Dynamic relationship between surrogates of skeletal muscle mass and MELD-Na score in three cirrhotic patients under cell-free and concentrated ascites reinfusion therapy

Yoshiyuki Nakatsuji,1 Kaori Yamamoto,1 Mitsutaka Yoshizawa2

DESCRIPTION
We studied the relationship of the score of model for end-stage liver disease with incorporated serum sodium concentration (MELD-Na) with parameters on sarcopenia using bioelectrical impedance analysis (BIA: InBody770, Inbody Japan Inc., Tokyo) in patients undergoing cell-free and concentrated ascites reinfusion therapy (CART).1–3 When BIA was not available in a patient, serum creatinine (SCr; normal range: 0.6–1.2 mg/dL) was used instead. We measured creatinine (SCr; normal range: 0.6–1.2 mg/dL) and total cholesterol (TC; normal range: 130–220 mg/dL) levels before and after the respective bending points.

Figure 1 Clinical courses of case 1 and case 2. In case 1, the bending points were at 9 months of model for end-stage liver disease with serum sodium (MELD-Na) score and at 5 months of skeletal muscle index (SMI). In case 2, the bending points were at 5 months of MELD-Na score and at 3 months of SMI. The SMI at 12 months in case 1 and at 6 and 7 months in case 2 were not available due to deterioration of the patient’s condition. All the data of MELD-Na in case 1 have been measured and written on a graph. The measured grip strength was 22.0 kg on the right and 22.1 kg on the left in case 1, 19.0 kg on the right and 18.8 kg on the left in case 2.

Figure 2 The changes of skeletal muscle index (SMI) and model for end-stage liver disease with serum sodium (MELD-Na) score before and after the respective bending points. The error bars represent the standard errors. The values of SMI or MELD-Na score at the bending points were set to 1, respectively. (A) Student’s t-test showed significant difference of p=0.014 between SMI before (n=7) and after (n=6) the bending points. (B) Student’s t-test showed significant difference of p=0.014 between MELD-Na score before (n=11) and after (n=7) the bending points.

Figure 3 Clinical course of case 3. The unit for serum creatinine is 10−1 mg/dL. The cell-free and concentrated ascites reinfusion therapy implementation period was completed by 7 months. The measured grip strength was 25.5 kg on the right and 25.0 kg on the left in case 3. An irregularly measured skeletal muscle index level showed 6.9 kg/m².

1Department of Gastroenterology, Marunouchi Hospital, Matsumoto, Nagano, Japan
2Department of Clinical Engineering, Marunouchi Hospital, Matsumoto, Nagano Prefecture, Japan

Correspondence to Dr Yoshiyuki Nakatsuji; nakatsuji_y@marunouchi.or.jp

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0.63–1.05 mg/dL) was used as a surrogate marker for skeletal muscle mass. Sarcopenia was reported to reduce life quality and worsen prognosis with liver cirrhosis (LC). Our three male patients suffered from decompensated LC, case 1 with non-alcoholic steatohepatitis with type 2 diabetes mellitus at age 83, case 2 with alcoholic liver disease with primary biliary cholangitis at age 81 and case 3 with alcoholic LC at age 64. They had CART administrations almost every 2 weeks to control ascites. BIA was performed every 1–3 months to estimate their nutritional states, and calculated skeletal muscle index (SMI: (skeletal muscle mass)/(body height)^2, kg/m^2). Handgrip strength was assessed with a digital grip strength dynamometer (T.K.K.5401 GRIP D; Takei Scientific Instruments, Niigata, Japan). Sarcopenia was diagnosed using the Japan Society of Hepatology criteria, and defined as grip strength <26 kg and SMI <7.0 kg/m^2 for man in 2016. As a result, SMI and MELD-Na score showed reciprocal trends, with the MELD-Na score beginning to rise 2–4 months after SMI began to decline (figure 1). The bending points were considered as the boundary between the

Figure 5 Coronal abdominal CT at porta hepatis showed that the liver area size was 4888 mm^2 in case 1.

Figure 6 Coronal abdominal CT at porta hepatis showed that the liver area size was 5894 mm^2 in case 2.
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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

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