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Effects of pretransplant sarcopenia to clinical outcomes after liver transplantation

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INTRODUCTION: Sarcopenia is a geriatric syndrome which is defined as the decrease in muscle mass, muscle strength and muscle function.Low skeletal muscle mass and quality before transplantation are independent risk factors for mortality after liver transplantation.In this study, muscle mass and muscle quality were evaluated before transplantation and the effects of these measurements on the mortality rate after liver transplantation were investigated.

METHODS: We retrospectively analyzed 54 adult patients who underwent liver transplantationat our center between January 2015 and October 2018. Demographic characteristics, computed tomography (CT) and laboratory findings of these patients were reviewed.SMI (skeletal muscle mass index), VSR (visceral-to-subcutaneous adipose tissue area ratio) and IMAC (intramuscular adipose tissue content) were measured from axial CT sections. The normal cut-off values of SMI, VSR and IMAC were calculated from CT images of 54 healthy donors between 2013 and 2018.The cutoff values were determined for men and women separately using the median data.

RESULTS: The median age of 54 patients was 48.9 years (22–67 years). Fourty of 44 patients were male (74%).Thirty-six patients (66,6 %) had living donor transplantation, while 18 had (33.3%) had cadaveric.The indications of transplantation were hepatocellular carcinoma (HCC) in 20 patients (37%),viral hepatitis in 13 (24%),cryptogenic in liver cirrhosis in 5 (9,2%), cholestatic diseases in 4 (7,4%),toxic in 3 (5,5%),metabolic in 3 (5,5%),vascular liver diseases in 2 (3,7%),alcoholic liver disease in 1 (1,8%) and other causes in 2 (3,7%).A total of 6 (11.1%) patients died in this follow-up period.Forty-four patients (81.4%) had CT scan before the operation.There were 33 patients (75%) with preoperative low SMI (low muscle mass), 35 patients (79.5%) with high IMAC (low muscle quality),and 29 patients (65.9%) with high VSR (visceral adiposity).No significant correlations were found between pretransplant VSR, SMI and IMAC and other parameters (donor age, MELD-Na score, operative time,operative blood loss,BMI and length of ICU stay ($p > 0.05$).There were significant relationships between SMI and patient hemoglobin level (12.6 versus 11.1 $p=0.023$) and IMAC and age (57 versus 51 $p=0.05$). The 1- and 3-year survival probabilities in patients with low SMI and normal SMI were 90.9% and 90.9% versus 86.1% and 90.9%, respectively. The 1- and 3-year survival probabilities in patients with high VSR and normal VSR were 86.2% and 100% versus 86.2 %and 87.5%, respectively.The 1- and 3-year survival probabilities with high IMAC were 88.6 % and 84.1%. No patients with normal IMAC were lost in follow up period; so the 1 and 3 year survivals were 100%.

CONCLUSION: Sarcopenia is seen in a significant number of patients with cirrhosis awaiting liver transplantation. Preoperative SMI, VSR and IMAC can predict post-transplant mortality.

Keywords: liver transplantation, mortality, sarkopenia

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