PREVALENCE OF INTESTINAL PARASITIC INFECTION AMONG SCHOOL GOING CHILDREN IN KARAIKAL

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ABSTRACT

To determine the intestinal parasitic prevalence in school going children from a rural and urban community.

Methods: A total of 372 stool samples were examined microscopically to identify the infecting parasites and a structured Performa was used to collect data regarding socio-economic and Personal hygiene details. Results: A total of 372 samples analyzed revealed an overall prevalence of 30.64% of which rural area had a higher prevalence of 54.54% on contrary to urban which had 38.82%). Personal hygiene and proper defecation practices were statistically significant factors in preventing parasitic infections. Conclusion: Ankylostoma duodenale and Strongyloides stercoralis infection were prevalent in rural & urban school children respectively. The study was carried during the year 2015. This study concluded the poor personal hygiene in the school going children resulting in the heavy worm burden and malnutrition in the rural population.

Key Words: Intestinal parasites A. duodenale, S. stercoralis, sanitation, personal hygiene.

INTRODUCTION

Intestinal parasitic infections are ubiquitous in developing countries with wide range of prevalence, ranging from (2.5 % to 91%)¹-² and parasitism.¹, ², 4, 5, 6, 7, 8, 9, 10 This is attributed to the prevailing socio economic, cultural, dietary & sanitation factors. Prevalence is higher in rural areas than in urban regions.¹
Our study aims at determining the point prevalence of intestinal parasitic infection in children attending primary schools at rural and urban location in Karaikal region located in Puducherry union territory.

MATERIALS AND METHODS:

Karaikal is a part of Puducherry Union Territory with a population of 200,134 (2011 Censes) and a density of 1,252/ sq.km. Two primary schools, one located in the urban region and another in the rural region was selected for the study. Parents and school authorities were explained regarding the need and importance of the study. A structured proforma was used to collect details regarding the maternal education, housing facility, source of drinking water, personal hygiene and defecation practices. Labelled stool containers were issued to the parents and they were instructed to return them the following day with their ward’s stool sample.

On receiving the samples they were immediately sent to the laboratory and examined microscopically.

RESULTS:

A total number of 372 samples were collected of which, 136 were from the rural and 236 were from urban school. In the study group 188 were boys and 184 were girls. Among the samples collected, 48 (35.2%) from the rural school and 66 (27.96%) from the urban school were positive for intestinal parasites (Table 1). Six samples from rural school and fourteen from the urban school had more than one parasite.

<table>
<thead>
<tr>
<th>School</th>
<th>Demography</th>
<th>Samples</th>
<th>Positive</th>
<th>Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>40 (30)</td>
<td>48(18)</td>
<td>136</td>
<td>48</td>
</tr>
<tr>
<td>Urban</td>
<td>86(32)</td>
<td>84(34)</td>
<td>236</td>
<td>66</td>
</tr>
<tr>
<td>Total</td>
<td>188</td>
<td>184</td>
<td>372</td>
<td>114</td>
</tr>
</tbody>
</table>

* Value in brackets indicates positive subjects

Among 48 positive samples from the rural school 58 parasites were observed and of 66 samples from urban school 82 parasites were identified. The commonest protozoan parasite both in rural and urban schools was Giardia lamblia, whereas, commonest helminth was Ancylostoma duodenale. Exceptionally-urban schools had a high prevalence of Strongyloides stercoralis.

Other parasites identified include Hymenolepis nana, Entamodea histolytica, Taenia spp, Enterobius vermicularis, and Trichuris trichura. (Table II). All the parasites were detected from both the schools but for Trichuris which was restricted to rural school.

TABLE - II
PARASITE DISTRIBUTION IN THE STUDY AREAS

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Rural School</th>
<th>Urban School</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROTOZOAAN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Giardia Lamblia</td>
<td>16</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>E.histolytics</td>
<td>2</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td>HELMINTHES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancylostoma duodenale</td>
<td>20</td>
<td>18</td>
<td>38</td>
</tr>
<tr>
<td>Taenia spp.</td>
<td>4</td>
<td>22</td>
<td>26</td>
</tr>
<tr>
<td>Strongyloides stercoralis</td>
<td>4</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Taenia spp</td>
<td>4</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Enterobius Vermicularis</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Hymenolepis nana</td>
<td>6</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Trichuris trichura</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
</tbody>
</table>

POLYPARASITISM

A total number of 20 samples exhibited polyparasitism, of which 6 were from rural school and 14 were from urban school. In the former H. nana and Strongyloides stercoralis in the latter were the commonest parasites associated with polyparasitism, Enterobius vermicularis and Trichuris trichura were not associated with polyparasitism.

