IN VIVO ACTIVITY OF DIHYDROARTEMISININ AGAINST SCHISTOSOMA MANSONI SCHISTOSOMULA IN MICE

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Abstract. Dihydroartemisinin, an anti-malarial agent, has been shown to exhibit activity against Schistosoma japonicum and S. mansoni. The purpose of the present study was to investigate the in vivo activity of dihydroartemisinin against juvenile S. mansoni and the changes to the genital system among worms surviving drug treatment. Mice were infected with 200 S. mansoni cercariae each and randomly assigned to groups. Dihydroartemisinin at a single oral dose of 300 mg/kg was given to mice on Days 14 or 16, 18, 20, 21, 22, 24, 26 or 28 post-infection, to assess the efficacy of dihydroartemisinin against juvenile S. mansoni. Mice were treated with dihydroartemisinin using various protocols with the total drug dose of 900 mg/kg, to investigate the efficacy of dihydroartemisinin against the schistosomula of S. mansoni. In addition, changes to the genital system among worms surviving dihydroartemisinin treatment, were recorded. An oral dose of dihydroartemisinin of 300 mg/kg was given to mice on Days 14, 16, 18, 20, 21, 22, 24, 26 or 28 days post-infection; this resulted in a 65.0-82.4% reduction in total worm burden and a 70.9-83.0% female worm burden. Better results were seen when treatment was given 20-24 days post-infection. Administration of multiple-dose and low-oral-dose dihydroartemisinin (at doses of 90, 180, 300 and 450 mg/kg) at different times, reduced total worm burdens by 88.7-99.1% and female worm burdens by 93.2-99.5%. The egg tubercles in mice livers were significantly reduced following treatment; in some mice no egg tubercles were found. These findings indicate dihydroartemisinin exhibits high in vivo activity against the schistosomula of S. mansoni. It causes damage to the genital system of worms, influences the development of S. mansoni worms, reduces the oviposition of surviving worms and enhances the formation of granulomas around tissue-trapped eggs, thereby reducing damage to the infected mammalian host.

Keywords: Schistosoma mansoni, dihydroartemisinin, schistosomula, in vivo effect, genital system, mice