Assessment of hepatopulmonary syndrome in cirrhotic patients according to Child –Pugh classification.

Thesis

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Presented by

Mohamed Sayed Hassan

Under supervision of

Dr. Rokaya Abd El Aziz Mohamed

Professor of internal medicine

Faculty of medicine

Cairo university

Dr. Tarek Saad El Din Heshmat

Assistant professor of internal medicine

Faculty of medicine

Cairo university

Dr. Abir Zakaria Mohamed

Assistant professor of internal medicine

Faculty of medicine

Cairo university

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Abstract

Assessment of hepatopulmonary syndrome in cirrhotic patients according to Child –Pugh classification.

Background:- Hepatopulmonary syndrome (HPS) is one of the pulmonary complications of liver cirrhosis which affect the disease treatment and prognosis and is a factor for arterial blood oxygen reduction . This syndrome is characterized by a triad of presence of liver cirrhosis and arterial blood oxygen reduction found in arterial blood gases test and intrapulmonary vascular dilatation confirmed by contrast enhanced echocardiography.

Objectives:- to illustrate the manifestations and how to diagnose the hepatopulmonary syndrome in cirrhotic patient according to Child-Pugh classification .

Methods: -Suitable numbers of cirrhotic patients undergo the followings:-

1- History and full physical examination as well as clinical features related to hepatopulmonary syndrome including dyspnea, clubbing, cyanosis, spider and collateral veins .

2- Liver function tests (alanine aminotransferase(ALT), aspartate aminotransferase(AST),alkaline phosphatase, albumin,total bilirubin, direct bilirubin and prothrombin concentration).

3- Hepatitis markers :-HBsAg, HBsAb, HBcore Ab,HCV Ab

4- Arterial blood gases in recumbent position and after standing for 20 min to detect orthodeoxia.

5- Contrast enhanced echocardiography.

Results:- Positive cases for HPS were detected in 6/60 (10%) all of them are child C. Dyspnea has the maximum sensitivity(100%) in HPS cases followed by cyanosis(83.33 %) , spider(83.33 %)

and p.erythem(83.33 %). Platypnea (100 %) & clubbing (94.4 %) were the most specific clinical features . All patients with HPS are child C with albumin level below 3 and PC less than 50% suggesting that HPS development is related to liver synsthetic dysfunction. PO_2 was less than 70 mmHg in (100%) of cases and

was less than 60 mmHg in (50%) .Orthodeoxia was present in (66.66 % of HPS and 0 %of non HPS patients)with 66.66 % sensitivity and 100% specificity.

Conclusion:- Hepatopulmonary syndrome (HPS) is one of the pulmonary complications of liver cirrhosis .The severity of HPS is clearly correlated with the degree of liver disease. Dyspnea has the maximum sensitivity followed by cyanosis , spiders and palmer erythema. Platypnea & clubbing were the most specific clinical features. Orthodeoxia strongly suggest the diagnosis of HPS with 100% specificity

Further studies are needed to confirm our results.

Key words:- Liver cirrhosis , hypoxemia, hepatopulmonary syndrome.

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Abbreviations

A-a0_2 gradient	Alveolo-arterial oxygen gradient
AAT	Alpha 1-antitrypsin deficiency
ALD	Alcoholic liver disease
ALKMA	Anti-liver kidney microsomal antibody
ALP	Alkaline phosphatase
ALT	Alanine transaminase
AMA	Anti-mitochondrial antibody
ANA	Anti-nuclear antibody
ASMA	Anti-smooth muscle antibody
AST	Aspartate transaminase
ATG	Antithymocyte globulin
B-DNA	Branched DNA
CBDL	Common bile duct ligation
CF	Cystic fibrosis
cGMP	Cyclic guanosine monophosphate
CO	Carbon monoxide
CTP classification	Child-Turcotte-Pugh classification
DLCO	Diffusion lung capacity for carbon monoxide
ECM	Extracellular matrix

