Schistosoma mansoni infection and hepatocellular carcinoma in Egypt

Thesis

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بسم الله الرحمن الرحيم

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا

إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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Yosra Nabil

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List of Abbreviations

- **Ab** : Antibody.
- **CAgs:** Circulating antigens.
- **CD**: Cluster of differentiation.
- **CHR:** Cercarial hullen reaction.
- **CIET**:Counterimmunoelectrophoresis test.
- **CLD**:Chronic liver disease.
- **CMI**:Cell mediated immunity.
- **COP**: Circumoval precipitin test.
- **CT**: Computed tomography.
- **ECM**:Extra cellular matrix.
- **EITB**: Enzyme immunoelectrotransfer blot.
- **ELISA**: Enzyme-linked immunosorbent assay.
- **EM:** Electron microscope.
- **HBV**: Hepatitis B virus.
- **HCV**: Hepatitis C virus.
- **HCC**: Hepatocellular carcinoma.
- **HRP:** Horseradish peroxidase.
- **HPC**: Histopathologic changes.
- **HSCs**: Hepatic stellate cells.
- **IARC**: International Agency for Research on Cancer

- **IFAT**: Indirect immunoflurescent antibody test.
- **IFN:** Interferon.
- **IgE**: Immunoglobulin E.
- **IgG**: immunoglobulin G.
- **IgM**: Immunoglobulin M.
- **IHAT**: Indirect haemagglutination test.
- **IL**: Interleukin.
- **KDa**: Kilo Dalton.
- **KS:** Katayama Syndrome.
- **LCD**: Large cell dysplasia.
- **MC:** Mast cells.
- **MRI**: Magnetic Resonance Imaging.
- **MT**:masson trichrome.
- **nm**: Nanometer
- **PCR**: Polymerase Chain Reaction.
- **PGE1**: Prostaglandin E1.
- **Pzq**:praziquantel.
- **ROS, RNOS**: Reactive oxygen and nitrogen species.
- **SCD**: Small cell dysplasia.
- **SEA**: Soluble egg antigen
- ***S.haematobium****:Schistosoma haematobium*.
- ***S.japonicum:***Schistosoma japonicum.
- ***S. mansoni :*** *Schistosoma mansoni.*

- **Th**: T helper.
- **TMB**: Tetramethylbenzidine.
- **TNF:** Tumor necrosis factor**.**
- **T reg**: Regulatory T-cells.
- **IDT:** Intradermal test.
- **WHO**: World Health Organisation.

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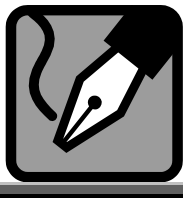


Abstract

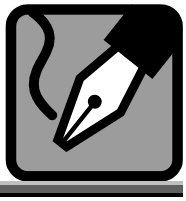
ABSTRACT

Schistosomiasis is the second most common parasitic infection of humans after malaria. In Egypt, schistosomiasis was traditionally one of the most important public health problems and infection with *S. mansoni* was the major cause of liver disease. In the past 10 years, hepatocellular carcinoma (HCC) was considered a major public health problem in Egypt, with a doubling in its incidence rate in this period. The rising incidence of HCC has been associated with increased prevalence of HCV infection, that was directly associated with intravenous tartar emetic used to control schistosomiasis from 1950s to 1980s. Currently, most Egyptian patients with chronic hepatitis, cirrhosis or HCC have co-infection of schistosomiasis and HCV. Literature had demonstrated that the association between *S.mansoni* and HCC is probably an indirect one, through potentiating the effect of hepatitis virus on the liver. However the role of isolated *S. mansoni* as a risk factor for the development of HCC is inadequately studied. In this study the role of isolated *S. mansoni* infection as a risk factor for development of HCC in Egypt was investigated. The current study included both parasitological and serological analysis that were conducted on 60 patients with HCC attending the outpatient clinic of medical oncology in health insurance hospitals in Fayoum governerate, performing stool examination and ELISA IgG antibody level for all 60 patients and 20 control group. Within HCC cases 26.7% (16/60), and 33.3% (20/60) suffered pure chronic schistosomiasis and pure Hepatitis C (HCV) infections respectively, with no statistically

significant differences (p=0.37), indicating comparable risk value of both infections in predisposing directly to HCC. Additionally; frequency of HCC patients with assumed potentiated HCV infection by chronic *Schistosoma mansoni* 6.7% (4/60) were statistically significant (p<0.05), when compared to HCC patients proceeded by either pure chronic schistosomiasis 26.7% (16/60) or pure HCV infection 33.3% (20/60).This indicated the presence of direct relationship between chronic schistosomiasis and HCC and other factors led to development of HCC patients and not only through potentiation of the effect of viral hepatitis on the liver.

Key words: *Schistosomiasis mansoni* - Hepatocellular carcinoma - Hepatitis C virus

N.B: The abstract is accepted and presented in the XI European Multicolloquium of Parasitology (EMOP XI), cluj-Napoca, Romania.



Introduction & Aim of the Work

INTRODUCTION

Schistosomiasis is a water-borne trematode infection that is endemic in 76 countries 46 of which are in Africa. About 207 million people are infected with 120 million people showing symptoms and 20 million severely ill **(Leonardo et al., 2012)**. In Egypt, the incidence of this illness is still high inspite of the considerable effort to eradicate the disease. Sixty percent of the Egyptian population is at risk of infection. Children of school age are especially at risk because of their daily contact with infected water in rural areas **(Mostafa et al., 1999).**

In Egypt, schistosomiasis was traditionally one of the most important public health problems and infection with *S. mansoni* was the major cause of liver disease. From the 1950s until the 1980s, the Egyptian Ministry of Health (MOH) undertook large control campaigns using intravenous tartar emetic, the standard treatment for schistosomiasis, as community-wide therapy. This commendable effort to control a major health problem unfortunately established a very large reservoir of hepatitis C virus (HCV) in the country **(Strickland, 2006).**

Recent advances in the fields of molecular biology, epidemiology and infectious diseases have led to significant revelations to clarify the relationship between cancer and infective agents (**Khurana et al., 2005).**