Parasitological Studies on Some Intestinal Parasites in primary school Children in Aswan Governorate Egypt

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This cross sectional study was done in aswan Governorate to determine the prevalence of intestinal parasites and to identify the risk factors for infection in primary school children in this geographical area. The results will facilitate evaluation of the endemic level of different intestinal parasites and the determination of whether widespread or focal measures of parasite control are required. After obtaining official permission from the school administration, information and consent forms were prepared and given to the parents of all the study participants. three-hundreds children aged between 6-12 year were enrolled; a detailed questionnaire, complete clinical assessment complete as well as stool analysis was done The study revealed that Prevalence of parasitic infection was 31%. Single parasitic infection in 26% and mixed infection in 5%.The commonest helminthic infection was. E vermicularis 6.6% followed by H.nana 3% Ascaris 1%. The commonest protozol infection was E.histolytica 8.3% followed by Giardia 3.7% and Cryptosporidium 1.7% Mixed infection was in form of E vermicularis plus E.histolytica in 23.4%, E vermicularis plus Giardia in 17.6%, E vermicularis plus Cryptosporidium in 11.8%, E.histolytica plus H nana in 11.85%, Ascaris plus E. histolytica in 17.6%, Giardia plus E. histolytica in 11.8%. Parasitic infestation was more prevalent in boys 53.8% than girls 46.2%. Parasitic infestation was more prevalent in rural children 39.73% than urban children 20.13%. Age ranged from 6 to 12 years with a mean of 8.97±1.72 years.

Keywords: Egypt, Aswan, school-children, Intestinal Parasites, rural ,urban

INTRODUCTION

Intestinal parasitic infection are amongst the most common infection world wide It is estimated that3-5 billion people are affected , and that 450 million are ill as a result of these infection. The majority bening children .these infections as regarded as serious public health problem. they cause iron deficiency anaemia, growth retardation in children and other physical and mental problems (WHO 1998)

-The high prevalence of these infections is closely correlated with poverty, poor environmental hygiene and poor health services. The fecal oral route significant in the transmission of parasitic infections to human via poor personal hygiene and environmental condition such as

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contaminated soil and water sources Nxasona et al., (2013).
- it is important to measure their prevalence and identify
the predisposing factors to infection as the first step for
monitoring the progress of control efforts and for
formulation of future intervention strategies (Hassan,
1994.)
-Due to lack of available studies on the intestinal parasitic
infection in children in Aswan Governorate, the present
study is planned to monitor the intestinal parasitic infection
among urban and rural primary school children in Aswan
Governorate.

Subjects, Materials and Methods

This is a descriptive study carried out in Aswan
Governorate during the period from October 2015 to March
2016. School children in four governmental primary schools
in Aswan Governorate from both urban and rural . Random
sample consist from Three hundred (300) child were
included in the study. Their ages arranged from 6 to 12
years. One hundred and seventy (170) of them were males
and one hundred and thirty (130) were females. An initial
visit was carried out to each school. The aim of the study
was discussed with the personnel in change. A consent
was taken from ministry of education and from national
security office. Every child was subjected to a
questionnaire about symptoms and signs suggestive of
parasitic infection. The children were subjected to Careful
history taking with special stress on symptoms suggestive
of parasitic infection. General and/abdominal examination.
as well as Stool examination by: Direct smear method
Garcia and Bruckner, (1988).,Formol –ether
concenteration technique Ritchie, (1948).,Special stains for
diagnosis of intestinal protozoa, Modified Ziehl-Neelsen
staining Casemore et al., (1985).,Kato-Katz technique
(cellophane fecal thick smear) Katz et al., (1972). And
Adhesive: cellophane tape .Jacobs(1942); Peri anal swab
was done for those who gave history of perianal
itching..The statistical analyses of the results were
computed by means of a statistical analysis software
package “Microstat”, copyright of Ecosoft Inc. Data was
collected, tabulated and statistically analyzed with SPSS
version 9 statistical program comparison between studied
groups was done using chi-square test (X2) at 5% level of
significance. Chi-square test To test the significance
of difference between frequency of different observation , chi
square test was used

