An ultra-sensitive assay targeting the circulating anodic antigen for the diagnosis of Schistosoma japonicum in a low-endemic area, People's Republic of China

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 2803732
Author(s) van Dam, Govert J.; Xu, Jing; Bergquist, Robert; de Dood, Claudia J.; Utzinger, Jürg; Qin, Zhi-Qiang; Guan, Wei; Feng, Ting; Yu, Xin-Ling; Zhou, Jie; Zheng, Ma; Zhou, Xiao-Nong; Corstjens, Paul L. A. M.

Author(s) at UniBasel Utzinger, Jürg ;
Year 2015

Title An ultra-sensitive assay targeting the circulating anodic antigen for the diagnosis of Schistosoma japonicum in a low-endemic area, People's Republic of China

Journal Acta tropica

Volume 141

Number Pt B

Pages / **Article-Number** 190-197

Keywords Circulating anodic antigen (CAA), Diagnosis, Immunohaemagglutination assay, Kato-Katz technique, People's Republic of China, Schistosoma japonicum, Schistosomiasis, Up-converting phosphor lateral-flow assay

The downward trend in prevalence and intensity of Schistosoma japonicum infection in the People's Republic of China (P.R. China) has reached a level where accurate methods are required for monitoring the national schistosomiasis control programme and to verify whether transmission has been interrupted. We have assessed the prevalence of active S. japonicum infection by use of an up-converting phosphor lateral-flow (UCP-LF) assay for determination of circulating anodic antigens (CAA) in urine and serum, and compared the findings with those of the Kato-Katz technique for egg detection in stool and an immunohaemagglutination assay (IHA) for specific antibodies in serum. The study was carried out in three villages located in a remaining S. japonicum-endemic area in P.R. China. Overall, 423 individuals were investigated by Kato-Katz, 395 by IHA, 371 with the UCP-LF CAA assay adapted for urine and 178 with the UCP-LF CAA assay applied on serum. The IHA showed the highest number of positive results (n=107, 27.1%). The UCP-LF CAA urine assay detected 36 CAA positives (9.7%) and the serum-based CAA assay 21 positives (11.8%). The Kato-Katz technique revealed only six positive stool samples (1.4%). Among those 166 individuals with complete data records, sensitivities of the different assays were determined versus a combined 'gold' standard, showing the highest sensitivity for the urine CAA assay (93%), followed by the serum CAA (73%) and IHA (53%), whilst triplicate Kato-Katz thick smears had a very low sensitivity (13%). Serum CAA concentrations were about 10-fold higher than in urine and were significantly correlated. Highest prevalences as determined by CAA were found in older age groups (<40 years). Half of the CAA- or egg-positive cases were negative for antibodies by IHA, thereby revealing an important obstacle for the effectiveness of the current schistosomiasis control and elimination efforts. The significantly higher prevalence of active schistosome infection as shown by the urine and serum UCP-LF CAA assays has implications for the national control and elimination programme in P.R. China, particularly in respect to case-finding and intervention strategies.

Publisher Elsevier Science Publ.

ISSN/ISBN 0001-706X

Full Text on edoc No;
Digital Object Identifier DOI 10.1016/j.actatropica.2014.08.004
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/25128703
ISI-Number WOS:000347583200008
Document type (ISI) Article