Incidence and Intensity of Soil Transmitted Helminths in A Rural Area of Lahore

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Geohelminths / Soil-Transmitted Helminths (STH) infection represents a major public health problem in poor and developing countries. During the period April and May 2002, we received 85 stool samples to detect the presence of STH infection in young children. Stool samples were examined for helminth eggs by qualitative method (Kato-Katz technique) to determine the prevalence and intensity of intestinal parasitic infection. The overall prevalence of STH infection detected was 44.7%. Ascaris lumbricoides (60.53%) was the commonest parasite isolated, followed by Trichuris trichura (42.10%). The highest incidence of infection was found in the 2 – 8 year age group. The objective of this study was to determine the prevalence and intensity of STH in children aged 1 – 15 years living in a rural area of Lahore, so as to provide data to plan helminthic control programmes.

Introduction

Intestinal parasitic and protozoan infections are amongst the most common infections world-wide. It is estimated that some 3.5 billion people are affected, and that 450 million are ill as a result of these infections, the majority being children. Each year, in the endemic areas, some 20,000 deaths are attributable to Ascaris lumbricoides (A. lumbricoides). Multiple infections with several different parasites are common, and their harmful effects are often aggravated by coexistent malnutrition or micronutrient deficiencies. According to WHO, in 2025, more than half of the population in developing countries will live in urbanized areas where Entamoeba histolytica, Giardia intestinalis, A. lumbricoides and Trichuris trichura (T. trichura) will find a favourable ground for transmission.

Geohelminths / STH remain prevalent throughout the developing world where levels of sanitation, personal hygiene ad maternal education are low. It is estimated that more than 1 billion people in the world are infected by them. The five species of nematodes responsible for the bulk of STH are A. lumbricoides, Hookworms, T. trichura and Strongyloides stercoralis. These infections most frequently affect children in developing countries and are associated with poor growth, reduced physical activity and impaired learning ability. High worm load and repeated infections affect the nutritional status of the children and cause severe anemia and chronic diarrhea. Annually about 150,000 children die due to intestinal obstruction and other abdominal complication caused by adult worms. Infection can only be definitely controlled by improvement in sanitation and living conditions and implementation of control programmes.

The observation by microscopy of nematode eggs in human faeces is used to diagnose a helminth infection, while the concentration of these eggs is used to estimate the number of worms in the host. Within a community, the prevalence of infection and egg count provide useful information about the extent of a public health problem, and are used to guide the growing efforts to control disease.

The objective of this study was to find out the prevalence and intensity of STH in children aged 1 – 15 years living in a rural area of Lahore and to provide data to plan helminthic control programmes.

Patients and Methods

A total of 85 children presenting to the Paediatric Outdoor Unit of Institute of Child Health during the period of April and May 2002, were enrolled in the study. The age group ranged from 1 – 15 years.

Containers for the collection of stool samples were provided to the parents with instructions regarding sample collection. Samples were brought back the next day and transported to Chughtai’s Lahore Lab. Kato Katz method for quantitative
estimation of helminthes was utilized for the preparation of the slides.

Results

Eighty five children attending the OPD of Institute of Child Health during April and May 2002, were tested for the presence of STH. The overall prevalence of infection was 38 (44.7%). Out of this, 21 cases (55.26%) were of single helminthic infection whereas 17 (44.73%) showed polyparasitism.

A. lumbricoides was the predominant parasite being present in 15 (39.47%) of the single infections and 8 (21.05%) of the mixed infections. T. trichura was found in 6 (15.79%) of the single infections and 10 (26.32%) of the mixed infections. One (2.63%) child had a mixed infection with A. lumbricoides and T. trichura; 7 (18.42%) had a mixed infection with A. lumbricoides and Hymenolepis nana (H. nana) whereas 9 (23.68%) had a mixed infection with T. trichura and H. nana.

More boys than girls, 24 (63.16%) as compared to 14 (36.84%), were infected. Children less than 2 years of age showed a lower prevalence of infection than those in the 2 – 8 years age group.

The intensity of infection ranged from 48 to 40,80,384 eggs/gram of faeces for ascariasis and 312 to 4200 egf for trichuriasis. Higher intensities were noted for females as compared to males. The positive cases received a full course of anti-helminthic drugs. After two weeks of stopping treatment, examination was repeated for 3 consecutive days. All cases turned out to be negative except five which showed a polyparasitism initially. However, these cases also showed a lower intensity of infection as compared to the previous results. After another 15 days repeat samples of all the negative cases were again evaluated to ensure complete eradication of the infection. All the patients sampled were negative.

Discussion

Geohelminths / STH remain prevalent throughout the developing world where levels of personal and environmental sanitation and maternal education are low.4,5

In our study, 44.7% of the children were infected with either one or more of these helminths. Similar results have been given by Easton12, Rai et al13, Zulkifli et al14 and Lindo et al15. Majority of the incidences reported in various parts of the developing world fall between 17% and 76%.6, 13, 16-18 However, both extremely high19, 20 and low incidences9, 21 have also been reported.

A. lumbricoides prevalence superceded all parasites by showing a positivity of 60.52%. This incidence is similar to those reported by Andrade et al6, Mani et al19 and Taylor et al8 in 2001-2002. However, incidences lower than 30% have been reported in many studies done in the past few years.14, 26, 22-24 The higher incidence in our areas is probably due to the prevalence of poor environmental sanitation, poor personal hygiene, and lower maternal literacy rate, especially in the lower income classes. Mixed infections were present in 55.26% of the cases with a preponderance of 2.63% for A. lumbricoides and T. trichura and 18.42% for mixed infection of A. lumbricoides and H. nana.

The incidence of T. trichura in our study was 42.10%; of these 15.79% were single infections and 26.32% mixed infections. 23.68% had a mixed infection with T. trichura and H. nana and only 2.63% showed a mixed infection with A. lumbricoides. Similar incidences have been reported in many studies.8,21-27 Lower incidences have also been reported which are probably associated with differences in geographical areas, socio-economic factors and higher community compliance of control programmes in those areas.15, 19, 20, 22, 24, 28

The intensity of infection ranged from 48 to 40,80,384 eggs/gram of faeces for ascariasis to 312 – 4200 egf for trichuriasis.

Higher intensities were noted for females as compared to males although more male children had parasitic infections as compared to females. Similar results were found by Virk29 and Magambo30 in their studies. Heavy intensity infections were found in 8.5% of the faecal samples with samples with A. lumbricoides showing a higher worm burden than T. trichura. Also, A. lumbricoides egg counts were significantly higher in the 6-10 years age group.

The prevalence of STH showed an age dependent relationship with the lowest prevalence in the 0-<2 years age group and the highest in the 2-8 year age group. These findings are also consistent with those reported by others.31, 32

The study established the occurrence and prevalence of the commonest soil transmitted helminths in a rural area of Lahore. This sets the stage for the design and implementation of more detailed epidemiological studies.
References