Determination of Efficacious Praziquantel Dose in Treatment of *Schistosoma mansoni* in BALB/c and Swiss mice

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ABSTRACT

Schistosomiasis is a parasitic disease second to malaria affecting humans in tropics and sub-tropics. The disease condition varies in severity depending on parasite species and strain, organ system infected, geographical region, genetic constitution of the individual and nutritional status. The drug Praziquantel has been the drug of choice for the treatment of schistosomisias however the effective dose 450 mg/kg body weight that is currently being used is not able to clear the worms completely .This work sought to determine the effective dose of praziquantel in different mouse strains, of which the results can be applied in human treatment. Experimental groups comprising of twelve mice and eighteen for the infected control groups were designed for both BALB/c and Swiss mice. At four weeks post infection, mice were treated with varying dosages of Praziquantel namely PZQ1350, PZQ900, PZQ450 mg/kg body weight. At week 6 all mice were perfused to recover adult worms. Gross pathology and histopathology of the liver tissues were examined. Serum samples were collected to determine immunological responses in all the groups at week 4 and 6. Schistosomule Soluble Protein (SSP) and Schistosome Warm Antigen Preparation (SWAP) specific antibody ELISA were done. Results indicated that in the experimental groups PZQ1350 mg/kg body weight had few numbers of worms recovered in BALB/c and Swiss mice of 30.30% and 34.08% respectively and a high worm reduction of 69.70% and 65.92% respectively.The SSP and SWAP specific IgG responses of PZQ 1350 mg/kg body weight was statistically significant $p<0..001$ compared to other groups due to synergistic effect between the drug and the immune responses. Granuloma formation was greatly reduced in PZQ 1350mg/kg body weight group in comparison to other treatments. The findings of this study imply that the higher the dosage of Praziquantel the more the protection against *Schistosoma mansoni* infection since PZQ1350 indicated more effective responses in worm recovery, worm reduction, immunological response and pathology reduction compared to other dosages. These results may be incorporated into the design of a more effective dose; however the toxicity of the high dose should be investigated. The findings also indicate that Swiss mouse was a better permissive host than BALB/c as it allowed more parasites to mature instead of destroying them, hence a better model in Schistosomiasis experimental studies.