

# Investigating the relationship between sarcopenia and post-stroke depression



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## Objectives

Post-stroke depression, affecting approximately 39-52% of stroke survivors, is a common yet one of the serious complications after stroke. It is closely associated with various health issues, including chronic diseases, increased morbidity, and mortality. Recently, there have been studies reporting the association between depression and sarcopenia, which is defined by progressive loss of muscle mass, strength, and/or function. However, studies on the relationship between post-stroke depression and sarcopenia are scarce. Therefore, this study aimed to investigate the association between post-stroke depression and sarcopenia.

## Methods

This study was a retrospective observational study. Patients who experienced stroke from September 2022 through September 2023 were included in the study. Dual-Energy X-ray Absorptiometry (DXA) was performed to measure appendicular skeletal muscle mass (ASM). Sarcopenia was defined as those with ASM/(height)<sup>2</sup> below 7.0kg/m<sup>2</sup> (male) and 5.4kg/m<sup>2</sup> (female). Depression was assessed using the Beck Depression Inventory (BDI).

## Results

A total of 175 post-stroke patients were included in the analysis, with sarcopenia affecting 64.6% of the participants. Table 1 shows the baseline characteristics of the participants. Those with sarcopenia are represented with poorer balance and cognition, reduced hand grip strength, and more assistance with activities of daily living (ADL). However, depression measured by BDI did not significantly differ between patients with and without sarcopenia. The Pearson correlation test revealed no significant association between BDI scores and ASM/h<sup>2</sup>, body mass index, balance, cognition, or ADLs. Higher BDI scores were associated with older age and decreased grip strength.

Table 1. Baseline characteristics of the participants

	Non-Sarcopenia (n=62)	Sarcopenia (n=113)	p-value
Age	68.3 ± 13.4	67.8 ± 14.5	0.844
Sex (male)	51 (82.3%)	58 (51.3%)	<0.001
Hypertension (yes)	49 (79.0%)	86 (76.1%)	0.800
Diabetes (yes)	21 (33.9%)	43 (38.1%)	0.700
ASM/h <sup>2</sup>	6.1 ± 0.7	4.4 ± 1.0	<0.001
BMI (kg/m <sup>2</sup> )	23.3 ± 3.3	19.8 ± 5.5	<0.001
Hemoglobin (g/dL)	12.3 ± 1.8	11.8 ± 1.7	0.083
Albumin (g/dL)	3.9 ± 0.5	3.8 ± 0.5	0.359
Total Protein (g/dL)	6.6 ± 0.6	6.6 ± 0.7	0.530
CRP (mg/L)	10.4 ± 15.5	10.4 ± 16.6	0.981
Berg balance scale	23.2 ± 21.8	12.7 ± 17.6	0.001
Modified Barthel Index	41.9 ± 31.6	26.0 ± 26.5	0.001
MMSE	17.7 ± 9.8	14.0 ± 9.4	0.020
Hand grip strength (kg)	27.4 ± 10.3	17.2 ± 6.2	<0.001
BDI	8.9 ± 7.1	9.9 ± 10.3	0.467

Table 2. Association between BDI and parameters

	Correlation coefficient	p-value
Age	0.187	0.013
ASM/h <sup>2</sup>	-0.018	0.812
BMI (kg/m <sup>2</sup> )	0.014	0.851
Berg balance scale	0.034	0.649
Modified Barthel Index	0.008	0.918
MMSE	0.151	0.054
Hand grip strength (kg)	-0.281	0.006

## Conclusion

In this study, post-stroke depression was not directly correlated with muscle mass as measured by DXA. However, a potential correlation was observed between depression and muscle strength, as assessed through hand grip strength tests. Future studies with a larger population are needed to support the result.