Assessment of Non-invasive Predictors of Gastric Varices in patients with liver cirrhosis

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بسم الله الرحمن الرحيم

قالوا سبحانك لاعلم لنا إلا ماعلمتنا إنك أنت العليم الحكيم

صدق الله العظيم

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ABSTRACT

Background: Identification of non-invasive predictors of varices will enable us to carry out upper gastrointestinal (GI) endoscope in selected group of patients thus avoiding unnecessary intervention and at the same time not missing the patients at risk of bleeding.

AIM: Assessment of non-invasive predictors of Gastric varices in patients with liver cirrhosis with no history of previous endoscopic or surgical intervention for portal hypertension.

METHODS: The study included 90 cirrhotic patients divided into three groups: patients with no varices, patients with esophageal varices and patients with gastric varices with or without esophageal varices. They all underwent a complete biochemical workup, upper gastrointestinal endoscopy and Doppler ultrasound examination.

RESULTS: Upon doing multiple regression analysis on these predictors: Child's classification *(child's C)*, Splenic bi-polar diameter *(≥ 15 cm)*, presence of ascites, presence of hepatocellular carcinoma (HCC), Portal Vein (PV) Diameter *(≥ 15 mm)*, abnormal PV Blood Flow Direction, PV Blood Flow Velocity *(< 10 cm/sec)*, PV Congestion Index *(≥ 0.15 cm/sec)*, Splenic Vein (SV) Diameter *(≥ 11mm)*, abnormal SV Blood Flow

Direction, SV Blood Flow Velocity *(< 14 cm/sec)*, SV Congestion Index *(≥ 0.08 cm/sec)*, Left Gastric Vein (LGV) detection, LGV Diameter *(≥ 8 mm)*, abnormal LGV Blood Flow Direction, LGV Blood Flow Velocity *(≥ 13 cm/sec)* and detection of gastrorenal shunts (GRS). this model was found to be responsible for 82.5% of the incidence of gastric varices and this is extremely significant ($P<0.001$).

CONCLUSION: This model of non invasive predictors can significantly predict incidence of gastric varices.

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AASLD	:	American Association for the Study of Liver Disease
ALT	:	Alanine Aminotransferase
ANOVA	:	Analysis of Variance
ANP	:	Atrial Natriuretic Peptide
AST	:	Aspartate Aminotranserase
AT-II	:	Angiotensin-II
CI	:	Congestion index
CSPH	:	clinically significant portal hypertension
CT	:	Computed tomography
EGD	:	esophgeo-gastro-duodenoscopy
eNOS	:	endothelial cell nitric oxide synthetase
ET-1	:	endothelin 1
EUS	:	Endoscopic ultrasonography
EV	:	Esophageal varices
EVL	:	Endoscopic variceal ligation
EVO	:	Endoscopic variceal obturation
EVS	:	Endoscopic variceal sclerotherapy
GAVE	:	Gastric antral venous ectasia
GI	:	Gastro-intestinal
GOV	:	Gastroesophageal varices
GRS	:	Gastrorenal shunts
GV	:	Gastric varices
HB	:	Hemoglobin level
HBV	:	Hepatitis B virus
HCC	:	Hepatocellular carcinoma
HCV	:	Hepatitis C virus
HFL	:	Hepatic focal lesion
HSC	:	hepatic stellate cells
HVPG	:	Hepatic venous pressure gradient

IGV	:	Isolated gastric varices
IHVR	:	intrahepatic vascular resistance
iNOS	:	inducible form of nitric oxide synthetase
INR	:	International Normalization Ratio
IVC	:	inferior vena cava
LGV	:	Left gastric vein
MCP-1	:	monocyte chemotactic protein 1
MELD	:	Model for End-stage Liver Disease
MMP-2	:	metalloproteinase 2
MRI	:	Magnetic Resonance Imaging
nNOS	:	neuronal cells express constitutive nitric oxide synthetase forms
NO	:	Nitric oxide
NOS	:	nitric oxide synthetase
NYHA	:	New York Heart Association
OR	:	Odds ratio
PC	:	Prothrombin concentration
PDGF	:	platelet-derived growth factor
PG	:	prostaglandins
PHG	:	Portal hypertensive gastropathy
PHT	:	Portal hypertension
PIGF	:	placental growth factor
Plt.	:	Platelet
PP	:	portal pressure
PPG	:	portal pressure gradient
PT	:	Prothrombin time
PV	:	Portal vein
PVCI	:	Portal vein congestion index
PVT	:	Portal vein thrombosis
PVV	:	Portal Vein Flow Velocity
RAAS	:	Renin Angiotensin activating system

RCTs	:	randomized controlled trials
SV	:	Splenic vein
SVCI	:	Splenic vein congestion index
SVV	:	Splenic Vein Flow Velocity
TGF-B	:	transforming growth factor B
TIPS	:	transjugular intrahepatic porto-systemic shunting
UII	:	urotensin II
WHVP	:	wedged hepatic vein pressure

INTRODUCTION

Liver cirrhosis is a major health problem in Egypt, especially complicating viral hepatitis ***(El-Zayadi et al., 2005)***. Portal hypertension commonly accompanies the presence of liver cirrhosis. The development of esophageal varices (EV), gastric varices (GV) and portal hypertensive gastropathy (PHG) are the major complications of portal hypertension (***De Franchis & Primignani, 2001).***

Gastric varices (GV) are less prevalent than esophageal varices (EV), occurring in approximately 20% of patients with portal hypertension (PHT) with a reported incidence of bleeding of about 25% in 2 years, with a higher bleeding incidence for fundal varices ***(Sarin et al., 1992).***

Gastric varices are developed due to spontaneous portosystemic collaterals (left gastric, splenorenal and gastrorenal shunts) commonly developed between the splenic vein and gastric varices ***(Watanabe et al., 1988).*** Thus GV is commonly classified based on their relationship with esophageal varices as well as their location in the stomach ***(Sarin et al., 2001).***

In 1996 the American Association for the Study of Liver Disease (***AASLD***) single topic symposium stated that cirrhotic patients should be screened for the presence of varices when portal hypertension is diagnosed ***(Grace et al., 1998).***

In Patients with compensated cirrhosis and no varices on the initial esophgeo-gastro-duodenoscopy (EGD), it should be repeated in 3 Y, if there is hepatic decompensation, EGD done at that time & repeated annually, Patients with small varices that have not bled and who are not receiving beta-blockers, EGD should be repeated in 2 years. If there is evidence of hepatic decompensation, EGD should be done at that time and repeated annually. In patients with small varices who receive beta-blockers, a follow-up EGD is not necessary ***(Guadalupe et al., 2007).***

However, this approach has two major limitations. Endoscopy is an invasive procedure and also the cost effectiveness of this approach is also questionable ***(Brennan et al., 2003)***, as only 9-36% of patients with cirrhosis are found to have varices on screening endoscopy. It may be more cost-effective to routinely screen patients at high risk for the presence of varices so as to reduce the increasing burden and procedure cost of endoscopy units ***(Zoli et al., 1996).***