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Original Article

Assessment of Intestinal Parasitic Infections and Risk Factors among Suspected Patients Attending Kirambo Health Center

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ABSTRACT

Objective: To assess the frequency of intestinal parasitic infections and risk factors among patients attending Kirambo health center. Questionnaires were taken into consideration to assess risk factors. The stool specimens were examined by adding small portion of stool in normal saline on slide then covered with cover slip and read on 10 x and 40 x objectives. **Findings**: The results of this study revealed that females were slightly more prevalent than males with 62.2 and 59.3% respectively. Patients presented high level of intestinal parasites was aged less than 10 years old with 87.7%. The prevalence of intestinal parasites among patients attending Kirambo health center was 62.7%. Bear footed always, poor cleaning of nails without cutting them regularly and poor fruits cleaning sometime with 64.9%, 64.1% and 59.2% were the risk factors that increased intestinal parasites. **Discussion**: This study shows that there are many risk factors such as use of uncovered cleaned toilets, drinking un boiled water, use of stagnant water, poor body and food hygiene which increases the rate of intestinal parasites. This could be due to that people in rural area do not have enough capacity of avoiding the transmission and eradication of intestinal parasites due to a above risk factors. The results from this study show *A. lumbricoides* was very prevalent with 64.4%. Other study shows that, *Ascaris* was the most common parasite with 46.88% in India. In Brazil, *A. lumbricoides* was 39.0%. The study conducted by Ashok *et al.* (2013), showed that *A. lumbricoides* was 23.2%. The differentiation of this prevalence could be due to sample size or endemic zone of study conduction. **Conclusion**: According to the finding from this study, Socio-demographic characteristics increase the prevalence of intestinal parasites. Poor food and body hygiene, inefficiency toilet and improper water source are the risk factors associated with the transmission of parasites. Daily hygiene could be taken under consideration for reducing risk factors and there is a need for integrated control program to have a lasting impact on transmission of intestinal parasitic infection in Kirambo Health center.

Key words: Parasites, age groups, microscopic examination.

1. INTRODUCTION

More than two billion people Worldwide are infected with intestinal parasites. Poverty, illiteracy, poor hygiene, lack of access to potable water, and a hot and humid tropical climate are some of the common factors attributed to intestinal

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parasitic infections (IPI). Parasites are classified in Protozoa (first animals), Platyhelminths (flat worms), Nematodes (round), Acanthocephala (thorny headed) and Arthropods (jointed feet) [1].

Protozoa can be directly be infectious for man when they are passed in the feces into the environment, but helminthes require a period of maturation while in the soil, where they become infectious. Others such as *Taenia saginata* require the involvement of an intermediate host during their life cycle [2]. Most protozoan and helminthes infections that are transmitted by arthropods can readily be diagnosed, on clinical grounds alone, but are usually identified by fairly simple techniques designed to present the presence of the causative parasite by microscopy. Parasitic infections can be diagnosed in a number of ways. In fecal exam also called a stool exam or an ova parasite test. An endoscopy or colonoscopy is also sometimes used if the stool exam is inconclusive [1]

In Africa, more than 90 million school-age children are estimated to be infected with soil transmitted helminthes. [3]) School age children are more predisposed and vulnerable to helminthes infections compared to other age groups. In Soudan, the research revealed that in 2014 intestinal parasites were (47.7%), 51 (39.2%), 58 (44.6%) and 77 (59.2%) in urban, rural and displaced camp areas respectively among children under 5years and the commonest intestinal parasite was *G. lamblia* 33.3%. Its rates were 26.2%, 34.6% and 39.2% for urban, rural and displaced camp area respectively. In Rwanda the study showed the prevalence of 50.5% among Kigali Institute of Education students this was strongly associated with drinking any kind of water [4].The main reason of conducting this study on assessing the frequency of intestinal parasitic infections and risk factors among people of Burera district in Rwanda.

2. MATERIALS AND METHOD

Experimental section is a chief part of this work which carried out on the patients of catchment area of Kirambo health center in Burera district in Rwanda.

Techniques of data collection: Techniques of this study were based on laboratory analysis concerned on intestinal parasites screening. Also a range of questionnaires was used to underline the risk factors of intestinal parasites in catchment area of given health centers.

Sample size determination: Sample size of intestinal parasites screening was corresponding to the total population (1526) for the reason of reducing marginal error and increasing confidence interval while questionnaire addressed to study population.

Specimen collection: Stool specimens of 1526 patients were collected. The samples were collected in clean stool container and labeled at the corresponding unique laboratory code established in patient request form from general lab register on reception, with patient identification record. Each enrolled patient was instructed on how to provide a small portion of fresh stool in cleaned and dried specimen container provided to him by using spatula attached on container's cover then brought to the laboratory immediately after collection.

Wet mount preparation: This was the process applied immediately after receiving specimen immediately in the case of avoiding death parasites or changes in form of parasites. Wet preparation involved iodine and saline solution as reactant mixed with stool on a cleaned grease-free slide and covered the slide by cover slip and the results were recorded after Microscopic examination.

Microscopic examination: The prepared slide was placed on microscopy and examined with low power microscopic objectives; the aperture diaphragm on condenser was closed and the lower power (10×) objective was adjusted into a place of well fixing microscopic field, then after put on (40×) objective for eggs and cyst observation and confirmation.

