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INVITED COMMENTARY

Muscle Mass Effect: The Importance of Diagnosing and Treating Sarcopenia in Patients with Advanced Chronic Liver Disease

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Throughout the past decade, research on and awareness of sarcopenia (reduced muscle mass) in patients with advanced chronic liver disease (ACLD) have increased among hepatologists, with several recent publications reporting its prevalence, impact on hepatic outcomes, and diagnostic modalities. Sarcopenia, highly prevalent in ACLD patients, negatively impacts hepatic outcomes of patients on and off the liver transplant waiting list [1, 2]. Most importantly, inferior outcomes appear to be independent of the degrees of synthetic dysfunction and/or portal hypertension [3], suggesting that sarcopenia itself might be an important treatment target in improving clinical outcomes in ACLD patients.

Though treatment strategies to overcome sarcopenia are urgently warranted, the most feasible diagnostic approach to sarcopenia is still being investigated. International guidelines currently recommend the widely known computerized tomography (CT)-derived skeletal muscle index (SMI) as the primary diagnostic tool to evaluate and diagnose sarcopenia [4]. The SMI is calculated using specialized imaging software that analyzes the cross-sectional area of abdominal skeletal muscles (psoas, paraspinal, and anterior abdominal wall muscles), at the level of the third lumbar vertebra (L3), normalized for height. Nevertheless, since this imaging software is usually only available to radiologists, it is not easily accessible to hepatologists in daily clinical practice, leading researchers to investigate other CT-based muscle measurements to simplify the diagnosis of sarcopenia in ACLD patients. The "transversal psoas muscle thickness" (TPMT), easily determined using any standard radiological monitor, has been proposed as an easy-to-measure method to evaluate muscle mass, since no special imaging software is needed. Its excellent prognostic value [1] and non-inferiority in regard to prognostication when compared to SMI [5, 6] are well documented.

Since studies reporting on TPMT values have used two different anatomical locations for its measurement: the umbilicus [7, 8], which is an easy-to-find radiological landmark for the non-radiologist, and the 3rd lumbar vertebra (similar to SMI), the optimal location for TPMT measuring has yet to been determined. The study by Li et al. [6] in this issue of *Digestive Diseases and Sciences* adds important data to the field showing that TPMT measured at both the umbilicus (TPMU) and the 3rd lumbar vertebrae (TPML) have similar prognostic value as L3-SMI in patients with ACLD undergoing transjugular intrahepatic portosystemic shunt (TIPS) placement. Most importantly though, TPML showed a superior consistency than L3-SMI in diagnosing sarcopenia. This information, by narrowing the sarcopenia measurement landmarks to the L3-SMI or L3-TPMT, promises to simplify this important measurement for non-radiologists.

Regardless, there is one major point that needs to be emphasized—the difference between using L3-SMI or L3-TPMT for sarcopenia diagnosis might merely be diagnostic fine tuning, since the association with liver-related outcomes is strong for both indices. Therefore, health care facilities treating ACLD patients should try to incorporate a standardized method (either L3-SMI or L3-TPMT) that is most feasible for their institution, in order to have muscle mass evaluated on every CT report.

Despite advances in diagnosis, no significant treatments have been identified to treat sarcopenia in ACLD. While promising data regarding hormone substitution in male patients [9] and TIPS placement [10] have been published, there is currently no breakthrough treatment approach that shows that improving low muscle mass also translates into improved clinical outcomes in ACLD patients, possibly since sarcopenia is more likely the end result of several pathological processes including chronic inflammation [11].

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Therefore, treatments that target its root causes, such as hormone substitution, nutritional and/or exercise interventions [12], or the combination of the above should be studied in large randomized controlled trials investigating treatment for sarcopenia. Until that occurs, clinicians should continue to evaluate muscle mass in all ACLD patients and recommend what we currently know might help—proper nutrition and exercise!

Declarations

Conflict of interest The author have declared that there are no conflict of interest.

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