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EFFECT OF OXAMNIQUINE ON CELL ADHESION TO *SCHISTOSOMA MANSONI* LARVAE IN THE PERITONEAL CAVITY OF NAIVE MICE.

Alan Lane de MELO & Leógenes Horácio PEREIRA (1)

SUMMARY

The treatment of naive mice with high doses of oxamniquine, 1 hour before the intraperitoneal inoculation of *Schistosoma mansoni* cercariae, induces a delay in the transformation process resulting in a longer host cell adhesion.

KEY WORDS: *Schistosoma mansoni;* Cell adhesion; Cercaria; Schistosomulum; Oxamniquine.

INTRODUCTION

Since the observations of CRAM & BOZICEVICH (1944)[2] and YOLLES et al. (1949)[14], who described the *Schistosoma mansoni* development after intraperitoneal inoculation into laboratory animals, very little is known about the factors that involve the cercaria-schistosomulum transformation in this site.

The observations on the dynamics of the cercaria-schistosomulum transformation were carried out almost always *in vitro,* mainly due to the difficulties for direct *in vivo* observations[1,3,13]. Fast recovery of schistosomula from the peritoneal cavity of mice was reported by EVELAND (1972)[3]and PEREIRA et al. (1974)[11].

Besides the studies on the cercaria-schistosomulum transformation[5,6,7,8], we reported host-cell adhesion to different larval stages of the parasite[4,9]. In this paper, the kinetics of the transformation process *in vivo* received additional investigation, using oxamniquine (an antischistosomal compound) that also produces a delay in the time required for cercaria-schistosomulum transformation[8].

MATERIAL AND METHODS

Albino mice (males, weighing 18-22 g) were inoculated (i.p. route) with *Schistosoma mansoni* cercariae (LE strain) shed by laboratory reared and infected *Biomphalaria glabrata* (Belo Horizonte strain), one hour after intramuscular administration of oxamniquine.

Doses of 500; 1,000; 2,000 and 4,000mg/kg were given to various groups of five animals each. Untreated mice served as controls. (The cercariae were concentrated by the method of PELLEGRINO and MACEDO[10], and 0.5ml of well water containing about 500 cercariae was injected intraperitoneally with a Cornwall syringe, supplied with a 20 x 10 gauge needle).

The mice were killed by cervical dislocation 30, 60, 90, 120, 150, 180 minutes after cercarial inoculation. The larvae were collected by washing the peritoneal cavity with saline, and were concentrated by centrifugation according to PEREIRA et al.[11]. The recovered larvae, resuspended in 1 ml of saline, were examined under a dissecting stereomicroscope and were counted as larvae (tailed or tailless), with or without adherent host cells. For parasite countings, 240 naive mice inoculated with cercariae were used: five mice per group at each time after inoculation, ranging from 30 to 180 minutes. Recovered organisms were tested for water intolerance by adding 5ml of water to the Petri dishes containing the recovered larvae in 1 ml of saline.

RESULTS AND COMMENTS

Cell adhesions to the larvae were observed in both the treated and untreated groups of

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(1) Departamento de Parasitologia Instituto de Ciências Biológicas da UFMG, CP 2486, CEP 30161-970, Belo Horizonte, Minas Gerais, Brasil.

