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Insulin like growth factor-1, cholesterol, and some metals as markers for hepatocarcinogenesis in Egyptian patients with hepatitis C infection

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وَالْبَصَرِ السَّمْعِ السَّمْعِ

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Declaration

This thesis has not been submitted for a degree at this or any other university.

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Dedication

*This work is dedicated to my lovely Family.
Thank you for your unconditional support
with my studies and for giving me a chance to
prove and improve myself.*

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Abstract

Background: The prevalence of serological markers of viral hepatitis C (HCV) infection in patients with hepatocellular carcinoma (HCC) is nearly 80%. However, the differential diagnosis between chronic hepatitis C (CHC) and HCC in early stages is a challenge. Manifestation of the malignant potential of the neoplastic cell requires cellular metabolic alterations to provide the bioenergetic, synthetic, and catabolic requirements of malignancy.

Aim: To investigate the direct and indirect metabolic effects of HCV on glucose homeostasis, lipid profile, iron overloading profile, zinc, and copper, and their relation to the development of HCC.

Subjects: Sixty non-diabetic male patients with CHC, were included in this study, 30 of them with proven diagnosis of HCC. Twelve matching healthy subjects were chosen as control group.

Methods: Routine blood tests included blood picture, liver function panel, lipid profile, glucose homeostasis, and markers of metabolic alterations (including IGF-1, Leptin, and TAOC), inorganic elements, and creatinine.

Abstract

Results: All patients showed higher Homeostasis model assessment for insulin resistance (HOMA-IR), liver enzymes, bilirubin, creatinine, leptin, iron, and ferritin, compared to controls. Markers that significantly differentiated HCC from HCV (from ROC curve) were an increase in Cu/Zn ratio, AFP, IGF-1 and Forns index, and a decrease in zinc, albumin, A/G ratio and leptin.

Conclusion: The overall metabolic alterations during HCV infection play an essential role in carcinogenesis. In addition, the global changes of metabolites that arise during, or as a consequence of tumorigenesis, could measure both the presence and the severity of disease. Association of decreased leptin and Zn, with increase in IR, Cu/Zn ratio and IGF-1 indicates HCC development. Therefore, the utility of these simple, non-invasive, potential biomarkers as predictors for HCC development could be valuable in Egyptian chronic HCV patients.

Key words: Hepatocellular carcinoma, chronic hepatitis C, insulin resistance, insulin like growth factor-1, copper, leptin, and zinc

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