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Clinical assessment for diagnosis of sarcopenia in patients with stroke

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Background

Sarcopenia is characterized by decreased muscle mass, muscle strength, and physical performance. The current diagnostic assessments include muscle mass measurements (dual X-ray absorptiometry or bioimpedance analysis), handgrip strength for muscle strength and usual gait speed for physical performance. However, clinical diagnosis of sarcopenia is limited in stroke patients due to stroke-related hemiplegia. We investigated the alternative variables to assess the sarcopenia in stroke patients.

Methods

Forty patients (17 male, 23 female; mean age of 65.5 years) with first ever ischemic or hemorrhagic stroke were included. Patients with history of neuropathy or myopathy, and severe medical comorbidities were excluded. Muscle mass was measured by the Skeletal Muscle Index (SMI) of bioelectrical impedance analysis with InBody S10, and sonographic muscle thickness measurement of vastus intermedius (VI), rectus femoris (RF), tibialis anterior (TA), gastrocnemius, and biceps brachii (BB) muscles. Muscle strength was assessed by handgrip strength and Medical Research Council (MRC) sum score. Physical performance was measured by 4-m gait speed, 6-minute walk test (6MWT), and Berg Balance Scale (BBS). Correlations between each assessment in three categories were analyzed.

Results

In terms of muscle mass, the SMI correlated with all of the affected and unaffected muscle thickness. In particular, the sonographic muscle thickness of TA ($r=0.794$, $p<0.01$) muscle showed the highest correlation coefficients among the muscles. Regarding muscle strength, the MRC sum score correlated with the affected ($r=0.373$, $p<0.01$) and unaffected ($r=0.398$, $p<0.01$) handgrip strength. For physical performance, BBS correlated with the 6MWT ($r=0.832$, $p<0.01$) and 4-m gait speed ($r=0.833$, $p<0.01$).

Conclusion

These results suggest that the MRC sum score and BBS could be alternative assessments for handgrip strength and usual gait speed for the diagnosis of sarcopenia in stroke patients. In addition, TA muscle could be used for the sonographic muscle thickness

measurement. Further study is needed to determine the cutoff values for MRC sum score, BBS, and muscle thickness measurements for the diagnosis of sarcopenia.