

Sarcopenia index calculated from blood tests reflects whole body skeletal muscle mass: results from community health checkup using whole-body CT.

Soshi Hirata¹, Naoki Okubo¹, Kazufumi Hisamoto¹, Takashi Seya¹, Tsuyoshi Goto¹, Shuji Nakgawa², Yuji Arai², Kenji Takahashi¹

¹Department of Orthopaedics, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto, Japan

²Department of Sports and Para-Sports Medicine, Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto, Japan

Email of Presenting Author: soshi2@koto.kpu-m.ac.jp

Disclosures: Soshi Hirata (N), Naoki Okubo (N), Kazufumi Hisamoto(N), Takashi Seya(N), Tsuyoshi Goto (N), Shuji Nakagawa (N), Yuji Arai(N), Kenji Takahashi (N)

Abstract body using the following format:

Introduction:

In recent years, early detection of sarcopenia has been considered essential in Japan to extend healthy life expectancy. The assessment of skeletal muscle mass using DXA or BIA is required for the diagnosis of sarcopenia. However, these methods cannot be performed without specialized equipment therefore unsuitable for early detection in routine health checkups. If sarcopenia could be objectively detected by blood tests, it would be possible to identify asymptomatic individuals with sarcopenia at an earlier stage. We have previously reported that the sarcopenia index (SI), calculated from serum creatinine and cystatin C, is useful for detecting sarcopenia in patients with femoral fractures. The aim of our study is to verify the utility of SI for detecting sarcopenia in community-dwelling individuals undergoing health checkups, using a comprehensive evaluation including whole-body CT.

Methods:

In total, 965 individuals (394 men and 571 women) who participated in health checkups in the Kyotango region (northern Kyoto, Japan) between January 2017 and June 2024. The mean age was 74.1±6.3 years for men and 72.9±5.5 years for women. SI was calculated from blood tests, while handgrip strength, walking speed, and SMI using BIA were measured. Correlations between SI and each of these parameters were evaluated. Sarcopenia was then diagnosed based on the AWGS 2019, and the diagnostic ability of SI was assessed using ROC analysis. In addition, whole-body CT images were analyzed, and cross-sectional slices at T4, T12, L3, the mid-thigh, and the mid-calf were processed with dedicated image analysis software to measure skeletal muscle cross-sectional area (CSA) and mean CT value (CTV). Correlations between SI and CSA, CTV, as well as a composite index (CI: CSA × CTV) at each slice were also examined.

Results:

SI showed positive correlations with handgrip strength, walking speed, and SMI in both men and women. A total of 73 participants (26 men and 47 women) were diagnosed with sarcopenia. Regarding the diagnostic ability of SI for sarcopenia, AUC was 0.714 (95% CI: 0.622–0.806) in men and 0.771 (95% CI: 0.698–0.843) in women. In addition, CT analysis revealed that SI was positively correlated with CSA, CTV, and CI at all slices in both men and women.

Discussion:

Creatinine, a marker of renal function, is produced in skeletal muscle; therefore, by taking the ratio with another renal function marker, SI is considered to reflect skeletal muscle mass. In this study, SI was found to correlate with whole-body skeletal muscle mass, suggesting that SI would serve as an indicator reflecting whole-body skeletal muscle mass.

Significance/Clinical Relevance:

SI would serve as an indicator reflecting whole-body skeletal muscle mass.

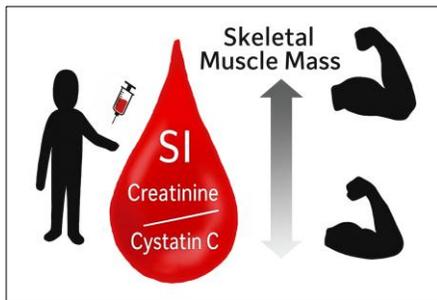


Figure1. sarcopenia Index

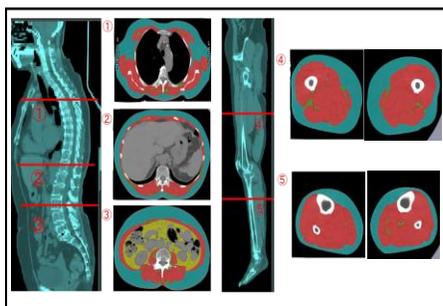


Figure2. Whole body CT scan analysis

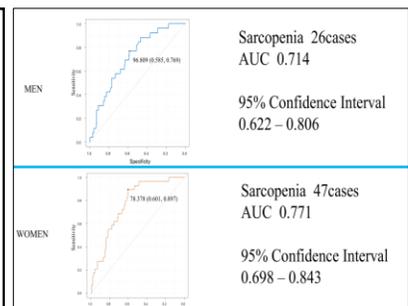


Figure3. ROC curve