

Effect of *Schistosoma haematobium* infection on the cognitive functions of preschool age children and benefits of treatment from an endemic area in Zimbabwe

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Abstract

Background

Schistosomiasis is known to affect the cognitive functions of children, however, but there is paucity of information on its impact on early childhood development in developing countries where the disease is endemic. This study aimed at determining the effects of schistosomiasis due to *Schistosoma haematobium* on early childhood development in children below 5 years old from Murewa District, Zimbabwe, including the benefits of treatment.

Methods

Preschool age children (PSAC) under the age of 5 years were screened at baseline and at 6 months post-treatment for *S. haematobium* infections diagnosed using the urine filtration method. Cognitive domains were assessed using the Griffith Mental Developmental Scales III on 136 PSAC. Multivariate logistic regression was used to determine the level of association between *S. haematobium* infection and performance in the cognitive domains adjusting for confounding factors (i.e. nutrition, hemoglobin levels, gender and age). Median Development Quotient scores of each cognitive domain at baseline and at 6 months post-treatment were compared and quantified.

Results

After adjusting for confounding factors, PSAC infected with *S. haematobium* had greater odds of having lower scores in the Foundation of Learning Domain (OR = 3.9, $p = 0.008$), Language and Communication Domain (OR = 3.2, $p = 0.017$), Eye-Hand Coordination Domains (OR = 10.7, $p = 0.001$), Personal-Social-Emotional Domain (19.3, $p = 0.001$) and in the Overall General Development Domain (7.2, $p = 0.011$). Improvement of cognitive performance was observed at 6 months post treatment in the following Domains; Language and Communication Domain

(p = 0.003), Eye-Hand Coordination Domain (p = 0.02) and General Development Domain (p = 0.006).

Conclusion

The study showed that *S. haematobium* infection in PSAC is associated with lower cognitive scores in the Foundation of Learning, Language and Communication, Eye-Hand Coordination, Personal-Social-Emotional and in the Overall General Development domains. Our results strengthen the call for inclusion of PSAC in routine deworming programs for the control of urinary schistosomiasis and the need to develop locally validated tools to monitor early child development in endemic areas where resources are limited.