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Impact Of Sarcopenia Using Third Lumbar And Anterior Thigh Skeletal Muscle Index On Clinical Outcomes In Liver Transplantation Recipient

Manuel LIM[1], Jong Man KIM*[1]

[1]*Department Of Surgery, Samsung Medical Center, REPUBLIC OF KOREA*

Background : Sarcopenia is defined as loss of muscle mass and function. It has been reported as a significant risk factor for outcome after Liver transplantation (LT) as well as waitlist mortality in end-stage liver disease patients. Although there are various imaging modalities and measurement methods for diagnosing sarcopenia, the gold standard is not clear. The purpose of this study is to analyze the effect of sarcopenia on outcome in LT patients using previously known third lumbar (L3)-skeletal muscle index (SMI) cut-off values and newly calculated anterior thigh (AT)-SMI cut-off values.

Methods : Two hundred twenty-two patients who underwent living and deceased donor liver transplantation in our center from Sep 2018 to Dec 2020 were analyzed. L3-SMI and AT-SMI were obtained by measuring preoperative computed tomography scans with semiautomatic software. For L3-SMI, the cut-off values reported in other previous studies were applied (50 cm2/m2 in males, 39 cm2/m2 in females). For AT-SMI, the optimal cut-off value was obtained by the ROC curve for sarcopenia.

Results : The prevalence of sarcopenia diagnosed by L3-SMI was 46% (103/222) and by AT-SMI was 52% (116/222) in our cohort. The cut-off values of AT-SMI obtained by ROC curve were 13.3 cm2/m2 for female (AUC=0.919, P<0.001) and 16.9 cm2/m2 for male (AUC=0.844, P<0.001). Patient and graft survival rates in the sarcopenia group by L3-SMI were significantly lower than in the non-sarcopenia group (P=0.002, P=0.013), and those in the sarcopenia group by AT-SMI were also significantly lower than in the non-sarcopenia group (P=0.006, P=0.007). AT-SMI was identified as one of the independent prognostic factors in both graft survival and patient survival in multivariable cox analysis, whereas L3-SMI was not (HR, 10.240; 95% CI, 1.303-80.483; P =0.027).

Conclusions : Both sarcopenia groups by L3-SMI and AT-SMI showed significant differences in patient survival and graft survival. However, AT-SMI was only identified as an independent prognostic factor in both graft and patient survival. It implies that AT-SMI may be a better option than L3-SMI to evaluate sarcopenia in LT recipients.

Corresponding Author : **Jong Man KIM** (yjongman21@gmail.com)