Research article

Prevalence of Some Selected Soil Transmitted Helminthes Infections among Patients (Children) In Nekemte Hospital Oromia, Region, Western Ethiopia.

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Abstract

Helminthes are parasitic worms, which infect humans and among these soil transmitted helminthic infections such as Ascaris lumbricoides, Hook worm and Trichuris trichuria are the most important and most prevalent human parasites which have worldwide distribution. There are some factors which contribute for the prevalence of these soil transmitted helminthic parasites, these factors includes poor handling of personal and Environmental hygiene, limited access to clean water, resistance of parasites against drugs typically in developing countries. Thus the present studies was conducted to access the prevalence of some selected soil transmitted helminthic infection such as Ascaris lumbricoides, Hook worm and Trichuris trichuria in Nekemte Hospital in 2004 up to April 2005. These investigation was mainly emphasis on data obtained from Secondary source that was obtained from Nekemte Hospital laboratory recorded data. The total patient stool samples examined from age (2-15) were 406 (200 Male and 200 Female) 2004 out of which 12.3%, 9.33% and 5.39% were infected with Ascaris lumbricoides, Hook worm and Trichuris trichuria respectively. Furthermore, the total patient stool samples examined from age (2-15) were 405 (210 Male and 195 Female) 2005 out of which 9.62%, 2.96% and 2.96% were infected with Ascaris lumbricoides, Hook worm and Trichuris trichuria respectively. According to this survey the distribution of soil transmitted helminthic infection in different age groups (2-15) were highly decreasing in 2005 than in 2004. Finally, sector that are working in health affairs have to cooperate to solve these problems in preventing, controlling the infectious and communicable disease in general and intestinal helminthes in particular. Copyright © WJNAS, all rights reserved.

Key words: Helminthes, infections, soil transmitted helminthes, intestinal parasites,
Introduction

Background of the Study

Helminthes are parasitic worms, which infect humans (maizels and yazdanbakhsh, 2003), and mainly found in two phyla; Platyhelminthes and Nematode (Hotez et al., 2008). Many different species of soil transmitted helminthes (STHs) infect humans, especially in the tropical and sub tropical parts of the developing world. However, four intestinal nematode in particular stand out because of their wide spread prevalence and distribution that results in hundreds of millions of human infections. These includes the large round worms, Ascaris lumbricoides, the whip worm, Trichuris trichuria, and two species of hook worms, Necator American's and Ancylostoma duodenale (Hotez et al., 2008). These species are collectively known as soil transmitted helminthes (STHs). Multiple infections of these parasites are common in a single individuals especially in child living in ales developed countries. Latter the infections of STHs in children would cause mal nutrition, stunting growth, intellectual retardation and cognitive and educational deficit (WHO, 2005).

Helminthes infection mostly STHs affect over one quarter of the world population (Brooker et al., 2006), of which 3000 million suffer from associated sever morbidity and about 400 million of which are a school aged children (Rodriguez-Morales et al., 2005). More than 150 million school aged children are severely affected by intestinal parasitic worms (Jukes et al., 2008). Soil transmitted helminthic infections represents a major public health problem in poor and developing countries and have constituted a universal burden which does not only depends on regional ecological conditions but also on local standards of social and economic developments of the people (Ukpai and Ugwu., 2003). Recent estimates suggests that Ascaris lumbricoide (A.lumbricoides) infect 1.221 billion people, Trichuris trichuria (T. trichuria) 795 million, and hook worms 740 million (Deselva et al., 2003). In patients with heavy worm load, parasite infection is frequently symptomatic. Clinical manifestation associated with intestinal helminthes infection includes intestinal obstruction, insomnia, vomiting, weakness and stomach pain (John et al., 2006); while the natural movements of worms and their attachment to the intestine may be generally uncomfortable for their hosts (Watkin & Pollitt, 1997). The migration of Ascaris larvae through the respiratory passageway can also lead to temporary asthma and other respiratory symptoms (John et al., 2006). STHs infection rarely causes death. Instead, the burden of the disease is related to less mortality than to the chronic and insidious effects on the hosts health and nutritional status (Stephenson et al., 2000). Hook worms have long been recognized as an important cause of intestinal bloods loss leading to iron deficiency and protein malnutrition. The iron deficiency anemia that accompanies moderate and heavy hook worm burdens is sometimes referred to as hook worm disease (Hotez et al., 2004). Because of their underlining poor iron status, children are frequently the ones most susceptible to developing hook worm anemia (Brooker et al., 2004).

