Spleen Stiffness as Non Invasive Tool in Prediction of Portal Hypertension and Gastro-Esophageal Varices in Adult Cirrhotic Patients

Thesis

Submitted for Partial fulfillment of M.D degree
in Internal Medicine

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2016


وأنزل الله عليك
الكتاب والحكمة
وعلَّمَكَ مَا لَمْ تَكُن
تَعْلَمُ وكَانَ فَضْلُ
اللَّهِ عَلَيْكَ عَظِيماً
صدق الله العظيم

I would like to begin by thanking ALLAH for his guidance and protection, may this blessing always guideus.

Moreover I would like to express my sincere and profound gratitude to ***Prof. Dr.KhaledZakaria Al Karmoty*** Professorof Internal Medicine, Hepatology and Gastroenterology Faculty of Medicine – Ain Shams University for hismeticulous supervision, royal encouragement, and valuable advices throughoutthe work.

I wish to express deep appreciation to ***Assist. Prof. Dr.SherifSadekShabana***Assistant Professor of Internal Medicine, Hepatology and Gastroenterology Faculty of Medicine – Ain Shams University for his continuous guidance, unique supervision and kind care.

I am also grateful to ***Assist. Prof. Dr.Zainab Ahmed Ali El-Din*** Assistant Professor of Internal Medicine, Hepatology and Gastroenterology Faculty of Medicine – Ain Shams University for her kind effort, assistance she offered me throughout the performance of this work.

Also I would like to extend my warmest gratitude to ***Dr. Ahmed Samir Abo Halima*** Lecturer of Internal Medicine, Hepatology and Gastroenterology Faculty of Medicine – Ain Shams University for his hard and faithful effort that helped me to do this work.

I would also like to thank ***Dr. Ahmed Mahmoud Abd- El Aleem***Lecturer of Internal Medicine, Hepatology and Gastroenterology Faculty of Medicine – Ain Shams Universityfor his constant support.

Mohamed Hussein galal

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List of Abbreviations

AASLD ..... :American Association for the Study of Liver Diseases.
AFP ..... : Alpha feto protein
ALT..... : Alanine aminotransferase
AST ..... : Aspartate aminotransferase
AUC ..... : Area under the curve
BMI..... : Body mass index
CO..... : Carbon monoxide
COX..... : cyclo-oxygenase
CSPH..... :clinically significantly portal hypertension
CT ..... :computed tomography
CVC ..... : Caudal Vena Cava
DA ..... diagnostic accuracy
ET..... : Endothelins
EVL..... : Esophageal variceal ligation
FHVP..... : Free hepatic vein pressure
FT..... :fibrotest
GI..... : Gastrointestinal
GOV..... : Gastro-Oesophageal Varices
HCC..... : Hepatocellular carcinoma
HE ..... :Hepatic encephalopathy
HSC..... : Hepatic Stellate Cell
HVPG ..... : Hepatic venous pressure gradient
IGV..... : Isolated Gastric Varices
IHVR ..... : Intrahepatic venous resistance
INR..... : International normalized ratio
IVC..... : Inferior vena cava
kPa ..... : K Pascal
LS ..... : Liver stiffness

List of Abbreviations (Cont...)

MAPSS ..... :Multiple acquired porto-systemic shunts.

MELD: ..... : Model for end-stage liver disease

MRI ..... Magnetic Resonance Imaging

NO ..... : Nitric oxide

NPV ..... : Negative predictive value

NSBB ..... : Non selective beta blocker

OV ..... : Oesophogeal varices

PBF ..... : Portal blood flow

PH ..... : Portal hypertension

PHG ..... : Portal hypertensive gastropathy

PPG ..... : Portal pressure gradient

PPV ..... : positive predictive value

PV ..... : Portal vein

PVP ..... : Portal vein pressure

SAAG ..... : Serum ascites albumin gradient

SS ..... : Spleen stiffness

TE ..... : Transient elastography

TIPS ..... : Transjugular intrahepatic portosystemic shunt

US ..... : Ultrasound

WHVP ..... : Wedged hepatic vein pressure

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INTRODUCTION

Portal hypertension (PH) is one of the most important complications of liver cirrhosis. Portal hypertension is defined as increase in the pressure of portal vein and its territory due to increase the resistance, increase blood flow, or both in the portal circulation. The clinical consequences of PH, which include the development of multiple acquired splenomegaly, porto-systemic shunts, esophageal varices, ascites, hepatic encephalopathy, or some combination of these and cause death in patients with liver cirrhosis ***(Buob et al., 2011).***

Splenomegaly is a common finding in portal hypertension that should determine changes in the spleen's density because of portal and splenic congestion and/or because of tissue hyperplasia and fibrosis ***(Stefanescu et al., 2011).***

Noninvasive methods can be used to evaluate the presence and degree of portal hypertension in patients with cirrhosis, and the diagnostic performance is rather fair. Methods evaluating increased hepatic vascular resistance mainly include the detection of hepatic fibrosis by serum markers and transient elastography. The radiological assessment of hyperkinetic syndrome and measurement portal and splenic veins diameteris are performed by ultrasound. The assessment of severe portal hypertension by the presence of varices may be performed with

simple tools such as biological assays, CT scanning, and esophageal capsules ***(Thabutet al., 2010).***

