. The reason behind it may be, in addition to household work women’s are more exposed to contaminated soil and water due to handling of livestock and field works than Men. The prevalence of helminthic parasites was higher than that of protozoal infection and A. lumbricoides was the commonest; findings being in confirmation with the observations made by several other workers(Hedge and Patel24, 1968; Chandrasekhar and Nagesh25, 2003; Nagaraj et al.26, 2004). The prevalence of hookworm in this area seems to be much lower than that reported from Southern India where it is 61.5% (Kang, 1998).27 Prevalence of other helminths such as, Taenia spp.is low (2.27%). Among the protozoal infection - E. histolytica was the commonest intestinal parasite isolated which is comparable to the study from Bombay (Patel, 1986).28 High prevalence has also been noted from Malaysia (21%) (Nor et al., 2003).29 Other studies (Chandrashekhar et al.20, 2005; Nagaraj et al.29, 2004), however, have reported Giardia to be the commonest parasite, which appeared to occur in low percentage of patients (3.9%) here. High prevalence of helminthic infection in our study population may be attributed to their prevailing low living standards, lack of knowledge about personal hygiene, poor sanitation, open defecation and lack of proper sewage disposal leading to soil contamination and high endemicity of intestinal helminths. If the age factor is considered, highest percentage of cases in our study were in 1- 10 years (23.29%) & > 70 years (13.06%) next to it. Swapna K et al from Uttarakhand have also found similar pattern. This can be attributed to lesser immunity young children and old age. Also other risk factors may be overcrowding, more outdoor activity and exposure to contaminated surroundings.

CONCLUSION

To conclude, parasitic diseases are still common and responsible for mild but chronic morbidity. To overcome this prevailing health problem of the country, it requires multidisciplinary effort. This study emphasizes the need for health programmes and health education, provision for good sanitation, personal hygiene awareness and safe drinking water facility in addition to specific approach to prevent and control intestinal parasitic infections.

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