الأهمية الإكلينيكية لإنزيم محول الأنجيوتنسين كدلالة على التليف الكبدي في مرضى متلازمة الباد كياري

رسالة

توطئة للحصول على درجة الماجستير

في الباثولوجيا الإكلينيكية والكيميائية

مقدمة من

الطبيبة / ريهام عماد عبدالعزيز

بكالوريوس الطب والجراحة العامة – كلية الطب – جامعة طنطا

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جامعة عين شمس

2014

Clinical Utility of Angiotensin Converting Enzyme as a Marker of Liver Fibrosis in Budd Chiari syndrome

Thesis

Submitted for partial Fulfillment of Master Degree

in Clinical and Chemical Pathology

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2014

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List of abbreviations

Ab	Antibody
ACE	Angiotensin converting enzyme
ACE1	Angiotensin converting enzyme type 1
ACE2	Angiotensin converting enzyme type2
ACEi	Angiotensin converting enzyme inhibitors
ADH	Anti-diuretic hormone
AFP	Alpha fetoprotein
Ag	Antigen
AGT	Angiotensinogen
AH	Alcoholic hepatitis
AIH	Autoimmune hepatitis
ALD	Alcoholic liver disease
ALP	Alkaline phosphatase
ALT	Alanine transaminase
AMM	Agnogenic myeloid metaplasia
ANA	Antinuclear-antibodies
ANP	Atrial natriuretic peptide
APA	Antiphospholipid antibodies
APCR	Activated-protein-C-resistance
APRI	The AST to Platelet Ratio Index
APS	Antiphospholipid syndrome
ARBs	Angiotensin receptor blockers
AST	Aspartate transaminase
AT	Antithrombin III deficiency
AT1	Angiotensin type 1
AT1R	Angiotensin II type 1 receptor
AT2R	Angiotensin II type 2 receptor

AUC	Area under curve
BCP	Basal core promoter
BCS	Budd–Chiari syndrome
BP	Blood pressure
CBC	Complete blood count
CF	Cystic-Fibrosis
CFLD	Cystic Fibrosis liver disease
CFTR	Cystic Fibrosis conductance Transmembrane
CL	Chemiluminescence immunoassay
CLD	Chronic-liver-diseases
CML	Chronic myelogenous leukemia
COPD	Chronic obstructive pulmonary diseases
CT	Computerize Tomography
CTGF	Connective tissue growth factor
DAB	diamino-benzidine
ECM	Extracelluler matrix
EIAs	Enzyme-immunoassays
ELF	Enhanced Liver Fibrosis
ELISA	Enzyme-linked immunosorbent assay
ELISPOT	Enzyme-linked-immunosorbent-spot
ET	Essential thrombocythemia
FAB	French American –british
Factor Va	Factor-V-activated
FC	Flow Cytometry
FVLM	Factor-V-Leiden-mutation
gACE	Germinal ACE
GD	Graves' disease
GFR	Glomerular filtration rate

GGT	Gamma-glutamyltransferase
GSD	Glycogen storage diseases
HBV	Hepatitis B virus
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HDV	Hepatitis D virus
HE	Hepatic encephalopathy
HH	Hyperhomocysteinemia
HHL	HippurylHistidylLeucine
HPLC	High-performance liquid chromatography
HSC	Hepatic stellate cells
I/D	insertion/deletion
IHC	Immunohistochimistry
IL	Interlukin
INF-β	beta-interferon
INR	international normalization ratio
IP	Immune precipitation
IVC	Inferior vena cava
JNK	Jun N-terminal kinase
KB	Kilobase
LDH	Lactate dehydrogenase
MF	Myelofibrosis
MMPs	Metalloproteinases
MOVC	Membranous obstruction of inferior vena cavc
MPDs	Myeloprolifrative disorders
MRI	Magnetic resonance imaging
MS	Multiple sclerosis
MTHFR	Methyl –tetra-hydro-folate-reductase

