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Background and Aims: Between 80 and 90% of totally asymptomatic patients already have an elevated PPG (measured clinically as an increase in the hepatic venous pressure gradient (HVPG) and endoscopy discloses that 40% already have esophageal varices. HPVG is an invasive test (as well as endoscopy) that demonstrates high sensitivity but low specificity for prediction first variceal bleeding. Our primary objective was to search a non-invasive screening procedure in order to substitute invasive methods (HVPG, endoscopy) for patients with chronic liver disease (CLD) and suspicion of portal hypertension (PH).

Method: Splenic artery and splenic vein volume blood flow (SAVBF/SVVBF) were evaluated in patients with clinically significant portal hypertension (CSPH) (n=190) by means of Doppler US in comparison with that in normal controls (control 1 group– healthy volunteers, n=36), and patients with CLD but absence of signs of PH (n=34) –control 2 group. Volume flow was calculated as Vf=Tamx*S (vessel cross sectional area). All measurements were done by single operator according to extended sonography protocol.

Results: Means of SABF/SVBF in patients with CSPH were 1.35/1.11l/min, median 1.22/0.88l/min. There was no significant difference in patients with or without bleeding episode or ascities. In C2 and C1 groups means of SAVBF/SVVBF were 0.47/0.43l/min, median 0.46/0.41l/min and 0.30/0.26l/min, median 0.29/0.24l/min respectively. Difference in splenic arterial and venous flow means (1.35 and 1.11) could be explained by opening of retroperitioneal (for example, natural spleno-renal shunts etc) collaterals.

Elevated splenic artery and vein blood flow were significantly increased in patients with clinically significant portal hypertension compared with C1 and C2 groups ($p<0.001$) and are the evidence of development a hyperdynamic circulatory state in the splanchnic circulation. According to obtained data the threshold mean of esophageal varix appearance (or any other related to portal hypertension events) could be marked at SAVBF range of 0.8–1.0l/min.

Conclusion: Splenic artery blood flow measurement is a safe non-invasive diagnostic procedure in patients with hepatic portal hypertension. It could be regarded as a predictive factor of development of portal hypertension complications. The measurement of SAVBF/SVVBF might be beneficial to make a decision to activate primary prophylaxy of first variceal hemorrhage in patients with cirrhosis but further trials are needed. Obtained data support the concept of applying partial splenic embolization for effective portal pressure control and primary prophylaxy of index variceal bleeding.