A high field gradient magnetic probe for detecting parasite eggs in faecal matter processed by the Helmintex method

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Introduction: The aim of this study was to test the sensitivity of a new method for detecting schistosome eggs in faeces.

Methods: 580 stool samples were collected in an endemic area, Estancia, northeast Brazil and tested using the Kato-Katz (KK) method. A case-control study was then carried out on 20 KK +ve and 20 KK -ve samples (randomly selected). Urine samples were tested with POC CCA. Faecal samples were processed according to the Helmintex method to produce a suspension of solids in a 1.5-mL tube. The suspension was gently stirred for 20 seconds with the tip of a probe that produces a source of high magnetic field gradient at the tip. Two approximately 40-uL droplets were extracted from the sediment by using the probe. Each droplet was deposited on a glass slide during demagnetisation of the probe to enable inspection by optical microscopy. The remainder of the sediment was screened for confirmatory results. For analysis of sensitivity, a composite reference standard was defined as follows: if any of KK, probe, or standard Helmintex screening identified an egg, the case is disease +ve; otherwise -ve.

Results: Eggs were detected in all 20 KK positive samples using the probe. In the KK -ve samples, the probe yielded +ve results for 3 samples. The time needed to read the samples using the probe was approximately one third of the time required to screen Helmintex processed samples by the standard method. Against the composite reference standard, the following sensitivities (95% CIs) were observed: KK 83% (63-95%), POC CCA 79% (58-93%), probe 92% (73-99%), standard Helmintex 96% (79 -100%).

Conclusion: The high field gradient magnetic probe used on Helmintex prepared faecal suspensions can provide rapid and sensitive detection of *Schistosoma* eggs.