Data analysed with regards to defecation practices (p Value 0.0086) and cleanliness i.e; proper trimming of nails (P value 0.0171) were significant statistically irrespective of rural or urban background. Other factors namely maternal education, type of housing, drinking water source and washing hands after defecation were not statistically significant.

DISCUSSION

In the present study parasitic infection was seen in 30.64% of the total 372 samples collected. Studies from various parts of India have reported parasitic prevalence ranging from 12.5% to 91%\(^1,2\). On further analysis, of the 372 subjects, 186 were boys and 184 were girls. Parasitic prevalence was almost similar in both sexes. However, rural children had a higher prevalence (54.54%) than urban children 38.82%. A higher rate of prevalence had been documented in other studies especially in rural areas\(^2,14\). A notable exception was high prevalence rate among rural boys i.e; 75% was observed in our study. This is considerably lower than other study which quotes 91%\(^2\) in rural areas. The common age group affected was between 5-9 years in both groups.

Various parasites identified in both groups (rural & urban) include Ankylostama duodenale 33.33%, Giardia lamblia 26.31% Strongyloides stercoralis 22.80% H. nana 7.01%, Entamoeba histolytica 12.28%, Taenia spp 12.28%, Enterobius vermicularis 7.01% and Trichuris trichura 1.75%. This pattern is unique where strongyloides is commonly identified in our study which was not in others. Many studies reveal various parasites as their leading causative agents viz. Giardia\(^4\) Ascaris, Giardia\(^16\) Ascaris, Trichuris\(^2,5,10\) E. histolytica, Giardia with minimal Ankylostoma\(^6,8\) Ascaris & Trichuris trichural, Necator americanus\(^8\) H. nand).\(^9,11,12,13\) Also we have not had even a single sample with ascaris which was seen commonly in some studies.\(^2,5,7,10\)
In rural children Ancylostoma duodenale & Giardia lamblia were the most common parasites identified whereas in the urban children it was strongyloides stercoralis and Ancylostoma. The exact reason for this pattern is unknown. This is one of the rare findings in our country to have strongyloides as leading cause of parasitic infection in children. A study from south India described a 3.2% prevalence of strongyloides and a report submitted to WHO in the year 1985 from Karaikal region indicated prevalence of strongyloides to be 2.1%\(^1\) After a span of two and a half decades it appears the prevalence rate of strongyloides has considerably increased.

Strongyloides has a high endemic percentage in south east Asia.\(^2\) Its global prevalence is estimated to be 40% in certain areas where suitably moist soil & improper disposal of human waste co-exist.\(^2\) Infection most frequently occurs in childhood\(^2\) and risk factors include malabsorption, diabetes mellitus, chronic alcoholism and use of H\(_2\) blockers.\(^2\) Strongyloides have the ability to persist & replicate within the host for decades while producing minimal / no symptoms.

Considering the increasing prevalence pattern of strongyloides, with other risk factors such as malnutrition in children and early onset of diabetes mellitus. This issue needs to be addressed adequately keeping in mind the health perspective of future generation.

India had around 50.8 million diabetics in 2010\(^2\) and alarmingly the age of onset of the disease has considerably reduced to post pubertal children. The frequency of strongyloides infection was higher in diabetics than in non-diabetics especially when Hb A1C was > 7, or when the immune system was compromised due to an underlying disease / treatment with immunosuppressive agents.

As India tends to lead the world diabetic population within a decade and strongyloides tend to the more common in these people, this study can be considered as an early call to plan & execute more stringent methods to diagnose\(^2\) and clear strongyloides stercoralis in fee lion.

Polyparasitism was noted both the rural & urban areas. In spite of A: duodenale being the commonest parasite in rural area the associated parasite was H nana, in the rural area, and in the urban area it was Strongyloides stercoralis;

The prevalence of Ancylostoma duodenale in rural and Strongyloides stercoralis in the urban area were noted to be dominant. This is with special reference to Strongyloides stercoralis, especially, in our ethnic origin, where, there children are at increased risk of developing diabetes mellitus in the years to come.

**CONCLUSION:**

The study reveals parasitic infections are prevalent in our area among school children. We emphasise the need of health education, proper sanitation and improved personal hygiene to reduce the rate of infection. The limitation of the study was, it had been confined only to two schools. A more wider population coverage may reveal the hidden facts and figures pertaining to intestinal parasitic infections in the region.
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