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Javeria Jeri Ghani, Nisar Ahmed, Kamran Ashraf, Muhammad Ijaz and Azhar Maqbool

Full Length Research Paper

Prevalence of intestinal parasites from fingernails of primary school going children of district Lahore

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Intestinal parasitic infections are widely distributed throughout the world and children are the most affected population. In primary schools environments children have proven to be more susceptible for acquiring Intestinal parasites (IP) through fingernails. The present study was carried out to assess the prevalence of intestinal parasites in children of primary schools of district Lahore. 300 nail samples were collected from primary school children of different ages and sexes. The parasites were isolated from the fingernail dirt of both sexes and prevalence was recorded. The collected data was analyzed using SPSS version 20. The prevalence of parasites was presented as descriptive statistics, while the relationship between several variables (age, gender, educational levels) and presence of parasites was determined by chi-square test. The level of significance used was $P < 0.05$. The highest prevalence was observed for *Enterobius vermicularis*, was (23.8%) whereas lowest prevalence was found for *Taenia saginata*, (4.76%). The other parasites found were, *Trichuris trichiura*, (9.52%), *Ascaris lumbricoides*, (9.52%), *Entamoeba histolytica* and *Entamoeba coli* (14.28%), *Giardia lamblia*, (14.28%) and *Hymenolepis nana*, (9.52%). Overall prevalence was found to be 21%.

Key words: Intestinal parasites, parasitic diseases, primary schools children, prevalence.

INTRODUCTION

Parasitic diseases have been the most important civic health problem for man for eras and are still a big problem in many of the emerging countries especially in the rustic and city shantytown areas of tropical and semi tropical countries of the world (Sinniah et al., 2012). Soil-transmitted helminths (STHs) include; *Ascaris lumbricoides*, *Trichuris trichiura* and hookworms. They are utmost mutual abdominal parasites (Bethony et al., 2006). Largest and utmost communal helminth that lives

in human intestine and presently infects nearby 1000 million people globally is *A. lumbricoides* (DPDx 2006).

Soil-transmitted helminthes (STH) are mainly malicious, transmitted through soil, and are amongst the ten greatest shared infections in the sphere (Shrestha et al., 2012). From the paced period of 1998 to 2002 only, an astonishing average of 1,329 food-borne epidemics was stated each year to the Center for Disease Control and Prevention (Lynch et al., 2006).

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The most prevalent intestinal parasite was *A. lumbricoides* (Al-Zain and Al-Hindi, 2005). *A. lumbricoides* and *Enterobius vermicularis* were the most communal species affecting human beings. *Ancylostoma duodenale* and *T. trichura*, *Taenia saginata* and *Taenia solium* are other common cestodes (Guerrant et al., 2011). Intestinal parasites were blamed for producing some of the main infections all over the world like, amoebiasis, giardiasis, ascariasis, hookworm diseases and trichuriasis. These diseases are strictly connected to the low socioeconomic rank, deprived cleanliness, insufficient therapeutic care and lack of pure, drinkable water deliveries (Abu-Madi et al., 2008).

MATERIALS AND METHODS

Study site

The present project was designed to study the prevalence of intestinal parasites from fingernails of primary school going children of District Lahore. Seven different private and government primary schools (3 from developed and 4 from underdeveloped areas) located in District Lahore were included in this study. These samples were processed and analyzed in laboratory, department of Parasitology University of Veterinary and Animal Sciences, Lahore.

Sample source

A total of 300 nail samples of primary school children having long and dirty (blackish) nails under the age of 10 years of both sexes were examined for the presence of parasites.

Sample collection

Fingernail clippings were collected from both hands of each subject using clean nail clippers and were placed in labeled containers containing normal saline solution.

Laboratory investigation

Processing of sample

A drop of mixture of the swabbed sample with normal saline was transferred using a sterile plastic Pasteur pipette to the center of clean grease-free slide and carefully covered with a clean cover slip in order to avoid air bubbles and over floatation. Direct microscopic examination for ova of helminthes was carried out using X10 and X40 magnification objectives, respectively (Cheesebrough, 2005).