RESULTS AND DISCUSSION

In the present study, we aimed to determine the
prevalence of intestinal parasites in children between (6-
12) years living in Aswan town, Aswan Governorate was
30%. This was in agreement with Ibrahim (2011) who
reported that the prevalence of parasitic infection among
Egyptian school children in El- Minia Governorate village
in upper Egypt was 29.3%, and to Hassinan et al(2014)
who reported that the prevalence of parasitic infection
among school children in Zifta City Gharbia Governorate
was 31% and to Attia. (2004). Who reported that
prevalence of parasitic infection among school children in
Tala City Menofiya Governorate was 28.20. However our
result was less than that reported in El- Morsy et al.,(2007)
who reported that prevalence of parasitic infection among
school children in Sohag Governorate were 60.20% in
urban area and 88.5% in rural area and to Hegazy et al.,
(2014) who reported that prevalence of parasitic infection
among school children in Damanhur City were 51.8% and
less than that reported in Omran et al., (2013) who
reported that prevalence of parasitic infection among
school children in Zewan Shorqia village Sohag
Governorate was 55%.

In the present work age ranged from (6 to 12 years) with
mean of (8.97±1.72) this agrees with Quinhui et al.,(2006)
who reported that, the school children had average age of
(8.2 + 1.4) and to (Karim., et al.,( 2013) who reported that
mean age was (7.45 ± 0.87) years. And disagree with
Okayay et al.,( 2004) reported that mean age was (10.51±
2.33) for boys and (10.34±2.77) for girls, and both age are
higher than that reported in the present work. This may be
due to different inclusion criteria and different sample size.
As regards distributions of intestinal parasites in studied
children regarding to age, we found that E.histolytica,
Giardia and mixed infection (27.90%, 13.95 and 27.90%)
respectively. More in older ages compared to younger
ages (27.6%, 10.63% and 10.63) and (H.nana, Ascaris
lumbricoids, E.vermicularis and cryptosporidium) more in
younger ages (12.76%, 4.25% and 27.65 and 6.38%)
respectively compared to older ages (6.9%, 2.32%,
16.27% and 4.65%).This agree with Abd El -Aziz
et al.,(2012) who reported that E. histolytic occasioned in older and
E vermicularis occurred in younger ages.

And disagree with Amuta et al., (2009) who reported no
significance difference in infection rate between age
groups as helminthes infection recorded among all age
groups.

As regards sex distribution, our finding revealed that
males were more & susceptible to infection (15.66) than
females (14.33) this finding is in agreement with Amuta
et al., (2009) who reported that infection was more in male
children (53.33) than females (46.66%), and to Al Hindin ( 2002)
who reported higher prevalence of infection among
male (48%) as compared to (27.8%) in females, and to
Hegazy et al., (2014) who reported that prevalence of
infection among male (52.1%) as compared to (47.9%) in
females . And to Omran et al.,( 2013) who reported parasitic infection in male was (58.38) in compared to
Table 1: Prevalence of intestinal parasites among studied children

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infected</td>
<td>90</td>
<td>30</td>
</tr>
<tr>
<td>Non Infected</td>
<td>210</td>
<td>70</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 2: Frequency of different intestinal parasites among school children

<table>
<thead>
<tr>
<th></th>
<th>No (300)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. vermicularis</em></td>
<td>20</td>
<td>6.6</td>
</tr>
<tr>
<td><em>Ascaris lumbricoid</em></td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td><em>H. nana</em></td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td>Mixed infection</td>
<td>17</td>
<td>5.6</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1.0</td>
</tr>
<tr>
<td></td>
<td>25</td>
<td>8.3</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>3.7</td>
</tr>
<tr>
<td><em>Cryptosporidium</em></td>
<td>5</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Table 3: Pattern of mixed parasitic infection

<table>
<thead>
<tr>
<th>Mixed infection</th>
<th>No (17)</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>E. vermicularis</em> + <em>E. histolytica</em></td>
<td>4</td>
<td>23.4</td>
</tr>
<tr>
<td><em>E. vermicularis</em> + Giardia</td>
<td>3</td>
<td>17.6</td>
</tr>
<tr>
<td><em>E. vermicularis</em> + cryptosporidium</td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td><em>E. histolytica</em> + giardia</td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td><em>H. nana</em> + <em>E. histolytica</em></td>
<td>2</td>
<td>11.8</td>
</tr>
<tr>
<td><em>Ascaris</em> + <em>E. histolytica</em></td>
<td>3</td>
<td>17.6</td>
</tr>
</tbody>
</table>

