Triclosan and triclosan-loaded liposomal nanoparticles in the treatment of acute experimental toxoplasmosis

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The efficacy of triclosan (TS) and TS-loaded liposomes against virulent strain of Toxoplasma gondii (T. gondii) was evaluated. Swiss albino mice were intra peritonealy infected with 10^4 tachyzoites of RH HXGPRT (-) strain of T. gondii, then were orally treated with 150 mg/kg TS or 100 mg/kg TS liposomes twice daily for four days. Mice mortality, peritoneal and liver parasite burdens, viability, infectivity and ultra structural changes of peritoneal tachyzoites of infected treated mice were studied, in comparison to these of infected non-treated controls. Drug safety was biochemically assessed by measuring liver enzymes and thyroxin. Both TS and TS liposomes induced significant reduction in mice mortality, parasite burden, viability and infectivity of tachyzoites harvested from infected treated mice. Scanning electron microscopy of treated tachyzoites showed distorted shapes, reduced sizes, irregularities, surface protrusions, erosions and peeling besides apical region distortion. Transmission electron microscopy showed that treated tachyzoites were intra cellularly distorted, had cytoplasmic vacuolation, discontinuous plasma membranes, nuclear abnormalities and disrupted internal structures. Besides, in TS liposomes-treated subgroup, most tachyzoites were seen intra cellularly with complete disintegration of the parasite plasma and nuclear membranes, with complete destruction of the internal structures. Biochemical safety of TS and TS liposomes was proven. Accordingly, TS can be considered as a promising alternative to the standard therapy for treating acute murine toxoplasmosis. Liposomal formulation of TS enhanced its efficacy and allowed its use in a lower dose.

Combination of the two schistosomal antigens Sm14 and Sm29 elicits significant protection against experimental Schistosoma mansoni infection

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Background: Schistosomiasis continues to be a serious helminthic disease that is widespread in many regions in the world. Disease management relies mainly on early treatment with praziquantel, nevertheless, re-infection rates can still be high. An effective vaccine against Schistosoma mansoni is still lacking; a situation which hinders the efforts to eradicate the disease worldwide. Most investigators test S. mansoni antigens individually, rather than in combination, in their vaccine trials. A single-antigen vaccine is likely to elicit less protection against schistosomiasis than a multi-antigen vaccine. In the current study, we have selected two promising S. mansoni antigens, Sm14 and Sm29, and investigated their combination as a potential vaccine.

Methods: Recombinant Sm14 and a truncated form of Sm29, designated TrSm29, were successfully expressed in Escherichia coli. The two antigens were purified using affinity chromatography and administered to Swiss albino mice individually and in combination.

Results: Significant protection against S. mansoni infection was observed in mice immunized with the Sm14/TrSm29 combination in the presence/absence of the immuno adjuvant poly (I:C). The poly (I:C)-adjuvanted combination resulted in 40.3%, 68.2%, and 57.9% reduction in adult worm burden, liver egg burden and intestinal eggs, respectively. Granuloma size and count were also reduced besides improvement of the histopathological picture of livers of immunized mice.

Conclusion: This study demonstrates the importance of using multi-antigen vaccines as an effective and simple approach to fulfill enhanced protection against schistosomiasis.