The following procedure was used for preparing wet mounts of the nail clippings: Initially the clippings were immersed in 10% potassium hydroxide solution for 24 h, and subsequently centrifuged at 2500 rpm for 3 to 5 min. The supernatant was discarded while the sediment of each specimen was stained with Lugol's Iodine and Eosin and subsequently examined by light microscopy at 100-400X magnifications for species identification. Helminths were identified from their characteristic egg morphology, and protozoa from their cysts and/or vegetative forms. Trichrome staining was used for preserving positive preparations (Suriptiastuti et al., 2011).

Microscopy

The microscopic work was done according to Suriptiastuti et al. (2011) in the Department of Parasitology, Faculty of Veterinary Sciences, University of Veterinary and Animal Sciences Lahore.

Statistical analysis

The collected data were analyzed using SPSS version 20. The prevalence of parasites was presented as descriptive statistics, while the relationship between several variables (age, gender, educational level) and presence of parasites were determined by chi-square test. The level of significance used was $P < 0.05$.

RESULTS

A total of 300 children have served for this study that was directed to assess the prevalence of intestinal parasites among elementary school offspring of district Lahore. Out of 300 children 150 were males and 150 females. Out of 150 female children the prevalence of parasites observed was $n=48$ (16%) whereas in male this ratio was comparatively high, that is, $n=78$ (26%). Out of 300 samples collected for the study a total $n=63$ (21%) samples showed the prevalence of intestinal parasites. In 63 parasite positive samples $n=24$ parasites were observed. Out of 63 parasite positive samples, the highest prevalence was observed for *E. vermicularis*, $n=15$ (23.8%) whereas lowest prevalence was found for *T. saginata*, $n=3$ (4.76%). The other parasites found were, *T. trichiura*, $n=6$ (9.52%), *A. lumbricoides*, $n=6$ (9.52%), *Entamoeba histolytica* and *Entamoeba coli*, $n=9$ (14.28%), *Giardia lamblia*, $n=9$ (14.28%) and *Hymenolepis nana*, $n=6$ (9.52%) (Table 1). Out of 63 parasite positive samples a high prevalence, $n=39$ (61.90%) was noted for male children and female children had comparatively low prevalence, $n=24$ (38.09%). Predominance of parasites among various school kids has been watched most noteworthy in MA Model School Al-habib Park Bilal gunj (40%) and lowest in Government Girls Primary School Junior Model Awan Town (10%). In Punjab Standard School Datanagar Badami Bagh, parasite prevalence was 36.36%. In Government Girls Primary School Aziz Colony Shahdra it was 20%, 33.33% in Al-jadeed Model School Khyber Park Sanat Nagar, 17.64% in Government Primary School Iqbal Model Samanabad parasite prevalence and 12% in The Punjab School Township prevalence; hygienic conditions of some schools were found not satisfactory resulting in high prevalence of parasitosis in children (Table 2).

DISCUSSION

In the present study, general predominance of intestinal parasites was 21%. This finding is lower when compared

Table 1. % Prevalence of different parasites of nails in primary school children.

Parasite	No. of positive children out of 63	Prevalence (%)
<i>Giardia lamblia</i>	9	14.28
<i>Entamoeba histolytica</i>	9	14.28
<i>Hymenolepis nana</i>	6	9.52
<i>Entamoeba coli</i>	9	14.28
<i>Entrobilus vermicularis</i>	15	23.8
<i>Ascaris lumbricoides</i>	6	9.52
<i>Trichuris trichiura</i>	6	9.52
<i>Taenia saginata</i>	3	4.76
Total	63	

Table 2. %Prevalence of different intestinal parasites of nails in different primary schools.