Chronic STHs infections resulting from Ascaris, Trichuris, and hook worms can dramatically affect physical and mental development in children (WHO, 2002). Studies have also shown that the growth and physical fitness deficit caused by chronic STHs infections are sometimes reversible following treatment with anti-helminthic drugs (Stephen et al., 2000). The effect on growth are most profound in children with the heaviest infections, but light infection may also contribute to growth deficit if the nutritional status of the community is poor (Stephen et al., 2000).

According to the research conducted in Ejaji town, western Ethiopia among primary school children shows that the overall prevalence of intestinal parasitic helminth infection was 48.7 % (190 of 300 children). The predominant parasites involved in this study were hook worm which was observed in 123 (31.54%) of the students and Ascaris lumbercoides in 81 (20.77%) of the students followed by Trichuris trichuria in 21 (504%) of the students, Hymenolepsis nana in 6 (1.54%) Of the students and Enterobius vermicularies in 3 (0.8%) of the students (Tesfaye, 2011).
Epidemiological survey have revealed that, poor sanitation and inappropriate environmental conditions coupled with indiscriminate defecation, geography and contamination of water bodies, poor personal hygiene, sub standard housing and lack of education are the most important predisposing factors to intestinal worm infestation (Brooker et al., 2008). Stool microscopy using direct wet mount, Forml-etherconcentration techniques offers many relative advantages over other diagnostic methods for detecting intestinal parasites(Bogoch et al.,2006). Intervention against STHs infections is based on regular anti-helminthic Treatments, improved water supply, sanitation and heath education (Albonico et al.,2006).

Soil transmitted helminthes infections are major public health problem in several tropical and subtropical developing countries like Ethiopia with poor socio-economic status. This is more common in school children and is associated with high morbidity and mortality and economic loss to the country (Girum, 2005).Therefore, it is very crucial to know the effect of parasitic infections status and on the development of children. So far, there is no published information in the study area regarding the consequence of parasitic helminthic infection in children. This research is therefore, designed to study the soil transmitted helmint infections among children at different age groups in Nekemte Hospital, Western Ethiopia, in East wollega zone.

Soil transmitted helminthic infection have a worldwide distribution and constitutes a considerable public health problem, especially in developing countries (both in tropical and subtropical). It is estimated to affect about1.221 billion people globally. The majority being children in some tropical areas, the prevalence reaches nearly 10% .Intestinal helmithic infections is most common among school age children and tend to be of high intensity in this age groups, this is because of the direct contact between school age children and e contaminated soil (hand to mouth contact).Even though the prevalence of Soil transmitted helminthic infection have been studied throughout many countries by different researchers, but in Nekemte hospital it is in rare case. Thus, the statement of the problem is designed to assess, examine and find appropriate preventative solution and control measures. The overall objective of the study is to assess the prevalence’s of major STHs infections, and the risk factors among children at different age groups who will request stool examination in Nekemte Hospital.

Nowadays, the prevalence of soil transmitted infection is high in tropical and subtropical regions of the world due to environmental and socio-economic problems. So the significance of the study will be for the following; the study will be helpful to have the current status of the prevalence rate of STHs infection among children examined in Nekemte hospital and research will be used as secondary data source for future research work related to the study topic, furthermore, The outcome (result) of this research is important to create awareness on the extent of STHs infection, control and preventative methods (strategies) in general and in addition to this the study will be helpful to concentrate and distributes appropriate anti-helminthic drugs for different heath institutions based on the prevalence of helminthes isolated in the study area.

