



Indicate the format in which you wish to present your work: Poster Oral Presentation

TITLE

SHORT-TERM EVALUATION OF MASS DRUG ADMINISTRATION OF PRAZIQUANTEL REVEALS CONTRASTING PREVALENCES BY MICROSCOPY AND IMMUNOLOGICAL ASSAY IN GHANA

AUTHORS

Boateng E.M.^{*1, 2, 3}; Blay E.³; Osei-Mensah W.⁴; Agyemang A.N.^{3, 5}; Adongo E.^{3, 5}; Ayi I.³

AFFILIATIONS

¹ Department of Zoology and Fisheries, Czech University of Life Sciences in Prague, Czech Republic.

² 1st Faculty of Medicine, Charles University and General University Hospital, Czech Republic.

³ Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Accra, Ghana

⁴ Nuclear Reactors Research Centre, Atomic Energy, Accra, Ghana

⁵ Department of Clinical Microbiology, KNUST, Kumasi Ghana

ABSTRACT

Schistosomiasis caused by *Schistosoma* species remains a significant public health issue, particularly in sub-Saharan Africa. In Ghana, *Schistosoma haematobium* and *Schistosoma mansoni* are prevalent, necessitating interventions like mass drug administration (MDA) of praziquantel (PZQ). This study assesses the impact of mass drug administration (MDA) of praziquantel (PZQ) on the prevalence and immunological responses in a schistosomiasis-endemic community in Ghana.

A longitudinal study involving 112 participants was conducted in Veve area located near the Veve irrigation dam in the Bongo District of the Upper-East Region of Ghana. The main occupation of the people is farming and a few fishing activities. These pre- and post-treatment assessments included microscopy to detect *Schistosoma* eggs in urine and stool. Enzyme-linked immunosorbent assay (ELISA) was used to evaluate anti-*Schistosoma* IgM, IgG, IgG4, and IgE antibodies using *S. haematobium* soluble egg antigen (ShSEA), *S. haematobium* adult worm antigen (ShAWA), *S. mansoni* soluble egg antigen (SmSEA), and *S. mansoni* adult worm antigen (SmAWA).

Microscopy diagnosis revealed a significant reduction in the overall prevalence of schistosomiasis, dropping from 35.7% (CI: 27% - 45%) pre-treatment to 4.5% (CI: 2% - 10%) post-treatment an 88% reduction. In contrast, levels of ELISA-detected anti-*Schistosoma* spp IgM and IgG to SEA were persistently high, with overall prevalence increasing from 79.5% (CI: 70% - 85%) pre-treatment to 90.2% (CI: 83% - 94%) post-treatment. The pre-treatment average infection intensities for Sh and Sm decreased from 112 eggs/10 ml of urine and 91eggs/g of stool to 12 eggs/10 ml of urine and 24 eggs/g of stool respectively. The average egg reduction rates (ERR) were 89.6% and 73.7% for Sh and Sm respectively. IgG4 levels decreased significantly post-treatment for anti-SmSEA but increased significantly for anti-ShSEA, reflecting differences in chronic antigen exposure. IgE levels increased significantly across anti-ShSEA, anti-ShAWA, anti-SmSEA, and anti-SMAWA post-treatment, highlighting heightened immune response to *Schistosoma* spp. antigens released during parasite destruction.

These findings support the critical role of MDA programs in schistosomiasis control however, the contrasting prevalence results by the two diagnostic tests suggest the need for improved diagnostic tests for the assessment of schistosomiasis MDA campaigns in endemic communities. Indicators such as ERR and infection intensities and immunological parameters such as population-level IgE and IgG4 must be factored into the overall evaluation of MDA campaigns.

KEYWORDS

Schistosomiasis; Praziquantel; Mass Drug Administration; Immunological Response; Ghana

FINANCIAL SUPPORT

