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Editorial

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# The Impact of Sarcopenia and Its Rate of Change on Prognostic Value of Liver Cirrhosis

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▸ See the article "Presence of Sarcopenia and Its Rate of Change Are Independently Associated with Long-term Mortality in Patients with Liver Cirrhosis" in volume 33, e299.

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Sarcopenia is a syndrome characterized by skeletal muscle loss with aging, which is prevalent in adults with cancer and those with chronic comorbidities such as liver cirrhosis.[1] The prevalence of concomitant sarcopenia is reported to be > 40% in cirrhosis.[2] Sarcopenia has emerged as an important and novel prognostic predictor in a variety of clinical conditions. Several studies have reported that sarcopenia is associated with a poor prognosis, as well as reduced survival, before and after liver transplantation. Moreover, the model for end-stage liver disease (MELD)—sarcopenia score, which combines MELD score and the psoas muscle area score, was found to be better than the MELD scores in predicting waiting-list mortality, and its predictive value was found to be superior to that of the MELD score in several studies.[3] However, there were few studies that performed repeat skeletal muscle area measurements using serial imaging. Then, it is not known whether the rate of skeletal muscle depletion is associated with a poor prognosis in patients with liver cirrhosis.

In a retrospective review of 131 patients, Jeong et al.[4] investigated the prognostic impact of the rate of skeletal muscle depletion in liver cirrhosis and compared it with the impacts of Child-Pugh (CP) score, MELD score and hepatic venous pressure gradient (HVPG). Among the patients, 64 patients (48.9%) were diagnosed with sarcopenia and the mean relative change in skeletal muscle area per year (ΔSMA/y) was −0.88% ± 8.69%. During a median follow-up period of 46.2 months (range, 3.4–87.6), survival was significantly higher in patients without sarcopenia than in those with sarcopenia (log-rank test, $P = 0.025$). Moreover, age, CP score, HVPG, presence of sarcopenia and ΔSMA/y were independently associated with mortality in multivariate analyses. Cumulative survival was significantly lower in patients with ΔSMA/y < −2.4% than those with ΔSMA/y ≥ −2.4% (log-rank test, $P < 0.001$). In analysis of the presence of sarcopenia and the rate of skeletal muscle depletion together, patients without sarcopenia & ΔSMI/y ≥ −2.4% showed the best survival rate. Jeong et al.[4] therefore claimed that both the presence of sarcopenia and its rate of change are associated with long term mortality in patients with liver cirrhosis, independent of liver function and portal hypertension. Accordingly, they suggest that efforts to reverse muscle mass loss improve the prognosis of patients with cirrhosis. However, a few limitations should be considered.

In recent years, according to different populations with different endpoints, patients with cirrhosis and sarcopenia may be exposed to higher mortality. However, it must be noted

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that the prognostic value of muscle mass has been evaluated in populations of patients where men were largely predominant. In some series where men and women were analyzed separately, it appeared that sarcopenia was predictive of mortality in men but not in women, and sarcopenia was more common in men than in women (58.5% vs. 24.3%, $P < 0.001$).[4] However, gender-specific prognostic implications of sarcopenia and the rate of skeletal muscle depletion were not described in detail.

In this study, presence of sarcopenia is based on the pre-established cut-off value of Prado et al.[5] (≤ 52.4 $cm^2/m^2$ in men and ≤ 38.5 $cm^2/m^2$ in women) for cancer patients. However, efforts have been made by several groups to identify cut-off values based on gender and body mass index that would define sarcopenia in patients with cirrhosis. This approach where sarcopenia is considered as "present" or "absent" may be too restrictive. Indeed, sarcopenia may rather represent a continuum and a continuous variable may provide more granular prognostic information. In this regard, it is worth evaluating the prognostic value of change of skeletal muscle depletion on survival. However, the authors concluded that the −2.4% defined as a criterion for high risk group for loss of skeletal muscle mass is lacking in detail as to how much the muscle is clinically reduced or how it can be perceived by the eyeball test. Also, the range of interval between both computed tomography scan measurements was too wide from 13 to 61 months. Therefore, we wonder when it is appropriate to measure change of skeletal muscle depletion in clinical practice. Such measures and adequate criteria for changes in muscle mass may clarify the prognostic value of sarcopenia in patients with cirrhosis.

Despite its limitations, as mentioned above, this study demonstrates that changes in muscle mass, as well as the presence of sarcopenia, are important prognostic factors in patients with cirrhosis. Undoubtedly, these concepts will be an important part of the care of the patient with cirrhosis in the future.

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