3. RESULTS AND DISCUSSION

Prevalence of intestinal parasites: Intestinal parasitic infections screened with high level in rural area. The following table presents the prevalence of intestinal parasites**.**

Table 1: Overall prevalence of intestinal parasites

	Total population	Positive cases	Prevalence (%)
Kirambo	1526	958	62.7

The results from this table demonstrate that the overall prevalence of intestinal parasites was 62.7% in Kirambo. These results are not beyond those of Gimba & Dawam [5], in Soudan revealed that intestinal parasites were 47.7 % in rural, 39.2 % in urban and 59.2 % in displaced camp areas. In Pakistan, the prevalence was 71 .2% [6] . In Chitradurg 28% was infected and overall prevalence of intestinal worm infection was found to be 49.38% in India [7]. In Rwanda, the study showed that the prevalence of 50.5% was screened among Kigali Institute of Education students [8].

Social demographic characteristics

Table 2: Distribution of socio-demographic characteristics in KIRAMBO Health centers

	Total population	Positive case	Prevalence (%)	P-value
Sex				
Male	959	559	58.3	0.06
Female	567	399	61.6	
Age groups				
< 10	501	818	85.2	0.0001
[10-20[	119	65	54.7	
≥ 20	906	480	53	
Economic class				
I	200	149	74.4	
II	700	426	60.8	0.0001
III	556	334	60	
IV	70	4	5.8	

The result of this study reveals that females were slightly more prevalent than males with 61.6 and 58.3% respectively

but no statistical difference (p > 0.5). Amut & Mker (2008) [9], peaked the prevalence of 75% was observed among women. The study conducted by Gimba *et al*. (2015) [10] on patient attending Gwagwalada township clinic, Abuja in Nigeria where the overall prevalence of intestinal parasites was higher in females than males with 25.7%. The boys' infection prevalence 26.1% was slightly lower than the infection prevalence of the girls 30.3% in Brazil [11] (Nobre *et al*., 2013).

In this study patients presented high level of intestinal parasites were aged less than 10 years old with 85.2%. This study reveals that people with low income suffer from intestinal parasites with 74.4%. It seems to be the same as the study done in Brazil which showed that a low per capita income of family was strongly associated with an increased risk for an infection with 59.3% [12] Other study in Brazil showed that low income was associated with intestinal parasites with 0.7, 7, 47 and 45.3% class I, II, III and IV respectively [13].

Types of intestinal parasites

The frequency of intestinal parasites screened differently regional by regional. The following table reveals the types of intestinal parasites screened in study participants.

Table 3: Distribution of types of intestinal parasites in KIRAMBO health Centers

Types	Frequency	%
E. histolytica	151	15.8
G. lambria	19	2
A. lumbricoides	616	64.4
E. coli	4	0.4
T. intestinalis	102	10.7
T. trichiura	63	6.6

This study shows that there are different types of intestinal parasitic infections among patients attending KIRAMBO health center. This could be due to the favorite condition of intestinal parasites in this area.

The results from this study show *A. lumbricoides* was very prevalent with KIRAMBOwi 64.4% . The other study shows that, *Ascaris* was the most common parasite with 46.88% in India [14] . In Brazil, *A. lumbricoides* was 39.0% [15]. The study conducted by Ashok *et al*. (2013) [16] , showed that *A. lumbricoides* was 23.2% in Ethiopia. There is other study in the same agreement; where *E. histolytica* was estimated to infect about 10% of the world population [17]. *E. histolytica* was 48.86% in Pakistan [18]. In Brazil, *E. histolytica* 56.2% [19]. *Entamoeba histolytica* was 54.5% in Rwanda [20] .In this study, *T. trichiura* was 3.3%. The study conducted in Brazil, showed that *T. trichiura* 2.0% [21]. In Brazil, *G. lamblia* was 29.0% [21]. The study conducted by Ashok *et al*. (2013) showed that *G. intestinalis* was 18.8% in Ethiopia. *G. duodenalis* was 3.6% In Rwanda (Emile *et al*., 2013). The differentiation of prevalence could be due to sample size or endemic zone of study conduction.

Risk factors of Intestinal parasites: This study shows that there are many risk factors such as use of un covered cleaned toilets, drinking un boiled water, use of stagnant water, poor body and food hygiene which increases the rate of intestinal parasites. This could be due to that people in rural area do not have enough capacity of avoiding the transmission and eradication of intestinal parasites due to a above risk factors. Other study showed that 95% of the houses had access to treated tap water and 92.2% were connected to a sewage system in Brazil [11]. The other study in Brazil revealed that intestinal parasites were associated with no toilet 14.4&, indoor toilet with flush 58%, indoor toilet without flush 7.3, pit latrine with water 12.3% and only pit latrine 8%. In Uganda, 83 and 74% classified as less poor and poor respectively. Parameters for exposure to wastewater, access to drinking water, sanitation, and hygienic behaviors are 64% and 47%, respectively

4. CONCLUSION

Intestinal parasitic infections are one of the burdens of people in low income country. According to the finding from this study, intestinal parasites were screened with high rate in the region. Socio-demographic characteristics increase the prevalence of intestinal parasites. Poor food and body hygiene, inefficiency toilet and improper water source are the risk factors associated with the transmission of parasites.

Recommendations

1. To enforce many of the docile environmental laws in order to make people live in healthy environments.
2. To set a periodic Information Education and Communication (IEC) about intestinal parasites.
3. To take care for daily hygiene for living free from intestinal parasites.
4. To participate in action of eradicating intestinal parasitic infection5. To implement the measurements of follow up the action of controlling risk factors of intestinal parasites.

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