

# **Serum Level of Omentin-1 in Hepatitis C Decompensated Liver Disease with and without Diabetes Mellitus**

**Thesis**

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سبحانك لا علم لنا  
إلا ما علمتنا إنك أنت  
العليم الحكيم

صدق الله العظيم

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*"To my dear **Father** for his help and to my beloved **Mother** and my **brothers** for their care and support*

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## *List of Abbreviations*

Abb.	Full term
AFP .....	Alpha feto protein
AKT.....	Tyrosine Kinase Activator
ALT .....	Alanine aminotransaminase
AST .....	Aspartate aminotransaminase
BMI .....	Body mass index
CBC.....	Complete blood count
CHC .....	Chronic Hepatitis C
CLD.....	Chronic Liver Disease
CRP .....	C-reactive protein
CTP .....	Child Turcotte Pugh
CVD .....	Cardiovascular disease
DAAAs .....	Direct acting agents
DL .....	Decileter
DM .....	Diabetes mellitus
DPP-4 .....	Dipeptidyl Peptidase-4 Inhibitors
EASL.....	The European Association for the Study of the Liver
EDTA.....	Ethylenediamine Tetra-Acetic Acid
EIA .....	Enzyme-linked immunoassays
ELISA .....	Enzyme linked immunosorbant assay
EORTC .....	The European Organization for Research and Treatment of Cancer
FDA.....	Food and Drug Administration
FPG.....	Fasting plasma glucose
FPS .....	Fasting plasma sugar
GDM .....	Gestational diabetes mellitus
GFR .....	Glomerular filtration rate
GH.....	Glycogenic Hepatopathy
GLP-1.....	Glucagon-like peptide-1
Hb .....	Haemoglobin
HBsAG.....	Hepatitis B surface antigen
HBV .....	Hepatitis B virus
HCC .....	Hepatocellular carcinoma

## *List of Abbreviations cont...*

Abb.	Full term
HCV Ab.....	Hepatitis C virus antibody
HCV .....	Hepatitis C virus
HD .....	Hepatogenous diabetes
HDL .....	High density lipoprotein
HE .....	Hepatic encephalopathy
HIV .....	Human immunodeficiency virus
HOMA IR .....	Homeostasis Model Assessment of insulin Resistance
HRS.....	Hepato Renal Syndrome
IFG .....	Impaired fasting glucose
IGT.....	Impaired glucose tolerance
IL-6 .....	Interleukin-6
INR .....	International Normalized Ratio
IR .....	Insulin Resistance
IU .....	International unit
Kg.....	Kilogram
L.....	Liter
LDL.....	Low density lipoprotein
MELD .....	Model for end-stage liver disease
mg .....	Milligram
mL.....	Milliliter
NAFLD .....	Non-alcoholic fatty liver disease
NS5 .....	Nonstructure viral protein 5
OGTT.....	Oral glucose tolerance test
PCOS .....	Polycystic ovary syndrome
PCR.....	Polymerase chain reaction
PEG-IFN .....	Pegylated interferon
PG .....	Plasma glucose
PI3K.....	Phosphatidylinositol 3 kinase
PLT .....	Platelets
PT.....	Prothrombin time
RIBA .....	Recombinant immunoblot assay
RNA .....	Ribonucleic acid

## *List of Abbreviations cont...*

Abb.	Full term
ROC .....	Receiver operating characteristic
ROS.....	Reactive oxygen species
SBP .....	Spontaneous Bacterial Peritonitis
SD .....	Standard Deviation
SGLT 2 .....	Sodium glucose co-transporter 2
SVR.....	Sustained virological response
T2DM.....	Type 2 diabetes mellitus
TNF .....	Tumor necrosis factor
TNF .....	Tumor necrosis factor
TZDs .....	Thiazolidinediones
US .....	Ultrasonography
USA.....	United State of America
WBC.....	White blood cell
WHO .....	World Health Organization

## **Abstract**

In the current study, there was no significant association between serum omentin level and age or gender in CLD patients.

BMI and body weight were found to be inversely correlated with serum omentin level. Fasting blood sugar and HbA1c were found to be negatively correlated with serum omentin level.

We reported a significant +ve correlation between serum omentin level and severity of liver disease according to Child-Pugh score.

We found no significance of HCC or serum level of creatinine on the serum level of omentin.

**Keywords:** Hepatogenous diabetes -Hepatitis C virus -High density lipoprotein -Impaired glucose tolerance-Interleukin-6

## INTRODUCTION

The liver is a vital organ, it has a wide range of functions, including detoxification, protein synthesis, and production of biochemicals necessary for digestion. The liver is necessary for survival; there is currently no way to compensate for the absence of liver function in the long term, although new liver dialysis techniques can be used in the short term (*Cotran et al., 2005*).

Hepatitis C virus (HCV) is an enveloped, single stranded RNA virus of the family Flavi-viridae. It is of high prevalence and endemicity in Egypt and is considered the most important cause of liver disease in Egypt. Infection with the hepatitis C virus causes inflammation of the liver and a variable grade of damage to the organ. Over several decades this inflammation and grade change can lead to cirrhosis. Among patients with chronic hepatitis C 10-20% will develop cirrhosis (*Friedman, 2014*).

There is a number of clinically important complications which often emerge in the course of advanced liver disease, independently of the underlying liver disease. When these complications are overt, it is called decompensated liver disease (*Rahimi and Rockey, 2011*).

Decompensated liver disease is a state of liver disease in which any of the following complications may be manifested and obvious on the patients such as bleeding varices, hepatic

encephalopathy, ascites, hepatorenal syndrome, spontaneous bacterial peritonitis or jaundice.

HCV infection as shown by many studies was demonstrated to be associated with Insulin resistance and type 2 diabetes development. Insulin resistance and type 2 diabetes during the course of HCV can indicate a more rapid progression of liver fibrosis and are considered independent predictors of impaired response to treatment. Patients with type 2 diabetes and insulin resistance are also at increased risk for HCC (*Hung et al., 2010; Petta et al., 2008*).

Successful treatment of HCV now is considered an important factor in reducing insulin resistance and reduction of incidence of new onset of type 2 diabetes and insulin resistance in HCV-infected patients. Antiviral treatment of HCV has been demonstrated to improve clinical outcomes and complications related to diabetes (*Arase, 2009*).

Omentin-1, a novel adipokine, which is highly expressed by visceral adipose tissue compared with subcutaneous adipose tissue. Omentin-1 was shown to be inversely correlated to insulin resistance and high blood glucose levels.

Recently, in vitro experiments demonstrated that treatment with recombinant omentin-1 enhances insulin-stimulated glucose uptake in human subcutaneous and omental adipocytes and thus, improving insulin sensitivity. Also, omentin-1 was shown to

trigger Akt signaling in both the absence and presence of insulin. Furthermore, omentin plasma levels and omentin gene expression in visceral adipose are decreased in obesity.

Moreover, omentin-1 was found to be elevated in patients with liver cirrhosis. And it was found to be high in patients with fatty liver disease.

However, the role of omentin-1 in the chronic hepatitis C and its metabolic consequences is not obvious yet.

This is the cause that led us to conduct the present study in which we investigated the levels of omentin-1 in sera of patients with HCV decompensated liver disease, with and without type 2 diabetes, and compared them with its levels in apparently healthy controls.