Names of schools	No of examined children	No of Positive children	<i>E. vermicularis</i>	<i>Ent. histolytica</i>	<i>A. lumbricoides</i>	<i>T. trichiura</i>	<i>T. saginata</i>	<i>Ent. coli</i>	<i>G. lamblia</i>	<i>H. nana</i>
Government Girls Primary School Aziz Colony Shahdra	45	21	6	6	3	-	-	-	6	-
MA Model School Al-habib Park Bilal Gunj	30	9	-	-	-	6	-	3	-	-
Punjab Standard School,Datanagar Badami Bagh	33	15	6	-	3	-	3	-	3	-
Al-jadeed Model School Khyber Park Sanat, Nagar	36	9	3	-	-	-	-	6	-	-
Government Girls Primary School Junior Model Awan town	30	3	-	-	-	-	-	-	-	3
Government Primary School Iqbal Model Samanabad	51	3	-	3	-	-	-	-	-	-
The Punjab School Township	75	3	-	-	-	-	-	-	-	3
Total	300	63	15	9	6	6	3	9	9	6
% prevalence of parasite			23.8	14.28	9.52	9.52	4.76	14.28	14.28	9.52

with Chirdan et al. (2010) who reported a predominance of 57.8% in Jos, focal Nigeria. Be that as it may, it is in consent to some degrees with Gonçalves et al. (2011), who reported a pervasiveness of 29.3% in the area of Uberlândia, State of Minas Gerais, Brazil and furthermore with the discoveries of Wongstitwilairoong et al. (2007) who reported a predominance of 27.9% of asymptomatic controls (66/236) and 17.4% of

symptomatic cases (41/236) in Sangkhlaburi, Thailand, among primary school youngsters. The low pervasiveness of intestinal parasitism in this study was credited to the level of cleanliness, and hygienic environment among the elementary schools. High commonness of intestinal parasitic disease is proper to happen in low financial conditions, portrayed by lacking water supply and poor clean transfer of dung (Bhattachan et al.,

2015). The segregate transfer of human squanders and hygienic lifestyle may have been inclining elements, as the kids play on a perfect ground. Be that as it may, few day care focuses do not have these components prompting disease among the youngsters who interact with polluted playing ground. The elementary schools in this study were situated in Lahore which is the second greatest city having populace of 10 million (range

of 1,772 km²) of Pakistan at world rank number 40 between the urban zones. The education rate of Lahore is 74% which is the huge element for commonness of parasitosis. Climatic conditions of Lahore are hot and stormy, temperature takes off to 40 to 48°C, vary in the month of May, June and July. The lower commonness acquired at day care focuses could likewise be credited to the planning and the topographical contrasts in the zone, as this work was led between the months of January to March (dry season, when the dirt is generally dry).

The present study was endeavored to survey the pervasiveness of various nail parasites. Fast industrialization and a movement of the populace from provincial to urban zones have created disintegration in the ecological quality. It is not strange to discover ranges of neediness and poor sanitation inside urban communities and parasitic contaminations are seen to be a typical issue among kids. Intestinal diseases are predominantly water conceived because of poor sterile conditions and unhygienic conditions, for which untrimmed and defiled finger nails are likewise, be a cause.

Conclusion

Despite the fact that the prevalence rates of fingernail parasites in this study were considerably lower than prevalence rates observed in similar studies conducted in other regions of the world, the rates of the infections are however of public health significance. The occurrence of fingernail parasites among children in primary schools can cause chronic infections which can negatively affect all aspects of children's health, nutrition, cognitive development, learning and educational access and achievement. Intestinal parasitic infections are highly prevalent in urban areas. Poverty is an important factor associated with IPIs and the government should enhance the activity of poverty reduction programs. Age is an important predictor of IPIs. There is a need to promote mass scale deworming and health promotion campaigns to create awareness about health and hygiene. Therefore, an intervention strategy should be designed and implemented including provision of adequate and safe water supply, regular deworming and health education on personal hygiene to the students and to the parents.

Conflict of interests

The authors have not declared any conflict of interests.

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