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Jimma University, Collage of Public Health and Medical Science,
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PROJECT MEMBERS

Dr Gemechu Geleto (MD, Resident)..... Principal investigator

Dr Wondim Getnet (MD, Radiologist).....Co investigator₁

Ato Tsegaye Tewelde (MPHE, BSC)..... Co investigator₂

Mr. Mesfin Zewdu (MSc, Medical Physics)Investigator

Dr. Gemechis Asefa (MD, Resident).....Investigator

RESEARCH TOPIC: Ultrasound Assessment of Normal Portal Vein Diameter in Jimma University Specialized Hospital

MARC, 2015

Jimma, Ethiopia

**ULTRASOUND ASSESMENT OF NORMAL PORTAL VEIN
DIAMETER IN JIMMA UNIVERSITY SPECIALIZED
HOSPITAL**

BY DR GEMECHU GELETO

RADIOLOGY RESIDENT

**A RESEARCH PAPER FOR A THESIS TO BE SUBMITTED TO
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JIMMA, ETHIOPIA

Jimma University, Department of Radiology
A Research Paper On
Ultrasound Assessment of Normal Portal Vein Diameter in Jimma
University Specialized Hospital

By Dr Gemechu Geleto
Radiology Resident

Advisor

1- Dr.Wondim Getinet (MD, Radiologist)

2- Ato Tsegaye Tewelde (MPHE, BSC)

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Jimma, Ethiopia

Research Summary

Background: Portal hypertension occurs when the portal venous pressure exceeds 15mm Hg.. Liver cirrhosis, whatever the primary cause, is the commonest cause of portal hypertension. Because of its accessibility, lack of ionizing radiation and rapid assessment, sonography plays a major role in the assessment of portal hypertension. Even if the additional use of color and spectral Doppler improves the assessment of patients suspected of having portal hypertension, gray scale assessment of portal vein diameter is corner stone in the initial evaluation. Therefore knowing the normal portal venous dimension in a study population of interest is so crucial.

Objective:

The main objective of the study is ultrasound assessment of normal portal vein diameter in Ethiopians patients visiting Jimma University Specialized Hospital.

Methods:

A prospective cross-sectional study was done at Jimma University Specialized Hospital to sonographically assess the normal portal vein diameter pattern. Data were collected from patients visiting radiology department on consecutive bases from Dec- Jan, 2014 and analyzed using spss version 16

Result:

A total of 195 patients were included on the study, 75(38.5%) were females while 120(61.5%) were males. Mean PVD in quiet respiration and in the extremes of respiration was almost the same, 10.3 +1.8mm and 10.66+1.8mm respectively. The mean of portal vein diameter in Male were 11.10 +1.7mm and of Females were 10.1 + 1.5 mm ,and there p-value =0.096. Nineteen (10%) of participants had mean portal vein diameter of greater than 13mm (above normal) while 176(90%) had less than 13mm (normal range). There is significant variation of PVD with age but not with sex. The Pearson correlation between them was correlated at 0.001.

Conclusion:

The mean portal vein diameter of the majority of the participants was comparable with many other study results and can be used as a base line for further related studies and workup of the causes of abnormally high portal vein diameter noted in this study. II

Key word: Portal vein diameter, Quite, Deep inspiratory and Deep expiratory

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ACRONYMS AND ABBREVIATIONS

CF CYSTIC FIBROSIS

CLD CHRONIC LIVER DISEASE

HTN HYPERTENSION

JUSH JIMMA UNIVERSITY SPECIALIZED HOSPITAL.

MHZ MEGA HERTZ

mmHg MILLIMETER OF MERCURY

MRN MEDICAL REGISTRATION NUMBER

NCPHT NONCIRRHOTIC PORTAL HYPERTENSION

PHT PORTAL HYPERTENSION

PPF PERIportal FIBROSIS

PSCT PORTOSYSTEMIC COLLATERAL SHUNT

PV PORTAL VEIN

PVD PORTAL VEIN DIAMETER

PVfV PORTAL VEIN FLOW VOLUME

RUQ RIGHT UPPER QUADRANT

SPSS STATISTICAL PACKAGE FOR SOCIAL SCIENCES

USG ULTRASONOGRAPHY

Chapter One: INTRODUCTION

1.1 Background

Portal hypertension is defined as an increase in portal venous pressure which results in impendence of blood flow through the vein into the hepatic circulation. It exists when the portal venous pressure is above 15mmHg or the hepatic venous gradient is more than 5 mmHg [3, 11] Portal hypertension is caused most often by cirrhosis (in developed countries), schistosomiasis (in endemic areas), or hepatic vascular abnormalities. [1] Portal hypertension is the most common complication and also one of the important causes of death in chronic liver diseases. [2]

Even if Cirrhosis is the most common cause, portal hypertension can also be present in the absence of cirrhosis in a condition referred to as "noncirrhotic portal hypertension". As a general rule, the clinical consequences of portal hypertension are similar regardless of the cause or site of obstruction. [4]

Portal hypertension leads to dilatation of portal vein, splenomegaly, and formation of portal systemic collaterals at different sites. The portal system and the systemic venous circulation are connected at several locations. . These are vascular channels that are functionally closed in normal conditions but become dilated in portal hypertension as a consequence of increased intravascular pressure and blood flow. As the result of that there is development of portosystemic collateral shunts which diverts blood away from the liver. Gastro-oesophageal varices is one of the consequence of collateral shunts which if responsible for the main complications of portal hypertension that is massive upper GI bleeding. [2, 4]

Ultrasound is important in obtaining information on the condition of the portal venous system in all patients with various medical conditions like chronic liver disease. In such cases it is used to detect diameter increment of portal vein as indicative of portal hypertension. Ultrasound can detect variable degree of periportal thickening along with dilatation of portal vein in schistosomiasis [5] 2

Gray-scale and Doppler US allow anatomic and functional evaluations of the major tributaries of the portal venous system and, when performed by an experienced sonographer, can provide valuable information. [6]

Sonography, in addition of being nonionizing, its accessibility, noninvasiveness, portable nature, reliability, low cost and also its ability of rapid accomplishment makes it a good diagnostic tool which plays a great role in the diagnosis and follow up of patients with PHN. It can also suggest the possible cause too.

Even if duplex sonography assessment of the portal vein has the added advantage of assessing also the flow rate, gray scale measurement of the portal vein diameter is the corner stone and also has a reasonable accuracy in diagnosing patients suspected of having portal hypertension. [4]

Ultrasound is an accurate non-invasive means of assessing its etiology, severity and complications but in order to maximize diagnostic accuracy a systematic and thorough approach is advised involving assessment of the liver, spleen, portal and hepatic circulations. [7]