

No association between *Salmonella* intestinal carriage and *Schistosoma mansoni* infection in healthy individuals, Democratic Republic of the Congo

Absence d'association entre le portage intestinal de Salmonella et l'infection à Schistosoma mansoni chez des personnes en bonne santé, en République Démocratique du Congo

Mbuyi LK^{1,2}, Barbé B³, Madinga J^{5,6,8}, Roucher C⁵, Linsuke S^{6,7}, Hermy M⁵, Baloji S⁶, Anne-Sophie Heroes³, Nkoji G², Katja Polman⁵, Lutumba P^{5,6,7}, Phoba MF^{1,2}, Lunguya O^{1,2}, Jan Jacobs^{3,4}.

Summary

Background. In Sub-Saharan Africa, *Schistosoma* infection is mentioned as a risk factor for *Salmonella* carriage. We assessed the co-presence of intestinal *Salmonella* and *Schistosoma* in a rural site in the Democratic Republic of the Congo (DRC, Kifua II village, Kongo Central Province), endemic for *Schistosoma* infection and invasive salmonellosis.

Methods. From November 2015 to March 2016 (during the rainy season), healthy inhabitants aged ≥ 1 year were asked to give two consecutive stool samples after informed consent. Samples were assessed for *Salmonella* (culture with Selenite broth and *Salmonella*-*Shigella* agar) and *Schistosoma* eggs (microscopy, Kato Katz).

Results. Overall, 2,007 stool samples were collected from 1,108 participants (representing 88.6% of the population $n = 1,250$); median age (interquartile range (IQR)) was 15 (7-35) years. Half of participants ($n = 567$; 51.2%) were *Schistosoma mansoni* positive. *Schistosoma* egg load was light in 51% ($n = 291$), moderate in 31% ($n = 173$) and heavy in 18% ($n = 103$) of *Schistosoma*-infected participants. A total of 40 (3.6%) participants were found carriers of non-typhoidal *Salmonella*; none of the samples grew *Salmonella typhi*. Mean age \pm standard deviation of *Salmonella* carriers was 25 ± 19 years and did not differ from the non-*Salmonella* infected participants (22 ± 19 years, $p = 0.32$); male-to-female rates were 1:1.5 and 1:1.1 respectively ($p = 0.37$). *Salmonella* was isolated in similar proportions among *Schistosoma*-infected and non-infected participants (4.4% (25/567) and 2.8% (15/541) respectively, $p = 0.14$). Egg loads among *Salmonella*-*Schistosoma* co-infected participants were mostly light ($n = 12$; 48%) and heavy ($n = 9$; 36%). Follow-up of 17 *Salmonella* carriers revealed a single participant with repeat culture for *Salmonella*, 4 weeks after the initial sampling.

Conclusions. The present study, conducted in a rural area in DRC showed (i) *Salmonella* intestinal carriage rates of 3.6% which were (ii) not associated with *Schistosoma mansoni* intestinal infection.

Keywords: carriage rates, coinfection *Salmonella* – *Schistosoma*, DR Congo

1 Department of Clinical Microbiology, National Institute for Biomedical Research; Democratic Republic of the Congo

2 Service of Microbiology, University Hospital of Kinshasa, Democratic Republic of the Congo

3 Department of Clinical Sciences, Institute of Tropical Medicine, Antwerp, Belgium

4 Microbiology and Immunology, KU Leuven, Belgium

5 Department of Biomedical Sciences, Institute of Tropical Medicine, Antwerp, Belgium

6 Department of Epidemiology, National Institute for Biomedical Research; Democratic Republic of the Congo

7 Department of Tropical Medicine, University Hospital of Kinshasa, Democratic Republic of the Congo

8 Institute of Health and Society, Université Catholique de Louvain, Brussels, Belgium