

Prevalence of hookworm infection and its association with anaemia in a rural community in North-Western Amhara, Ethiopia

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Background

Soil-transmitted helminths (STH) which include *Ascaris lumbricoides*, *Trichuris trichiura* and the hookworm (*Ancylostoma duodenale* and *Necator americanus*) are the most widespread neglected tropical diseases (NTDs). It is estimated that more than 2000 million people are affected by STH infections worldwide, and more than 300 million suffer from associated severe morbidity. In sub-Saharan Africa, hookworm are the most prevalent STH, widely distributed either in rural and urban areas. The World Health Organization (WHO) recommends mass drug administration (MDA), as a public health tool against helminth infections to reduce the worm burden and morbidity of the infection. For controlling STH, MDA programmes target school-age children (SAC) and preschool-aged children (pre-SAC). The final purpose of the strategic plan is eliminating STH as public health problem in childhood by 2020. However, unlike the other STHs, most of the hookworm are harbored by adults and this could be a key point for controlling transmission and morbidity.

Ethiopia bears the third higher prevalence of hookworm in Africa. Also, the second higher prevalence of *A. lumbricoides* and the fourth of *T. trichiura*. Lack of drugs supply and lack of an updated prevalence map are among the main gaps identified for control programs. A Master Plan for national coverage was launched in 2013 by the Federal Ministry of Health.

Material/methods:

The study was carried out in November 2014, in a rural community belonging to Bahir Dar, Amhara region, in the North-West Ethiopia (Figure 1). Stool and blood samples were collected in a "gott", or one of the districts in which the municipalities are divided in the rural area in Ethiopia. Houses were randomly selected. All the inhabitants of each selected house were invited to participate.

Stool specimens were processed with a filtration-concentration method (Bloparaprep MINI®, Laboratorios Leti, Barcelona) in the laboratory of Bahir Dar University. Haemoglobin determinations were carried out in an Abbot CELL-DYN® 1800 Hematology Analyzer, in Bahir Dar Regional Health Research Laboratory Center.



Figure 1. Ethiopia in the horn of Africa

This study was implemented in the frame of a research for knowing the prevalence of *Strongyloides stercoralis* in the area.

Results

Samples from 65 people were collected: 62% adults and 38% less than 14. The mean age was 28 (range 5-90). Of adults, 46.3% were women, and 73.7% of them of childbearing age.

The overall prevalence of intestinal helminths was 90.76%, (hookworm, *A. lumbricoides*, *T. trichiura*; *S. stercoralis*, *Schistosoma mansoni* and *Hymenolepis diminuta*). Hookworm was detected in 82%, being the main parasite.

The hemoglobin values ranged from 3.1 to 16 g/L, mean (12.2). Haemoglobin values were classified according to WHO groups (children less than 5, 5-11 and 12-14, non-pregnant women, pregnant women and men 15 years of age and above) as mild, moderate and severe. The prevalence of anemia was 36.92% (see figure 2).

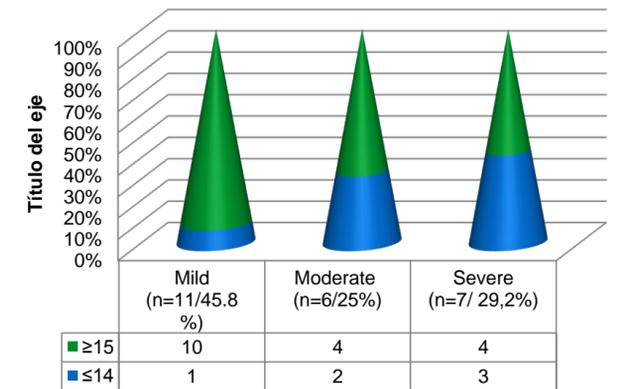


Figure 2. Anemia by groups of age

All patients with anemia except 3 with severe deficit (2 women of childbearing age and 1 child) were hookworm positive. There was no difference between the prevalence of anemia in children and adults. There was no difference when comparing the group of women of childbearing age with the rest of adults. No association between anemia and hookworm infection was found.

Conclusions

The prevalence of hookworm was extremely high in all groups of age.

No association of hookworm infection with anemia was found.

Adult men and women (even above the childbearing age) are also a population at risk of STH infection and anemia.

In order to ensure effective intervention strategies for controlling of STH, it would be advisable to implement larger studies to know the prevalence of hookworm and other intestinal parasites at community level.



❖ Assessing the epidemiology of soil-transmitted helminths during a transmission assessment survey in the global programme for the elimination of lymphatic filariasis. WHO 2015

❖ The burden of neglected tropical diseases in Ethiopia, and opportunities for integrated control and elimination Parasites & Vectors 2012

❖ An economic evaluation of expanding hookworm control strategies to target the whole community. Parasites & Vectors 2015