ENOS	Endothelial NO synthase
ET-1	Endothelin-1
ETB	Endothelin B
GGT	Gamma Glutamic Transpeptidase
HAI	Histologic activity index
HCV	Hepatitis C virus
HIV	Human immune deficiency virus
HO	Heme oxygenase
HPS	Hepatopulmonary syndrome
HRCT	High-resolution computerized tomography
HRS	Hepatorenal syndrome
HSC	Hepatic stellate cells
IBD	Inflammatory bowel disease
INOS	Inducible NO synthase
IPVD	Intrapulmonary vascular dilatations
LFTs	Liver function tests
MARS	Molecular adsorbents recirculation system
MCP-1	Monocyte chemotactic protein-1
MELD	Model for end -stage liver disease
NAFLD	Nonalcoholic fatty liver disease
NO	Nitric oxide
PaO_2	Arterial oxygen tension
PCO_2	Carbon dioxide tension
PCR	Polymerase chain reaction

PDGF	Platelet-derived growth factor
PMNL	Polymorphonuclear leukocyte
PSC	Primary sclerosing cholangitis
PT	Prothrombin time
RA	Retinoic acid
RAAS	Renin-angiotensin-aldosterone system
ROI	Reactive oxygen intermediates
RTKs	Receptor tyrosine kinases
SAAG	Serum-ascites albumin gradient
SBP	Spontaneous Bacterial Peritonitis
SVR	Sustained virological response
Tc-99m MAA	99m technetium macroaggregated albumin
TGF-β_1	Transforming growth factor-β_1
TIMP 1 , 2	Tissue inhibitor of metalloproteinase 1 and 2
TIPS	Transjugular intrahepatic portosystemic shunt
TMA	Transcription mediated amplification

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Table (3-11) show comparison between group I and group III as regard (Mean±SD) of SO_2%(percentage of O_2 saturation),PO_2 (arterial O_2 tension)(supine and standing) and PCO_2(arterial CO_2 tension).

Table (3-12) show comparison between group II and group III as regard (Mean±SD) of SO_2%(percentage of O_2 saturation),PO_2 (arterial O_2 tension)(supine and standing) and PCO_2(arterial CO_2 tension).

Table (3-13) show PO_2 Supine and Standing in HPS, non HPS patients and its P value.

Table (3-14) represents the distribution of PO_2 in the three different groups.

Table (3-15) show distribution of PO_2 values within HPS and non HPS cases.

Table (3-16) show echo findings in HPS and non HPS cases.

Introduction

Cirrhosis is the final common pathway for a variety of liver diseases and occurs when excessive fibrosis results in the conversion of normal liver architecture into structurally abnormal nodules . It may be caused by a variety of factors e.g viral hepatitis(B or C), alcohol, hemochromatosis and primary biliary cirrhosis. **(Sammy, et al 2002)**

Egypt has the highest countrywide prevalence of hepatitis C virus in the world **(Frank, et al 2002)** . Majority of cases develop chronic hepatitis that is usually asymptomatic for years. Twenty percent of those with HCV caused chronic hepatitis progress to cirrhosis and a proportion of these die as a result of complication of liver cirrhosis **.** **(Alter, et al 1992)**

Hypoxemia in patient with liver cirrhosis is common and is related to lung parenchymal abnormalities including interstitial infiltrate, impaired gaseous diffusion and an obstructive airway component. It may be also due to pleural effusion caused by hypoalbuminemia in cirrhotic patient. **(Zhang, et al 2003)**

Hepatopulmonary syndrome (HPS) is one of the pulmonary complications of liver cirrhosis which affect the disease treatment and prognosis and is a factor for arterial blood oxygen reduction . This syndrome is characterized by a triad of presence of liver cirrhosis and arterial blood oxygen reduction found in arterial blood gases test and intrapulmonary vascular dilatation confirmed by contrast enhanced echocardiography **.** **(Anand, et al 2001)**

Hypoxia in HPS is due to intrapulmonary shunting through direct arteriovenous communications. **(McAdom, et al 1996)** As the vascular abnormalities predominate in the middle to lower lung field ,gravitational effect may increase the blood flow to worsen the ventilation-perfusion mismatch and finally result in a deterioration in arterial oxygenation when the upright position is attained (orthodeoxia), hense worsening of dyspnea in upright position (platypnea). **(Gomex, et al 2004)**

Due to widespread liver transplantation as a treatment of liver cirrhosis , studying the nature , pathogenesis , clinical features and diagnosis of hepatopulmonary syndrome is very important. it was found that HPS is an independent predictor of survival and mortality management, Therefore it should be diagnosed before considering liver transplantation. **(Schenkp, et al 2003)**