Research Methodology

Description of the Study Area
The study was conducted in Nekemte Hospital, in East Wollega zone of Oromia national regional state, the district capital .Nekemte is located about 331km from Addis Ababa, the national capital. Regarding the latitudinal range, the elevation varies from 9°55 N to 36°33 meters. The town is characterized by tropical and subtropical types of climate. The mean annual temperature ranges between 14-26°C degree Celsius where as the mean annual rain fall is between 1500 and 2200 mm (Nekemte town statistics center).

Study Design
The study design were simply taking data on parasitological surveys of some soil transmitted helminthic infections in 2004 and 2005 in Nekemte hospital west Ethiopia. Prevalence of some soil transmitted helminthes infection among children in the study areas were determined.
The Study Population
The study populations were taken from children requesting stool examination in Nekemte Hospital from 2004-2005. All children aged between 2-15 years found in hospital.

Methods of Data Collection
Secondary or retrieved data were taken from Nekemte Hospital on laboratory data 2004, may 2005 E.C.

3.4. Data analysis
After proper data collection, data were analyzed in detailed percentages; methods of analyzing were descriptive analysis. The reason for choosing this method of analyzing is that it allows describing, summarizing and presenting quantitative data. Then, the results were written in tables and percentages by classifying the patient by age and sex from 2004-2005 E.C. Finally, the analyzed data were presented in understandable ways to draw conclusion and recommendation.

<table>
<thead>
<tr>
<th>Age in year</th>
<th>Ascaris positive</th>
<th>Hook worm positive</th>
<th>Trichuris Trichuris positive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sex</td>
<td>Sex</td>
<td>Sex</td>
</tr>
<tr>
<td></td>
<td>M    F    Total</td>
<td>M    F    Total</td>
<td>M    F    Total</td>
</tr>
<tr>
<td>2-5</td>
<td>No</td>
<td>10   8   18</td>
<td>6   4   10</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>2.46</td>
<td>1.97</td>
</tr>
<tr>
<td>6-10</td>
<td>NO</td>
<td>10   4   14</td>
<td>8   6   16</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>2.46</td>
<td>0.98</td>
</tr>
<tr>
<td>11-15</td>
<td>No</td>
<td>8   5   18</td>
<td>6   8   14</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>1.97</td>
<td>2.46</td>
</tr>
<tr>
<td>Total sample(405)</td>
<td>Total %</td>
<td>6.89</td>
<td>5.41</td>
</tr>
</tbody>
</table>

Result and Discussion

Table 1. Prevalence of soil transmitted Intestinal helminthic infection in Nekemte Hospital by age, sex and percent in 2012G.C (2004 E.C) among 406 children of which male (200) and female (206).

From table 1, we can see that about 12.3%, 9.8% and 5.39% of children between 2-5, 6-10 and 11-15 age groups were infected by *Ascaris lumbricoides*, *Hook worm* and *Trichuris trichuria* respectively. If you looked at the table, in terms of age groups children between 2-10 years were highly infected by *Ascaris lumbricoides* than age groups ranging from 11-15 years.
Table 2. Prevalence of soil transmitted helminthic infection interms of age in 2013 G.C(2005E. C) in Nekemte hospital among 405 children of which male (210)and female (195).

From the total population (405) the age group 2-10 were highly infected (3.7%) by *Ascaris lumbericoides* and age group (11-15)were highly infected by hook worm (1.48%)and age group between 6-10 on the other hand were seriously affected by *Trichuris trichuria* (1.23%)when compared with other age groups.