NAFLDs	Non-alcoholic fatty liver diseases
NASH	Non-alcoholic steatohepatitis
PBC	Primary biliary cirrhosis
PC	Protein C
PG	Prostaglandin
PM	Prothrombin mutation
PS	Protein S
PT	Prothrombin time
PV	Polythcythemiavera
PVT	Portal vein thrombosis
RA	Rheumatoid arthritis
RAAS	Renin angiotensin aldosterone system
RAS	Renin angiotensin system
ROC	Receiver Operating Characteristic
ROS	Reactive oxygen species
sACE	Somatic ACE
SDS	Sodium dodecyl sulfate
SGPT	Serum glutamic pyruvate transaminase
TGF-β1	Transforming growth factor-β1
TIPS	Transjugular intrahepatic portosystemic shunt
TMB	Tetramethylbenzidine
TMB	Tetramethylbenzidine
TNF-α	Tumor necrosis factor alfa
TP	Total protien
WB	Western blot
WBC	White blood cells
WD	Wilson disease

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Acknowledgement

First and foremost thanks to Almighty**GOD,**the most merciful and kind for helping throughout this work to be completed in this form.

I would like to express my deepest gratitude and appreciation to**Prof. Dr. Mona FathyYoussef,**Professor of Clinical and Chemical Pathology, Faculty of Medicine, Ain Shams University**,** who supervised this study and provided me the finest details and rules to write this fruitful thesis. Also she taught me how to listen and respect the small points before the big ones. It's a great honor to work under her guidance and supervision.

My deep gratitude goes to**Prof. Dr. Mohamad Amin Sakr,**Prof. of Tropical Medicine, Faculty of Medicine, Ain Shams University, for his effort and updated knowledge. He taught me how to gather scientific data from different books and updated papers.

My deep thanks to**Dr. MervatShafikYousef,**Prof. of Clinical and Chemical Pathology, Faculty of Medicine, Ain Shams University, for her kind assistance and because she allowed me.

Special words for my lovely **Family**for their tenderness, love, care and encouragement whom without, I could not probably finished this thesis.

RihamEmad

بسماللهالرحمنالرحيم

"قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا
إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ"

صدقاللهالعظيم

سورة البقرة الآية (32)

INTRODUCTION

Budd–Chiari syndrome (BCS) is characterised by obstruction of the hepatic venous outflow at any level from the small hepatic veins to the right atrium. It leads to post-sinusoidal portal hypertension and congestion of the liver with caudate-lobe hypertrophy. Ascites occurs because of post-sinusoidal portal hypertension as opposed to sinusoidal or presinusoidal portal hypertension, which frequently complicates most forms of cirrhosis **(Hernandez et al., 2006)**.

In patients with BCS, the haemodynamic profile differed significantly from that in cirrhotic patients; BCS patients demonstrated normal cardiopulmonary haemo-dynamics with an expanded plasma volume, with no evidence of systemic vasodilatation **(Joshi et al., 2011).**

Congestion, liver cell loss and fibrosis in centrilobular area are considered characteristic features for BCS **(Ludwiy et al., 1990).**

Evidences suggest that the rennin-angiotensin system (RAS), acts as a mediator of inflammation and fibrosis in chronic liver disease. RAS mediates its fibrogenic effects through the activation of hepatic stellate cells (HSC) with their proinflammatory and profibrotic potential **(Barham et al., 2010).**

The rennin-angiotensin-aldosterone (RAS) axis is a system which involves many essential regulations in the human body for blood pressure; fluid and electrolyte balance **(Beyazit et al., 2010)**. In recent

years, the importance of the RAS system in pathogenesis of a number of diseases has been increasingly reported. Moreover, angiotensin-converting enzyme (ACE), a vital part of the RAS system, is cogitated as a governing molecule in systemic and portal circulation in some disorders (hepatitis B, chronic kidney disease, essential hypertension and stable ischemic heart disease) **(Beyazit et al., 2011 and purnak et al., 2012)**