شبكة المعلومات الجامعية

التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم

HANAA ALY

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جامعة عين شمس

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قسم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار

HANAA ALY

Assessment of Carotid Atherosclerosis in Egyptian Chronic Hepatitis C Patients After Treatment by Direct Acting Antiviral Drugs.

Thesis

Submitted For Fulfillment Of Master Degree In Gastroentrology and Hepatology

By

Mostafa Mohamed Fikry Elhady Swailam

M.B.B.Ch.,

Under Supervision of

Prof. **Essam M bayoumy**

Professor of Gastroentrology and hepatology department, faculty of medicine,Ain Shams university

Dr. **Ahmed Samir Allam**

Lecturer of Gastroentrology and hepatology department, faculty of medicine,Ain Shams university

Dr. **Marwa Ahmed Mohamed**

Lecturer of Gastroentrology and hepatology department, faculty of medicine,Ain Shams university

Faculty of Medicine
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تحت إشراف

الأستاذ الدكتور/ **عصام بيومي**

أستاذ امراض الجهاز الهضمى والكبد

كلية الطب، جامعة عين شمس

الدكتور / **أحمد سمير علام**

مدرس أمراض الجهاز الهضمي والكبد

كلية الطب، جامعة عين شمس

الدكتورة / **مروة أحمد محمد**

مدرس أمراض الجهاز الهضمي والكبد

كلية الطب، جامعة عين شمس

كلية الطب

جامعة عين شمس

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قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

Dedication

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List of Abbreviations

AASLD	American association for study of liver diseases
AFP	Alpha-Feto Protein
AHA	American heart association
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
CAD	Carotid artery disease
CAS	Carotid Atherosclerosis
CBC	Complete blood count
CETP	Cholesteryl ester transfer protein
CIA	Chemiluminescence Immunoassay
CNS	Central Nervous System
CRP	C reactive protien
CTA	Computed Tomography angiography
CTP	Child Turcotte pugh
DAA	Direct Acting Antiviral
DCV	Daclatasvir
EASL	European association for study of the liver
EGF	Epidermal growth factor
EHIS	Egypt Heath Issues Survey
EHDS	Egypt Heath Disability Survey
EIA	Enzyme Immunoassay
ELISA	Enzyme-linked immune-sorbent assay
FDA	Food and Drug Administration
GFR	Glomerular filtration rate
HAV	Hepatitis A Virus
Hb	Hemoglobin
HBV	Hepatitis B Virus
HCC	Hepatocellular carcinoma
HCV	Hepatitis C Virus
HDL	High density lipoprotein
HIV	Human Immunodeficiency virus
ICA	Internal carotid artery
IDSA	Infectious disease society of America
IL	Interleukin
IMT	Intima media thickness
INR	International normalized ratio
IQR	Inter Quartile Range
LDL	Low Density Lipoprotein

MELD	Model of endstage liver disease
MMP	Matrix Metallo-protinase
MOHP	Ministry of Health and Population
MRA	Magnetic resonant angiography
NKC	Natural Killer cells
Peg-IFN	Pegylated Interferon
PDGF	Platelet derived growth factor
PI	Protease inhibitor
PT	Prothrombin time
PTT	Partial thromboplastin time
RBV	Ribavirin
RIBA	Recombinant Immuno-Blot Assay
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
SD	Standard deviation
SDH	Social determinants of health
SNP	Single nucleotide polymorphism
SOF	Sofosbuvir
SPSS	Statistical Program for Social Science
SVR	Sustained Virologic Response
TIA	Transient ischemic attacks
TLR	Tol Like Receptor
USA	United States of America
WBCs	White blood cells
USA	United States of America
WHO	World Health Organization

Introduction

Hepatitis C virus (HCV) infection is one of the main causes of chronic liver disease as there are approximately 71 million chronically infected individuals worldwide **(Blach et al., 2017)**.

HCV infection affects cholesterol homeostasis and despite of its association with a decrease in serum concentrations of total cholesterol, LDL-C and apolipoprotein B (apoB —the main protein constituent of LDL and very-low-density lipoprotein (VLDL) an it was found that chronic HCV is associated with increased risk of atherosclerosis and its clinical manifestations **(Bassendine et al., 2013; Ampuero & Romero-Gómez, 2015).**

The risk for coronary artery disease increases with HCV-infected individuals. Also, myocardial perfusion defects have been found in 87% of the patients with chronic hepatitis C, which improved with viral eradication **(Roed et al., 2006; Maruyama et al., 2013)**.

The carotid arteries are among the commonest sites of atherosclerosis, manifesting as cardiovascular disease, stroke and other diseases. Of the two major stroke subtypes, ischaemic stroke is generally the more common and is mainly due to carotid atherosclerosis **(Arenillas, 2011)**.

The mechanisms suggested for carotid atherosclerosis were a chronic immunological challenge and the production of pro-inflammatory cytokines. Persistent infection disturbs the balance between immunostimulation and inhibitory cytokines, which could thus maintain a significant level of inflammation. The alteration in the cytokine balance observed in patients with chronic hepatitis C could result in these cardiovascular complications (**Domont & Cacoub, 2016**).

Carotid intima-media thickness (IMT) has been used as a surrogate of sub-clinical atherosclerosis and studies have shown that, after adjustment for classical cardiovascular risk factors, those with chronic HCV infection have raised IMT **(Mostafa et al., 2010)**.

The recent introduction of direct-acting antivirals (DAAs) has changed hepatitis C virus (HCV) infection treatment. These treatments result in significantly high sustained viral response (SVR) rates (85%-100%) after a short treatment course (12-24 weeks) without any severe adverse effects **(Zuccaro et al., 2020)**.

The available data on role of treatment of chronic HCV infection by new DAAs and improvement of carotid atherosclerosis are scarce and contradicting as study of Petta et al. revealed that HCV eradication by DAA improves carotid atherosclerosis in patients with severe fibrosis with or without additional metabolic risk factors **(Petta et al., 2018)**.