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The clinical sensitivity of standard direct wet mount microscopy for soil-transmitted helminth infections in school children in Jimma, South-West Ethiopia

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Abstract

Introduction: Soil-transmitted helminthiasis is a disease caused by *Ascaris lumbricoides*, *Trichuris trichiura* and the two hookworms (*Ancylostoma duodenale* and *Necator americanus*) and remains a major public health problem in school children in Ethiopia. Although direct wet mount microscopy is the standard means to diagnose intestinal parasitic diseases in health care facilities in Ethiopia, it remains unclear what its diagnostic performance is for soil-transmitted helminths .

Aim: To determine the clinical sensitivity of standard direct wet mount microscopy for soil-transmitted helminth infections compared to the composite reference standard in school children in Jimma, South-West Ethiopia

Methods: A school based cross-sectional study was performed in Jimma Town and included 600 children from 10 primary schools. The clinical sensitivity of direct wet mount microscopy was compared to a composite reference standard consisting of Kato-Katz thick smear, McMaster and Mini-FLOTAC.

Results: The composite reference standard about 210 *Ascaris* (35.0%), 312 *Trichuris* (52.0%) and 102 hookworm cases (17.0%). The median intensity of infections (expressed as eggs per gram of stool (EPG)) equalled 2,057 EPG for *Ascaris*, 200 EPG for *Trichuris* and 110 EPG for hookworms. The sensitivity of direct wet mount microscopy was 73.8% for *Ascaris*, but was only around 17% for both *Trichuris* and hookworms. For each of the three soil transmitted helminths there was an increase in sensitivity as a function of increasing intensity of infections. For *Ascaris*, the sensitivity ranged from 30.2% for the lowest infection intensities to 94.3% for the highest levels of infection intensity. For both *Trichuris* and hookworms, the sensitivity ranged from nearly 0% to 42.9% across the different levels of infection intensity.

Conclusion: Using direct wet mount microcopy severely underestimated the prevalence of soil transmitted helminths. The sensitivity of direct wet mount microcopy is low for STH, particularly for infections with *Trichuris* and hookworm when the infection intensities are low.