

Assessing the Severity of Portal Hypertension: Is Liver or Spleen Stiffness Measurement an Alternative to the Gold Standard, Hepatic Vein or Porto-Systemic Pressure Gradient?

Yasmin A Ali¹, Paul M Haste², Raj Vuppalanchi³

¹ Indiana University School of Medicine;

² Indiana University School of Medicine, Department of Clinical Radiology & Imaging Sciences;

³ Indiana University School of Medicine, Department of Gastroenterology and Hepatology

Introduction: Liver stiffness measurement (LSM) and spleen stiffness measurement (SSM) are increased in patients with cirrhosis and portal hypertension (PH). However, increased SSM values are associated with presence of esophageal varices. Currently, the gold standard for risk stratification in patients with compensated advanced chronic liver disease (cACLD) is by measurement of portal pressure through assessment of hepatic vein or porto-systemic pressure gradient (HVPG and PSPG). However, these procedures are invasive, and either LSM or SSM may be a non-invasive alternative.

Aim: We aimed to investigate the relationship between LSM or SSM and HVPG/PSPG and examined the diagnostic accuracy for identification of clinically significant PH (≥ 10 mm Hg) or severe PH (≥ 12 mm Hg).

Methods: A retrospective study (IRB Protocol #19230) allowed us to identify patients who had who undergone portal pressure measurements (HVPG or PSPG). A total of 36 patients also had SSM values. Of these, 29 patients carried a hepatic cause of PH, while the remaining had pre-hepatic (n=4) and post-hepatic (n=3) etiology.

Results: The median age was 58 years (range: 25-71) with 52% male and 83% with cirrhosis. The median LSM and SSM were 35.7 kPa (range: 7.4-75.0, normal ≤ 7.0 kPa) and 43.8 kPa (range: 20.7-100, normal ≤ 21.0 kPa). Both LSM ($r = 0.42$, P-value = 0.02) and SSM ($r = 0.45$, P-value: 0.01) correlated significantly with HVPG/PSPG. The diagnostic accuracy for both LSM and SSM for clinically significant PH was good for LSM (AUROC 0.76, 95% CI: 0.58-0.94) and excellent for SSM (AUROC: 0.81, 95% CI: 0.65-0.98). The diagnostic accuracy of LSM and SSM was lower for severe PH [AUROC 0.71 (P-value = 0.06) and 0.67 (P-value = 0.1) for LSM and SSM, respectively].

Conclusion: Both LSM and SSM correlate with portal pressure measurements and provide diagnostic accuracy to identify patients with clinically significant, but not severe, PH.