Table 4: Incidence of single and mixed parasitic infection among studied children

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>73</td>
<td>24.2</td>
</tr>
<tr>
<td>Mixed</td>
<td>17</td>
<td>5.6</td>
</tr>
</tbody>
</table>
Table 5: Clinical symptoms and signs among infected and non infected children

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Infected (n=90)</th>
<th>Non infected (n=210)</th>
<th>Total (n=300)</th>
<th>Chi-square test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no %</td>
<td>No %</td>
<td>no %</td>
<td></td>
</tr>
<tr>
<td>Recurrent Abd. pain</td>
<td>63 70.0</td>
<td>20 9.5</td>
<td>83 27.6</td>
<td>10.6 &lt;0.001**</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3 3.3</td>
<td>0 0.5</td>
<td>0 1</td>
<td>2.03 0.043*</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>30 33.3</td>
<td>4 1.9</td>
<td>134 11.3</td>
<td>7.7 &lt;0.001**</td>
</tr>
<tr>
<td>Pallor</td>
<td>50 55.5</td>
<td>22 10.4</td>
<td>72 24</td>
<td>8.2 &lt;0.001**</td>
</tr>
<tr>
<td>Perineal itching</td>
<td>30 33.3</td>
<td>3 1.4</td>
<td>33 11</td>
<td>7.9 &lt;0.001**</td>
</tr>
</tbody>
</table>

* Statistically significant difference (p<0.05)
** Statistically significant difference (p<0.01)

Table 6: Distribution of intestinal parasites in infected children regarding to sex

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Males N= 47</th>
<th>Female N= 43</th>
<th>Both (90)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E.histolytica</td>
<td>10 (21.2%)</td>
<td>15 (34.88)</td>
<td>25 (27.7%)</td>
<td>0.228</td>
</tr>
<tr>
<td>Giardia</td>
<td>8 (17.02%)</td>
<td>3 (6.9%)</td>
<td>12 (13%)</td>
<td>0.258</td>
</tr>
<tr>
<td>H. nana</td>
<td>6 (12.67)</td>
<td>3 (6.9%)</td>
<td>9 (10%)</td>
<td>0.574</td>
</tr>
<tr>
<td>Ascaris</td>
<td>2 (4.25)</td>
<td>1 (2.3)</td>
<td>3 (3.3)</td>
<td>0.937</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>2 (4.25)</td>
<td>3 (6.9)</td>
<td>5 (5.5)</td>
<td>0.918</td>
</tr>
<tr>
<td>E.vermicularis</td>
<td>8 (17.02)</td>
<td>12 (27.90)</td>
<td>20 (22)</td>
<td>0.324</td>
</tr>
<tr>
<td>Mixed infection</td>
<td>11 (23.40)</td>
<td>6 (13.95)</td>
<td>17 (18.8)</td>
<td>0.382</td>
</tr>
</tbody>
</table>

Table 7: Distribution of intestinal parasite in infected children regarding to Age

<table>
<thead>
<tr>
<th>Parasite</th>
<th>6-9 years N= 47</th>
<th>9-12 years N= 43</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. histolytica</td>
<td>13 27.65</td>
<td>12 27.90</td>
<td>0.834</td>
</tr>
<tr>
<td>Giardia lamblia</td>
<td>5 10.63</td>
<td>6 13.95</td>
<td>0.875</td>
</tr>
<tr>
<td>H.nana</td>
<td>6 12.76</td>
<td>3 6.97</td>
<td>0.574</td>
</tr>
<tr>
<td>Ascaris lumbercoids</td>
<td>2 4.255</td>
<td>1 2.32</td>
<td>0.937</td>
</tr>
<tr>
<td>E.vermicularis</td>
<td>13 27.65</td>
<td>7 16.27</td>
<td>0.297</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>3 6.38</td>
<td>2 4.65</td>
<td>0.918</td>
</tr>
<tr>
<td>Mixed infection</td>
<td>5 10.63</td>
<td>12 27.90</td>
<td>0.069</td>
</tr>
</tbody>
</table>
### Table 8: Rural and urban distribution of intestinal parasites in infected children

