Changes in Transient Elastography with Glucagon-like Peptide-1 Receptor Agonist Use in Metabolic Dysfunction-Associated Steatotic Liver Disease

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Introduction: Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) has increased in global prevalence to 20-30% and is projected to become the leading cause of liver transplantation in the United States. Recent guidelines recommend the use of glucagon-like peptide-1 receptor agonists (GLP-1RAs) in patients with MASLD. This study assessed the effects of GLP-1RAs in patients with MASLD, as measured by changes in Vibration-Controlled Transient Elastography (VCTE) and metabolic parameters in a real-world clinical scenario.

Methods: We retrospectively analyzed 96 patients with MASLD who underwent VCTE at baseline and follow-up. Changes in controlled attenuation parameter (CAP), liver stiffness measurement (LSM), weight, BMI, blood pressure, liver enzymes, hemoglobin A1c, and lipids were compared between GLP-1RA users and non-users, as well as responders and non-responders based on a CAP change > 38 dB/m, using two sample t-tests or Wilcoxon rank sum tests.

Results: GLP-1RA users had significant improvements in weight (-8.1 kg vs. -3.5 kg p=0.009), BMI (-2.9 kg/m^2 vs. -1.3 kg/m^2 p=0.012), ALT (-15.0 IU/L vs. -4.0 IU/L p=0.017), AST (-5.0 IU/L vs. -1.0 IU/L p=0.021), hemoglobin A1c (-0.7% vs. 0.1% p=0.019), and CAP (-59.9 dB/m vs. -29.1 dB/m p=0.016). Responders had significant improvements in weight (-9.2 kg vs. -1.9 kg p=<0.001), BMI (-3.3 kg/m^2 vs. -0.7 kg/m^2 p=<0.001), diastolic blood pressure (-6.1 mmHg vs. -0.7 mmHg p=0.028), hemoglobin A1c (-0.8% vs. 0.3% p=<0.001), and LSM (-1.5 kPa vs. 0.1 kPa p=<0.001).

Conclusions: Patients with MASLD treated with GLP-1RAs showed significant improvements in CAP and metabolic parameters with weight loss as the likely mechanism for liver improvement. CAP change >38 dB/m is linked to improvements in weight, LSM, and other metabolic parameters, suggesting the utility of VCTE in the surveillance of MASLD.