

POOLING STOOL SAMPLES: A COST-EFFECTIVE STRATEGY TO ASSESS INFECTION INTENSITY OF SOIL-TRANSMITTED HELMINTHS AND TO MONITOR DRUG EFFICACY?

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Abstract

Background: Up to date cost-effective strategies to guide health care decision makers on how to optimize control of soil-transmitted helminths (STH) and on how to detect the development of anthelmintic resistance are scarce. In the present study, we developed and evaluated a novel pooling strategy to assess intensity of STH infections and to monitor drug efficacy.

Methods/Principal Findings: Stool samples from 840 children attending 14 primary schools in Jimma, Ethiopia were pooled (pool size of 10, 20 and 60) to evaluate the infection intensity of STH. In addition, the efficacy of a single dose mebendazole (500 mg) through reduction in fecal egg counts (FECR) was evaluated in two of these schools. Both individual and pooled samples were examined with McMaster egg counting method. For each of the three STH, we found a significant positive correlation between mean fecal egg counts (FEC) of individual and FEC based on pooled samples, ranging from 0.62 to 0.98. Compared to the FEC based on individual samples, there was no significant difference in FEC, except for *A. lumbricoides*. For this STH, pools of 60 samples resulted in significantly higher FEC. FECR for the different number of samples pooled was comparable for all pool sizes, except for hookworms. For this parasite, pools of 10 and 60 samples provided significant higher FECR results.

Conclusion: This study highlights that pooling stool samples holds promise as a cost-effective strategy to assess intensity of STH infection on a population level and to monitor preventive chemotherapy programs. When using the McMaster egg counting method, up to 10 samples can be pooled. However, further research is required to gain more insights into the impact of pool size, sample size, detection limit of the FEC method, intensity and aggregation of infections on the validity of pooling stool samples.