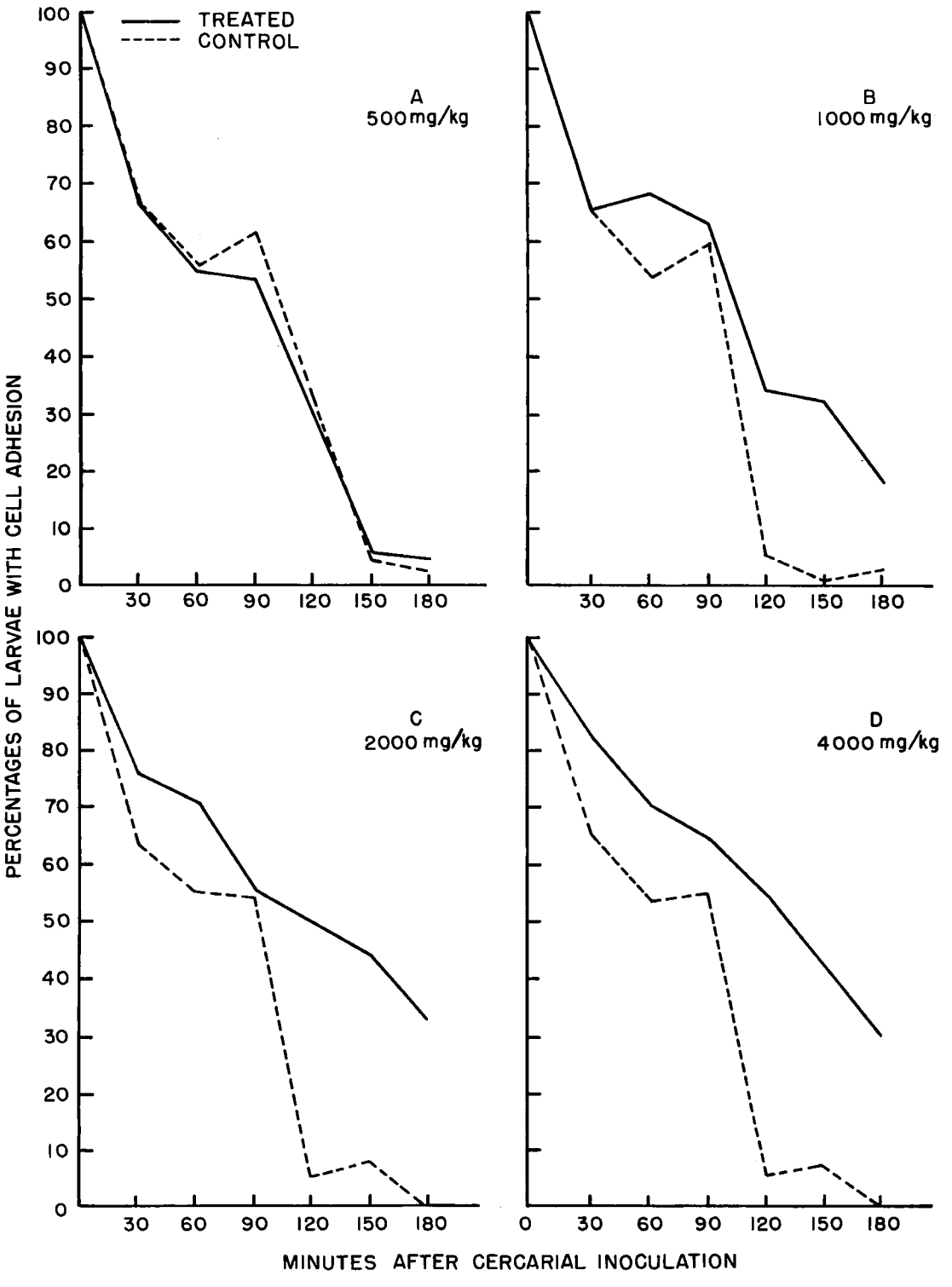

Fig. 1 - Effect of oxamniquine on cell adhesion to *Schistosoma mansoni* larvae, *in vivo*. Different doses of the compound were given 1 hour prior to infection. Larvae recoveries were performed 30 to 180 minutes after cercarial inoculation.

animals. After 90 minutes, cell adhesions on larvae in the untreated mice decreased significantly, and after 3 hours adhesions occurred in very low percentages in contrast with the treated animals (Fig. 1).

Statistical comparison of the percentages of cell attachment to organisms in various groups at different times after inoculations revealed significant differences between treated (1,000 to 4,000 mg/kg) and untreated groups ($p<0.01$). As a general rule, cells were firmly adherent to the organisms and were not dislodged during the preparation of smears. Sometimes single cells adhered to schistosomula-like organisms (tailless cercariae), but clumps of adherent cells were often seen. A total coating of the cercaria with adherent cells was not uncommon. Most cells were attached to the tail.

The persistence of the host-cell adherence to the larvae recovered from treated mice can be explained by a delay of the transformation process[8], already reported when large doses of oxamniquine are given[6,7].

The evidence which supports this notion comes from the finding that the host cell could bind to surface of the infective larvae at the time of cercarial inocula[9], and their progressive detachment when cercaria changes to schistosomulum[4]. So, confirming this assumption, the treatment with oxamniquine, producing a delay in the transformation process, results in a longer host cell adhesion.

The mechanism by which host cell remains adhered to the larvae cannot be ascertain from this study, however the experimental evidence described herein supports the hypothesis that surface structures of the parasite, that are lost during the transformation process (mainly the glycocalyx)[12,13], may directly be implicated in this process.

RESUMO

Efeito da oxamniquina sobre a adesão celular da larva do *S. mansoni* na cavidade peritoneal de camundongos.

O tratamento de camundongos sem infecção prévia com altas doses de oxamniquina, 1 hora antes do inóculo intraperitoneal com cercárias de *Schistosoma mansoni,* induz a um atraso no processo de transformação, resultando conseqüentemente em larvas com adesão celular mais duradoura.

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