INTERNATIONAL JOURNAL OF CANCER AND BIOMEDICAL RESEARCH (IJCBR)

THESIS ABSTRACT

Beneficial prophylactic effects of poly(I:C) and zymosan against *Schistosoma mansoni* infection

Samah K. Nasr Eldeen[1], Wafaa M. Ibrahim[2], Afrah Salama[3] and Mohamed L. Salem[4]

[1]Central Laboratories, Egyptian Ministry of Health, Tanta, Egypt
[2]Medical Biochemistry Department, Faculty of Medicine Tanta University, Egypt
[3]Chemistry Department, Faculty of science Tanta University, Egypt
[4]Zoology Department, Faculty of Science, Tanta University, Egypt

Background: The use of vaccination in the control of schistosomiasis at a population level induced low cure rates and also resistance to drugs has been recently recorded in Egyptian patients. For these reasons, a search for new drugs with adjuvant and anti-schistosomal activity is urgently needed. **Aim**: The study focused on newly synthesized ligands that play a central role as inducers of innate and adaptive immune responses and are therefore considered as potential targets for vaccine adjuvants. These ligands include Polyinosinic: polycytidylic acid (Poly (I:C) (TLR3L) and zymosan (TLR2L) which have displayed an impressive array of biological activities including antitumor and antiviral effects. The present study investigated their adjuvant and anti-schistosomal effects in *S. mansoni*-infected mice. **Materials and Methods:** The study was divided into two experimental settings including the vaccination and treatment settings. In the vaccination settings, the mice were assigned into 8 groups. Mice were vaccinated with the ligands 2 times at 2 weeks intervals, then infected with *S. mansoni*. Five weeks post-infection, the mice were euthanized for analysis. In the non-vaccination settings, the mice were assigned into 8 groups. The determination of worm burden, tissue eggs count, assessment of liver function tests, and parameters of oxidative stress were done. **Results**: Vaccination and treatment by Poly (I:C) and Zymosan increased the counts of platelets, segmented neutrophils, eosinophils, and monocytes while decreases the lymphocytes count, indicating to the immunological effect of these ligands. The current study showed that Poly (I:C) and Zymosan displayed an adjuvant with soluble worm antigen protein (SWAP) antigen that associated anti-schistosomal activity and with improvement in the liver enzymes and oxidative stress as compared to the vaccination with SWAP antigen alone. These ligands also showed an apparent effect on the granuloma volume. These TLR ligands had no side effects on normal healthy mice and reduced the adverse effects caused by *S. mansoni* through the improvement of liver enzymes, oxidative stress, reduction of worm burden, and ova count. **Conclusion**: This study is the first study that assesses TLR ligands as adjuvants and treatment for *S. mansoni* infection. Our recommendation is to use vaccination and increase the treatment time of both ligands for significant reduction of worm and ova to preserve normal liver function parameters.

Keywords: PolyI: C; Zymosan; SWAP antigen; Adjuvant; S. mansoni

Editor-in-Chief: Prof. M.L. Salem, PhD - Article DOI: 10.21608/JCBR.2021.57652.1115