Transient elastography (fibroscan) is validated for the diagnosis of significant fibrosis and cirrhosis in chronic hepatitis, in recurrence of hepatitis after liver transplantation, in chronic cholestatic diseases, in alcoholic disease and in nonalcoholic fatty liver disease. Fibroscan is an excellent tool for the early detection of cirrhosis and for the evaluation of portal hypertension ***(Victor and Julien, 2010).***

Spleen elasticity should be closely related to portal venous pressure because histologic changes in the spleen would be directly caused by portal hypertension. These changes might be quantified by elastography, so spleen stiffness can be assessed using transient elastography as its value increasing in the liver disease progresses and portal hypertension ***(Colecchia et al., 2012).***

AIM OF THE STUDY

The aim of this study is to assess the ability of spleen stiffness measured by transient elastography (fibroscan) in prediction of portal hypertension and gastro-esophageal varices inadult cirrhotic patients.

Chapter 1

PORTAL HYPERTENSION

Definition:

Portal hypertension is a frequent syndrome – most often caused by chronic liver diseases – which is characterized by an increased portal pressure gradient (PPG; the difference in pressure between the portal vein and the inferior vena cava which represents the perfusion pressure of the liver with portal blood). The increased portal pressure leads to other consequences, such as splenomegaly, growth of an extensive network of portal-systemic collaterals that shunt portal blood flow to the systemic circulation bypassing the liver and development of a hyperkinetic circulatory state. In normal conditions the PPG ranges between 1 and 5 mmHg. Portal hypertension becomes clinically significant (associated with risk of clinical complications) when the PPG increases to 10 mmHg or above. Values between 5 and 9 mmHg represent subclinical portal hypertension ***(Berzigottiet al., 2013).***

The portal venous system:

I) Anatomy of the Portal Venous System:

The portal system includes all veins that carry blood from the abdominal part of the alimentary tract, the spleen, pancreas

and gallbladder. The portal vein enters the liver at the porta-hepatis in two main branches, one to each lobe; it is without valves in its larger channels. The portal vein is formed by the union of the superior mesenteric vein and the splenic vein just posterior to the head of the pancreas at about the level of the second lumbar vertebra; it courses superiorly and toward the right passing behind the first part of the duodenum and anterior to the inferior vena cava (Fig.1). It extends slightly to the right of the midline for a distance of 5.5 – 8 cm to the porta hepatis ***(Mathur, 2008).***

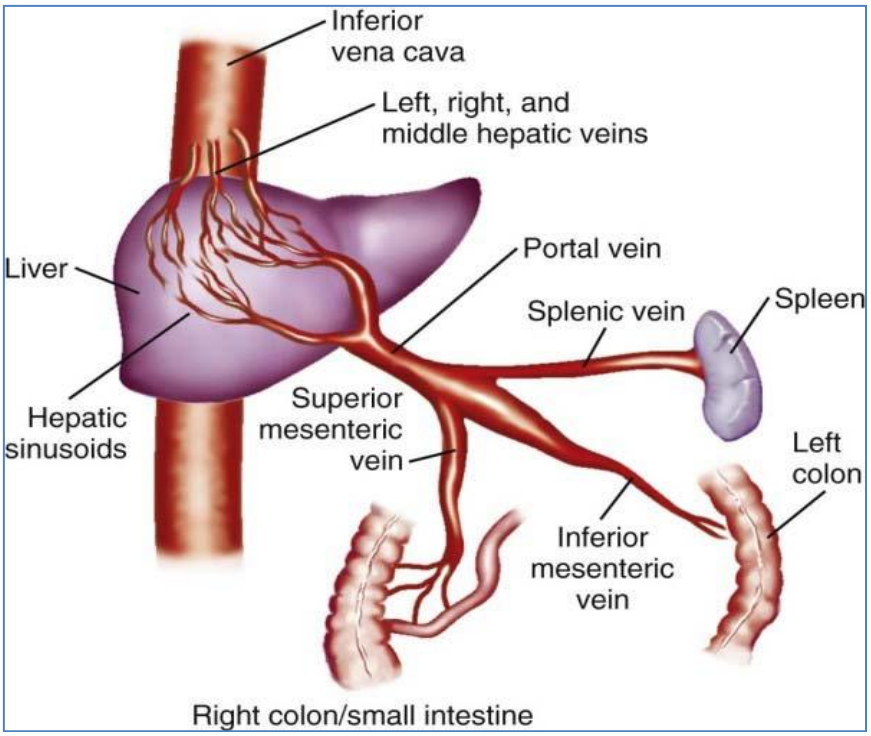

Fig.(1): Anatomy of the portal circulation. Blood vessels that constitute the portal circulation and hepatic outflow tracts are depicted **(Sleisenger and Fordtran, 2010**).