

***Schistosoma mansoni* infection and  
hepatocellular carcinoma in Egypt  
Thesis**

**Submitted to Faculty of Medicine, Cairo university for Partial  
Fulfillment of the M. S.C degree in Medical Parasitology**

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**2012**

## **SUMMARY AND RECOMMENDATIONS**

The aim of the present study was to clarify the association between chronic schistosomiasis and hepatocellular carcinoma based on both immunological and clinical data. The present study was cross-sectional prospective study performed over the period from December 2010 to May 2012. This study was carried out on patients with hepatocellular carcinoma (HCC) with a history of chronic schistosomiasis *mansoni* or acute on top of chronic schistosomiasis. The study work was conducted on 60 cases with hepatocellular carcinoma and 20 control group. This study was carried out on patients attending outpatient clinic or inpatients of medical oncology in health insurance hospital in Fayoum governorate. Parasitological and serological analysis were done, performing stool examination and ELISA for all cases and control group in this study. ELISA was done according to (Deelder et al., 1989) for detection of serum immunoglobulin G antibody level using commercially available kits in which SEA Antigens were applied. Stool analysis applying direct and concentrated techniques was done in health insurance hospitals in Fayoum, while ELISA technique was done in parasitology department, El-Kasr El-aini, Faculty of Medicine, Cairo university. And cases were classified into the following groups:

- **Group I:** Cases of HCC with history of chronic *Schistosoma mansoni* or acute on top of chronic *Schistosoma mansoni*.
- **Group II:** Cases of chronic schistosomiasis without HCC.

- **Group III:** Healthy persons.

All patients were subjected to clinical and ultrasonographic examination. A comprehensive questionnaire was administered by the investigator to all individuals who consented to participate in the study. The questionnaire elicited demographic data (age, sex, residency, amongst others), experiences (history of contact with canal water, history of schistosomiasis *mansoni*, history of receiving treatment for schistosomiasis.... etc) and risk factors (e.g. history of hepatitis B or hepatitis C and related treatment such as interferon).The confirmatory data was added for different individuals (e.g. Hepatitis infection was confirmed by quantitative Real time PCR (RT- PCR) reaction and by reports of SONAR- histopathological reports). For all patients with hepatocellular carcinoma, tumor size and tumor site (in which lobe, right or left or both) were added (known by files of the patients and available investigations).

Among the study group 56.6% (34/60) were dweller in rural and 43.4% (26/60) resident in urban areas in Fayoum governorate. Patients' age ranged from 45- 70 years old and 90% (54/60%) of patients were males and 10% (6/60) were females. Clinical and ultrasonographic examination was done for all HCC cases. Hepatosplenomegaly was recorded in 30 cases (50%), while hepatomegaly only was noticed in -the other 30 cases (50%). History

of bilharziasis was reported in 20 cases (33.3%), while 40 patients (66.7%) were HCC cases without history of bilharziasis.

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).

SO, from the previous results we can reach some conclusions:

- 1- There is possible direct relationship between *Schistosoma mansoni* & hepatocellular carcinoma.
- 2- There is an initial indication of equal risk value of both human chronic *Schistosoma mansoni* infection and hepatitis C viral infections in precipitating hepatocellular carcinoma among Egyptian patients.
- 3- There are other factors precipitating hepatocellular carcinoma in patients with schistosomiasis and not only through potentiation of viral hepatitis effect on the liver.
- 4- Passing through different phases of granuloma formation, the amount of antigens and toxins released from the eggs and the severity of chronic fibro-obstructive disease along with the



subsequent genetic changes may explain the occurrence of hepatocellular carcinoma in patients with *Schistosoma mansoni*.

## **RECOMMENDATIONS**

Further studies must be done at the genetic level to complete this study, and to give more explanation about the relation between hepatocellular carcinoma and *Schistosoma mansoni*.

- Further studies including larger number of patients in different regions to ensure our results.
- Any patients with chronic schistosomiasis and hepatosplenomegaly ,especially those who acquired infection in childhood and whom shistosomiasis insult will have the chance to affect their livers a longer period of time must be followed up for fear of earlier development of HCC.
- Further investigations must be conducted for the development of a schistosomiasis vaccine that target school children, who are at higher risk for infection and are more vulnerable to the development of HCC due to acquiring infection at young age.
- According to the WHO recommendations that all countries should incorporate HBV vaccine into their routine program by 1997, HBV vaccination was discussed to be implemented in the national immunization programmes.
- In the absence of vaccination for hepatitis C, vaccination for schistosomiasis should be also implemented in the national immunization programs in order to decrease the risk of

development of hepatocellular carcinoma among coinfecting patients.