PREVALENCE OF INTESTINAL HELMINTHS AMONG SCHOOL CHILDREN IN KHYBER PAKHTUNKHWA.

Gohar Rehman, S. Abrar, Tufail Muhammad

ABSTRACT

Background: Intestinal parasites is a global health problem. Of all these, helminthiasis is an important cause of morbidity and malnutrition. In school children, helminthiasis is associated with poor growth, reduced physical activity, impaired cognitive function and learning ability which culminates in impaired educational performance and reduced school attendance. The objective of this study is to establish the prevalence of soil transmitted helminths in school children and provide a base for deworming intervention and control strategies for primary schools in Khyber Pakthunkhwa.

Methods: It was a cross-sectional study conducted over a period of five months (Oct 2012 to Feb 2013) on primary school children of class one, class two and class three, selected from the eight districts of Khyber Pakhtunkhwa through multistage random sampling. Stool samples of 2573 primary school students (one sample from each student) were analysed through direct wet smear microscopy. The process was monitored by a team of Parasitologists. Data obtained was analysed using SPSS software; and frequencies, percentages, 95% Confidence Intervals were calculated.

Results: Out of the total stool samples,1005 (39.06% with a 95% Confidence Interval of 37.17-40.95 %) were helminth positive. Out of the total helminth positive samples, 518(51.5%) were contributed by Zone-D. Round worms were 597(59.4%) in the total positive samples which was the highest proportion while the lowest proportion (4.9%) was noted for Whip worms.

Conclusions: Helminthiasis was found to be a health problem among the study population. Deworming and health promotion activities could better control the problem.

Keywords: Helminthiasis, Malnutrition, Health promotion, School Health Services

INTRODUCTION

Every year, about two billion people become infested globally and about three million experience severe morbidity due to intestinal parasites[1]. Parasitic infections deprive the poorest of the poor, of health and well-being, slow their economic progress and contribute to social marginalization. Of the intestinal parasitic infections; helminthiasis is an important cause of morbidity and malnutrition, particularly in most of the tropical countries, including Pakistan. Although, helminths affect all age groups, but the problem is predominant among school children(over six hundred million school age children are living in areas where these parasites are intensively transmitted and are in need of treatment and preventive interventions)[2] and is often associated with poor growth, reduced physical activity, impaired cognitive function and learning ability[3]. These adverse health consequences combine to impair childhood educational performance and reduce school attendance.

The objective of this study is to establish the prevalence of soil transmitted helminths in school children. In case of soil transmitted helminths, the infection is caused by ingestion of eggs from contaminated soil (Ascaris lumbricoides and Trichuris trichura) or penetration of the skin by larvae in the soil (Hook worms). Soil-transmitted helminths impair the nutritional status in multiple ways. The worm feeds on host tissues, including blood, which leads to a loss of iron[4] and protein, increase malabsorption of nutrients. Some soil-transmitted helminths also cause loss of appetite and therefore a reduction of nutritional intake and physical fitness. Trichuris trichura can cause diarrhea and dysentery.

Khyber Pakhtunkhwa(KP) lacks published data on the prevalence of helminthiasis among school children. Helminthiasis is one of the major causes of childhood malnutrition, anemia, stunted physical and mental growth, recurrent gastro-intestinal infections, recurrent upper respiratory infections, sleeplessness and poor cognitive performance. Heavy infections in children may lead to intestinal obstruction and rectal prolapse. Iron deficiency is associated with a high risk of long-term impairment in mental and motor development. They can also suffer from lower scores in IQ test, lack of concentration, short attention span and easy distractibility[5]. Keeping these facts in view, this study was conducted to provide a basis for introduction and sustenance of deworming intervention at primary schools in Khyber Pakthunkhwa and develop effective control strategies and case management options at Provincial and district levels.

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MATERIAL & METHODS

This cross-sectional study was conducted on 2573 students of forty primary schools in eight districts of Four-Defined Zones of Khyber Pakhtunkhwa (Table:01) through multistage random sampling. Study was conducted from October 2012 to February 2013.

Ethical clearance for the study was obtained from the Ethical Review Committee of Pakistan Paediatric Association KP. A team of 04 technicians was trained for two weeks at the Pathology laboratory of Hayatabad Medical Complex Peshawar. Permission of the Director General Primary Education, KP was obtained and study plan was explained to the respective Executive District Officer Education and concerned Head Teachers. Class one, Class two and Class three students were included while those who were absent or whose parents did not show willingness were excluded from the study. Stool collecting spatula, container and zip-lock plastic bags were given to the study population, guided how to collect stool sample of an individual student only once, in the morning and bring it to the school.

Stool sample analysis was done through direct wet smear microscopy. A drop of normal saline was placed on a clean slide and a small amount of stool sample (~2mg) was thoroughly mixed with it. A cover slip was placed over it and observed under the microscope using low power (×10) objective lens. A team of parasitologists randomly visited the study sites and examined at least 10% of the slides already reported by the technicians.

Data on stool samples was analyzed using SPSS and MS Excell soft wares. Frequencies and Percentages along with 95% Confidence Intervals (CI) were calculated.

