



Epidemiology of soil-transmitted helminth and malaria parasite infections in a rural community in Lagos state

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ABSTRACT

Objective: Soil-transmitted helminthiasis is a neglected tropical disease more commonly associated with poverty. Malaria on the other hand ravages children when exposed to infected female anopheles mosquito resulting to infection, illness and death. These infections are of public health importance in Nigeria especially in impoverished communities. The aim of this study was to determine the prevalence and intensity of soil-transmitted helminths (STH), malaria and anaemia among children and adults in Ijede LCDA, Lagos State.

Methodology and Results: A cross-sectional study was conducted among 1684 children and adults in Ijede community. Stool and blood samples were collected and analysed for STH parasites using Kato Katz technique, malaria parasite using Giemsa stain and anaemia by haematocrit concentration method respectively. Questionnaire was used to elicit information on socio-demography, and various risk attributes of these infections. Data was analysed using SPSS version 26. Overall, 78 (5.4%) of 1447 persons tested for malaria had a positive blood result. Light to moderate helminth infection was detected in 10 (1.8%) of 543 stool samples. The helminth infections comprised 1 (0.2%) case of *Echinostoma*, 2 (0.4%) cases of *Trichuris trichiura*, 1 (0.2%) case of *Strongyloides stercoralis* and 6 (1.1%) cases of *Ascaris lumbricoides*. More male than female was infected in both MP ($P < 0.05$) and STH ($P > 0.05$). *E. histolytica* was the only enteric protozoa seen. Anaemia was prevalent in 121 (9.8%) individuals with MP contributing 2.8% of all anaemia cases ($P > 0.05$). Among different communities studied, Ijede had highest prevalence of MP (3.9%) while Okeletu had highest prevalence of STH (3.2%). High percentage of underweight was recorded among individuals infected with STH. Malaria and *Ascaris spp* is the most prevalent parasite infections.

Conclusion and application of results: This study shows reduced prevalence of parasites compared to those seen in the same region in the past. Routine screening, drug administration, health education on hygiene and nutrition are recommended.

INTRODUCTION

Globally, intestinal parasitic infections are among the most common of infections that affect the poorest and most deprived communities. (WHO, 2020). It is a public health problem caused by helminths and intestinal protozoa (Hotez *et al.*, 2015, Turkeltaub *et al.*, 2015, Visvesvara *et al.*, 1997). The soil-transmitted helminths *Ascaris lumbricoides*, hookworm, *Trichuris trichiura* and the protozoan *Entamoeba histolytica*, *Giardia intestinalis* and *Cryptosporidium* sp. are the most common intestinal parasites, world over (David *et al.*, 2015). World Health Organisation (WHO) estimated that over 1.5 billion individuals are infected and 450 million are ill because of these parasitic infections (WHO, 2020). The incidence of these intestinal parasitic infections is 50% in developed countries, whereas it reaches up to 95% in developing countries (WHO, 2020). The rate of infection is remarkably high in Sub-Saharan Africa where over 267 million preschool-age children and 568 million school-age children are at risk (WHO, 2020). Eggs present in human faeces, which in turn contaminate the soil in areas where sanitation is poor, transmit the parasites. In Nigeria, intestinal helminth infections have persisted due to low living standards, inadequate environmental sanitation, and ignorance of simple health-promoting behaviours (Iduh *et al.*, 2015). These infections are most common in school-aged children and likely to be more severe in this age group (Iduh *et al.*, 2015) and have been linked to an increased risk of nutritional anaemia, protein-energy malnutrition, and growth deficiencies (Sackey *et al.*, 2003). Several environmental and socioeconomic factors have been implicated in the persistence of intestinal parasite infections in children. The worms increase malabsorption of nutrients and roundworms may possibly compete for vitamin A in the intestine. Some

soil-transmitted helminths can also cause loss of appetite and, therefore, a reduction of nutritional intake and physical fitness. In particular, *T. trichiura* can cause diarrhoea and dysentery (WHO, 2020). Malaria is another parasitic disease that causes morbidity and mortality in Nigeria. According to Global Malaria Report, there were 241 million cases of malaria in 2020 compared to 227 million cases in 2019 (WHO, 2021). The estimated number of malaria deaths stood at 627 000 in 2020 – an increase of 69 000 deaths over the previous year. While about two thirds of these deaths (47 000) were due to disruptions during the COVID-19 pandemic. In 2020, it was estimated that 95% of global malaria cases were in the WHO African Region, which is an estimated 200 million cases (WHO, 2021). Nigeria tops the list and accounts for 25% of global malaria cases followed by four other African countries (WHO, 2021). In areas with high transmission of malaria, children under five are usually vulnerable to infection, illness, death, and account for about 80% of all malaria death in the region.

In the tropics especially in Nigeria, helminthiasis and malaria constitute a major public health problem, as these areas are often characterized by favourable conditions that allow the parasite to thrive. Humid climate, poor sanitary conditions, lack of clean portable water, and poor environmental sanitation and socioeconomic status are some of these factors. The diseases are a major cause of morbidity and mortality, especially in semi-urban resource-limited settings like Ijede local government development area (LCDA), a health surveillance demographic system for NIMR and the site of this study. Education, personal hygiene, environmental sanitation and preventive chemotherapy in targeted at risk groups are applicable control measures in both parasitic diseases. This includes periodic