Original Article

LT-RT PORTAL VIEN RATIO IN SONOGRAPHIC DIAGNOSIS OF ALCOHOLIC LIVER DISEASE

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Summary:

Background: *Alcohol remains the single most significant cause of liver disease throughout the Western world, responsible for between 40 and 80% of cases of cirrhosis in different countries. There are no characteristic sonographic features of ALD. Many of the factors underlying the development of alcoholic liver injury remain unknown, and significant questions remain about the value of even very basic therapeutic strategies.*

Patients and Methods: *A total number of 50 patients with ALD were studied. Abdominal Doppler ultrasanography to determine the ratio of the left to right portal vein (PV) was done. They were compared with 50 healthy persons (control) and 50 patients with comparable CLD due to other causes.*

Results: *The diameter of the LT PV was 10.78 ± 3.37, 7.92 ± 1.56, 9.9 ± 2.37 mm in study group, healthy control and CLD (not alcoholic) respectively. The diameter of the RT PV was 9.13 ± 1.96, 9.05 ± 1.59, 9.7 ± 3.37 mm in study group, healthy control and CLD (not alcoholic) respectively. The largest diameter of the LT PV was 19.2 mm and RT PV was 19.3mm. The smallest diameter of the LT PV was 4.8 mm and RT PV was 4.7 mm. There was significant correlation between LT-TR PV ratio of one or more and ALD.*

In conclusion: *The LT-RT PV ratio equal to or more than one was valid in sonographgic finding in the diagnosis of ALD*

Key wards: *Alcoholic liver disease, LT-RT Portal vein ratio.*

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Introduction

The association of alcohol with cirrhosis was recognized by Matthew Baillie in 1793. The incidence of cirrhosis among alcoholics is about 10-15 % [1]. The liver injury requires 80 gm of ethanol daily for 10-20yrs [2]. There are currently four major theories concerning the mechanism by which alcohol damages the liver: (1) Centrilobular hypoxia [3]. (2) Neutrophil infiltration and activation (4). (3) Inflammatory cell infiltration and activation. (5) (4) Antigenic adduct formation. (6). The laboratory parameters that are most useful in predicting the severity of alcoholic liver injury are bilirubin level, prothrombin time (PT), and albumin level. The portal vein originates at the junction of the superior mesenteric and splenic veins. US can show a dilated portal vein and collaterals in portal hypertension. (7) Doppler US depend on the principle that the velocity and direction of flow in a vessel can be derived from the difference between the frequency of US signal emitted from the Transducer and that reflect back (echo) from the vessel. In portal hypertension the direction of portal flow and the patency of porto-systemic shunt can be seen.

Patients & methods:

A total number of 50 patients with ALD attending the Gastroenterology and Hepatology teaching hospital were studied. All consumed no less than 80 GMs of ethanol or its equivalent for 10-20 years, with evidence of liver disease, and in the absence of other significant etiology. Each patient was interviewed, taking a history, a general medical examination was done and a study protocol paper was filled. Abdominal Doppler ultrasanography to determine the ratio of the left to right portal vein (PV) was done, the same performed on with 50 healthy control and 50 patients with comparable CLD due to other causes.

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The Aim of the study:

To determine the value of left-to-right PV ratio in the sonographic diagnosis of ALD.

Results:

The LT-RT PV ratio measured in 50 patients with ALD and compared to 50 age matched control and 50 patients with CLD (not alcoholic), The diameter of the LT PV was 10.78 ± 3.37, 7.92 ± 1.56, 9.9 ± 2.37 mm in study group, healthy control and CLD (not 3.37 mm in study group, healthy and CLD control respectively. The largest diameter of between LT-TR PV ratio of one or more and ALD as in 19.3mm. The smallest diameter of the LT PV was 4.8 mm and RT PV 4.7 mm. the LT PV was 19.2 mm and RT PV was

There was a significant correlation alcoholic) respectively. The diameter of the RT PV was 9.13 ± 1.96, 9.05 ± 1.59, 9.7 ± Table (1) P (1) < 0.001. Sensitivity = 84%Specificity = 90%PPV = 89.4%NPV = 84.9%False +ve = 10%False -ve = 16%Accuracy = 87% p (2) <0.025 (sig).

If this test was used as a screening procedure one can detect up to 84% of possible ALD cases. Given a positive test one can be 89.4% confident that ALD is really present. In the same clinical situation given a negative test one can exclude ALD with 84.9% confidence.

Discussion:

The LT-RT PV ratio equal to or more than one was significantly correlated with ALD. There are no characteristic radiological features of ALD; the most common finding is hepatic steatosis, detectable by increased echogenicity on sonography. (7, 8) Trigaux studied 50 patients in whom the LT PV diameter was equal to or greater than the RT PV diameter and compared them to a control group of 50 patients with LT PV is less than RT PV diameter. Clinical and laboratory data indicating chronic ALD were observed with a significantly higher frequency in the study group than in the control group. It emerge from Trigaux and our study that LT PV equal to or more than RT PV represent a useful ultrasonographic sign of ALD, corresponding to a relative enlargement of the left hepatic lobe compared with the right. (9) In conclusion, the LT-RT PV ratio equal to or more than one was valid in sonographgic diagnosis of ALD

LT-RT PV ratio	ALD	Healthy c	P value (1)	CLD	P value (2)
+ve (≥1)	42	5		32	
-ve (<1)	8	45		18	
Total	50	50	<0.001	50	<0.025

Table (1): LT-RT PV ratio ≥ 1 in ALD and control

. References:

1. Pequignot GB, Cyrulink F: Chronic disease due to overconssumption of alcoholic drink. In International Encyclopaedia of Pharmacology and Therapeutics, vol.2. Pergamon Press, Oxford, 1970, pp. 375-412.
2. Lelbach, WK: Cirrhosis in the alcoholic and its relation to the volume of alcohol abuse. Ann N Y Acad Sci 29:1503, 1975.
3. Ji, S, Lemaster, JJ, Chrestenson, V, Thurman, RG: Periportal and pericentrl hypoxia pyridine nucleotide fluorescence from the surface of the perfused liver: Evaluation of the hypothesis that chronic treatment with ethanol produces pericentral hypoxia. Proc Natl Acad Sci U S A 79:5415, 1982.
4. Sheron, N, Bird, G, Koskinas, J, et al: Circulating and tissue level of the neutrophil chemotaxin interleukin-8 are elevated in severe acute alcoholic hepatitis, and tissue levels correlate with neutrophil infiltration. Hepatology 1993; 18:41.
5. Nanji, AA, Miao, L, Thomas, P, et al: Enhanced cyclooxygenase-2 gene expression in alcoholic liver disease in the rat. Gasreoenterology 1997; 112:943.
6. Niemela, O, Parkilla, S, Yla-Herttuala, S, et al: Covalent protein adducts in the liver as a result of ethanol metabolism and lipid peroxidation. Lab Inves 1994; 70:537.
7. Aube, Oberti E, Korali N et al. ultrasonographic diagnosis of hepatic fibrosis or cirrhosis. J. Hepatol 30:472; 1999.
8. Killi RM. Doppler sonography of the native liver. Eur. J. Radiol. 1999; 32:21.
9. Trigaux JP, Melange M, Buysschaert M, et al: Alcoholic liver disease: value of the left-to-right portal vein in its sonographic diagnosis. Gastrointest-radiol 16:215-23, 1991.