<table>
<thead>
<tr>
<th></th>
<th>Rural (N= 60)</th>
<th>Urban (N=30)</th>
<th>Total (N= 90)</th>
<th>P. value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>E.histolytica</td>
<td>17</td>
<td>28.2</td>
<td>8</td>
<td>26.7</td>
</tr>
<tr>
<td>Giardia</td>
<td>8</td>
<td>13.3</td>
<td>3</td>
<td>10.0</td>
</tr>
<tr>
<td>H.nana</td>
<td>5</td>
<td>8.3</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Ascaris</td>
<td>2</td>
<td>3.3</td>
<td>1</td>
<td>3.3</td>
</tr>
<tr>
<td>E.vermicularis</td>
<td>13</td>
<td>21.7</td>
<td>7</td>
<td>23.3</td>
</tr>
<tr>
<td>Cryptosporidium</td>
<td>3</td>
<td>5.0</td>
<td>2</td>
<td>6.6</td>
</tr>
<tr>
<td>Mixed infection</td>
<td>12</td>
<td>20.0</td>
<td>5</td>
<td>16.7</td>
</tr>
</tbody>
</table>

(51.38) in females. And to Ulukanligil and Seyrek (2004) showed more affection of males (57.2%) than girls (42.7%). The difference be attributed a activity of males than females. But this result is not in agreement with (Nimri and Megdam., 2004) who suggested that the low immunity of females may account for higher prevalence in male than females.

As regards the distribution of intestinal parasites in studied children regarding to sex, 1-we found that females were more affected with *(E. histolytica, E. vermicularis and cryptosporidium)* (34.88, 27.90 and 6.9%) respectively than males (21.2%, 17.02 and 4.25%) while male were more affected with *Giardia, H.nana, Ascaris lumbericoids and mixed infection* (17.02, 12.76, 4.25 and 23.40) respectively than females (6.9%, 6.9% 2.3% and 13.95%) with no significant difference. These results were in agreement with Hassanein et al., (2014) who reported that infection with *(E. histolytica, E.vermicularis)* more in females (25.6%, 23.9%) respectively than males (17%, 23%). While males were more affected with *giardia, H.nana and mixed infection* (21%, 9% and 21%) respectively than females (14%, 8.1 and 10.50%). This results is in agreement with Amira et al., (2012) who reported that infection with *E. histolytica* was higher in females than males. And to Oluwafemi, (2003) who reported that infection with *E.histolytica* was higher in females than male.

As regards residence, we found that the majority of infected children were living in rural areas (60%) with significance difference (P. Value). This results in agreement with Hassanein et al., (2014) who reported that prevalence of parasitic infection in rural area was 66.1% and in urban area was 33.6% and to Fernandez et al., (2002) who reported that highest prevalence of parasitic infection 91% in school children was reported in rural areas in south india and to Hany et al., (2006) who reported that the prevalence of parasitic infections among rural children was found significantly higher than that or urban children (89% and 58% respectively. This may be due to in rural communities in Egypt, human faeces are often used as agricultural fertilizer and warm climate, humid atmosphere, muddy nature of soil and consumption of large quantities of raw vegetables, without washing. Also, there is no central sewage disposal system or home aseptic tanks and even if water is used for drinking and coming in some village, water from Nile is commonly used for washing, bathing and these sociocultural habits are difficult to be changed all factors helps in transmission of parasitic infection. On international level Egger et al., (1990) reported a high prevalence of parasitic infection among rural children in Thailand. This could be explained by similarity of sanitary and hygienic condition in both Egypt and Thailand.

### CONCLUSIONS

Intestinal parasitic infection is an important public health problem in students between 6-12years living in Aswan City, Aswan Governorate with Prevalence rate (31.0%). Rural residence was significant association with parasitic infection. Both sexes were affected and males were more affected with *Giardia, H.nana, Ascaris* and mixed infection while females more affected with *E.histolytica, E.vermicularis and Cryptosporidium*. Mean age of parasitic infection was (8.97±1.72)The most common type of parasitic infection was *E.histolytica* and the least one was *Ascaris*. Raising awareness about parasitic disease has very important effect in decrease prevalence of parasitic infection.

### REFERENCES

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