RESULTS

Out of 2573 stool samples examined, 1005 (39.06 % with 95% CI: 37.17-40.95 %) were positive for intestinal helminths. Roundworm (Ascaris lumbricoides) was the predominant helminth (23.2 % with 95% CI: 21.57-24.83 %), followed by Hookworm or Ankylostoma duodenale (7.97% with 95% CI: 6.92-9.02%), Hymenolepis nana (3.26% with 95% CI:2.57-3.95 %) Tapeworm (2.68% with 95% CI: 2.06-3.3 %), Whipworm or Trichuris trichiura (1.93% with 95% CI:1.4-2.46 %) among all stool samples.

DISCUSSION

About two fifth of the samples were positive for helminthes (Fig-01), among those, half were from zone-D and the lowest proportion was from Zone-C (Fig-02). In positive samples, Roundworms were in the highest proportion while Whipworms were the least. Most of the Roundworms were found in Zone-A and Zone-D, while the least in Zone-C (Fig-03). A study on primary school children in rural areas of Peshawar, also

Table: 01 Division of Khyber Pakhtunkhwa into Four Zones.

Zone	Definition	Districts Selected
A	Low lying, warm & humid	Peshawar & Swabi
B	Wet & cool highlands	Lower Dir & Bunir
C	High altitude mountainous areas with a cold winter	Upper Dir & Swat
D	Low lying dry & hot areas	Karak & D.I Khan

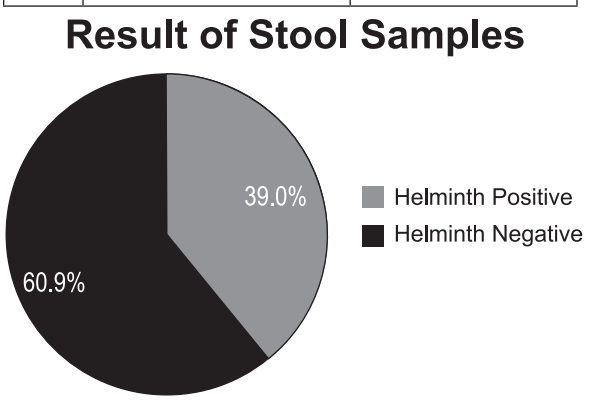

Figure: 01

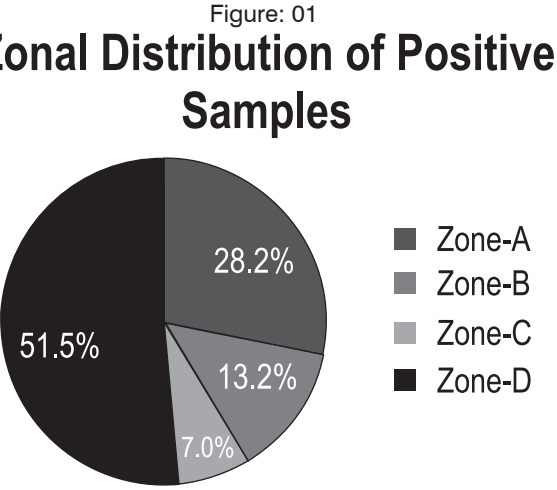

Figure:02

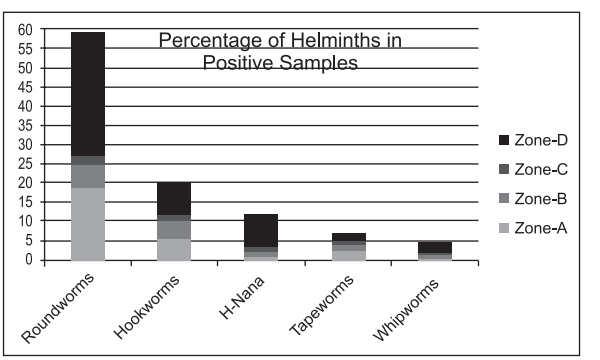

Figure: 03

communicated that the most common helminth was Roundworm with a percentage of 45.5% followed by H-nana, Pinworm, Hookworm, Whip-worm and Tape-worm[6]. A similar study conducted in the rural areas of Abbottabad, found that 48% of positive cases had Roundworms[7]. A hospital based cross-sectional study in District Bagh (Azad Jamu Kashmir) revealed highest proportion of Roundworms (51.72 %) in positive cases[8]. Internationally as well, Roundworm is found in highest frequency[9].

The number of stool samples collected from Zone-B and Zone-C were small as compared to Zone -A and Zone-D, due to long period of school closures and other operational problems.

Field teams encountered a number of problems due to unstable security situation in some areas, attacks on Polio workers and prolonged school closure due to winter vacations in Zone -B and Zone-C. Barring few exceptions, Education Department fully cooperated with the Field Team and facilitated their work.

Control strategy for soil-transmitted helminths could be through the periodic deworming according to standard protocols, of all at-risk individuals living in endemic areas, irrespective of previous diagnosis. This action ensures control not only in primary school children but also community wide control of soil transmitted helminths[10].Health promotion activities like health education, behavior change communication, and environmental sanitation could be aimed both at the school and home levels. Hygiene could be introduced as a compulsory subject in primary schools. Education and Health department may improve the situation through collaboration and mutual cooperation. Washing hands with soap, before taking meal and after attending toilet, should be emphasized, both by teachers and parents. Eating unwashed raw fruit and walking bare footed should be discouraged.

CONCLUSION

Helminthiasis was found to be a health problem in all primary schools of the selected Zones. Nearly half of the study population was found to have helminthiasis and the results were consistent with those of other similar studies in KP. Periodic deworming programs supported by health promotional activities are the mainstay control strategies. The concept of School Health Services should be re-vitalized and incorporated as a policy component.

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