Assessment of tegumental damage to Schistosoma mansoni and S. haematobium after in vitro exposure to ferrocenyl, ruthenocenyl and benzyl derivatives of oxamniquine using scanning electron microscopy

JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

ID 4487614
Author(s) Buchter, Valentin; Hess, Jeannine; Gasser, Gilles; Keiser, Jennifer
Author(s) at UniBasel Buchter, Valentin ; Keiser, Jennifer ;
Year 2018
Title Assessment of tegumental damage to Schistosoma mansoni and S. haematobium after in vitro exposure to ferrocenyl, ruthenocenyl and benzyl derivatives of oxamniquine using scanning electron microscopy
Journal Parasites and Vectors
Volume 11
Number 1
Pages / **Article-Number** 580
Schistosomiasis is one of the most harmful parasitic diseases worldwide, praziquantel being the only drug in widespread use to treat it. We recently demonstrated that ferrocenyl, ruthenocenyl and benzyl derivatives of oxamniquine (Fc-OXA, Rc-OXA and Bn-OXA) are promising antischistosomal drug candidates.; In this study we assessed the tegumental damage of these three derivatives of oxamniquine using scanning electron microscopy. Adult Schistosoma mansoni and S. haematobium were exposed to a concentration of 100 μM of each drug and incubated for 4-120 h, according to their onset of action and activity.; While on S. mansoni the fastest acting compound was Fc-OXA, which revealed high activity after 4 h of incubation, on S. haematobium, Rc-OXA revealed the quickest onset, being lethal on all males within 24 h. In both species studied, the three derivatives showed the same patterns of tegumental damage consisting of blebs, sloughing and tegument rupturing all over the body. Additionally, on S. mansoni distinct patterns of tegumental damage were observed for each of the compounds: tissue ruptures in the gynaecophoric canal for Fc-OXA, loss of spines for Rc-OXA and oral sucker rupture for Bn-OXA.; Our study confirmed that Fc-OXA, Rc-OXA and Bn-OXA are promising broad spectrum antischistosomal drug candidates. All derivatives show fast in vitro activity against S. mansoni and S. haematobium while validating the previous finding that the parent drug oxamniquine is less active in vitro under the conditions described. This work sets the base for further studies on the identification of a lead oxamniquine derivative, with the aim of identifying a molecule with the potential to become a new drug for human use.
Publisher BioMed Central
ISSN/ISBN 1756-3305
edoc-URL https://edoc.unibas.ch/66812/
Full Text on edoc Available;
Digital Object Identifier DOI 10.1186/s13071-018-3132-x
PubMed ID http://www.ncbi.nlm.nih.gov/pubmed/30400935
ISI-Number WOS:000449464500006
Document type (ISI) Journal Article