**Discussion**

According to this study the highest prevalence of Ascaris lumbericoides were observed in the age groups 2-4 (4.43%) in 2004 than in the same ages groups in 2005(3.7%) but, this age groups were highly infected as compared to the other age .This is mainly due to the high probabilities of children around these age groups to be exposed to infection directly or indirectly by consuming contaminated soil than others and as it can be observed from the table1 the prevalence of *Ascaris lumbericoides* were decreased in age groups( 2-5) in the year 2004 from 4.43 % to 3.7% in 2005. This is mainly because of the presence of different Drug administration by different Health institutions or it could be due to awareness created by the government through different Medias and personal and environmental sanitations. In contrary, children aged between 11-15 years were moderately infected with Hook worm (3.44%) than those that were between2-10 (2.45%). This is probably because children of aged group between11-15 can move from one site to another independently as a result; they may have got a high chance to come across with hook worm infection through skin penetration if they move with barefoot. This survey were mostly higher than with survey of *Ascaris and Hook worm* that was conducted in (Ye-ebiyo, 1992), but lower than *Trichrus trichuria* that was conducted in the same year(1992).) . Of 2,078 stool samples collected in villages near micro dams in Tigray 2.3%, 2.4% and 8.95 were found to be positive for *Ascaris lumbericoides, Trichrus trichuria and Hook worms* respectively (Alemayehu Amberbir, et al., 1998).

As shown by the present study, the predominance of intestinal helmenths in different age groups (2-15) were high (12.3%, 9.33 % and 5.9%) Ascaris lumbericoides, Hook Worm and Trichuris Trichuria respectively in 2004. Similarly about 9.6%, 2.96% and 2.96% infection of Ascaris lumbericoides, Hook Worm and Trichuris Trichuria were recorded in 2005, respectively. According to research done in southern Gondar by Jamaneh Leykun in 2000, about 28.4%, 8.35 and 12.1% of the children had moderate infection of *Ascariasis trichuriasis* and Hook worm respectively (Jamaneh Leykun, 2000).
According to this survey the sex distribution of Ascaris lumbricoides, hook worms and Trichuris trichuria were varies from 6.89%, 4.91% and 3.41% to 5.41%, 4.42 and 1.96% in 2004 in Males and Female respectively. From this data we can understood that Males of different age groups were highly infected than Females by both types of Soil transmitted intestinal parasites infections (Ascaris lumbricoides, Hook worms and Trichuris Trichuria in the same year. This is mainly because males were engaged most of the time in playing outside (in dirty habitats) where the infective stages of parasites can easily hides itself under their nails as a result, the infective stages may enters to intestinal tract feco-oral transmission as compared to Females which stays most of the time in infection free sites.

On the other hand, if we looked at the prevalence of Soil transmitted intestinal parasites infections (Ascaris lumbricoides, hook worms and Trichuris trichuria in the 2005 in sex the distribution were varies from 5.18%, 2.96% and 1.48% to 4.44%, 0 % and 1.48% in 2005 in Males and Female respectively. So from these data we can generally say that in both years Males were highly infected than Females by both types of soil transmitted helminthic infections. According to this survey, Ascaris lumbricoides were the dominant Soil transmitted helminthic infections followed by Hook worm and Trichuris trichuria were the least once.

**Conclusion and Recommendation**

**Conclusion**

Although the study was conducted to look for the prevalence of Soil transmitted helminthic infections among children, study showed that the prevalence of Soil transmitted helminthic infections such as *Ascaris lumbricoides* were moderately high in Children below fifteen years when compared with the prevalence of *Hook Worms and Trichuris trichuria* in the same age groups in the two successive years. In general, the prevalence of *Ascaris lumbricoides* were high as compared to other soil transmitted intestinal protozoan parasites under investigation and thus these spreading of this communicable disease will affect the socio-economy of the community. Therefore, to solve problems related to soil transmitted intestinal protozoan parasites, the community should be participate in developing clean latrine service, Environmental sanitation, keeping personal and family hygiene.

**Recommendations**

To this end, based on the finding of this study, and other established facts the following recommendations are made.

- Using latrine to avoid contamination with fecal matter.
- Environmental Sanitation, personal and family hygiene.
- Keeping children from contaminated soil and other contaminated sites.
- Other study has to be conducted to know the factors that contribute to the prevalence of these parasites and measures that have to be taken to solve the problems.
- The health office of Zonal and other responsible Governmental and Nongovernmental Organization should have to develop awareness in the community by educating the modes of transmissions, control, prevention and its treatments clearly by using different Medias.
- Finally, sector that are working in health affairs have to cooperate to solve these problems in preventing, controlling the infectious and communicable disease in general and intestinal helminthes in particular.

**References**


