Low skeletal muscle mass is an independent risk factor for arterial stiffness.

Tabara Y, Setoh K, Nakayama T, Matsuda F, and the Nagahama study group
Kyoto University Graduate School of Medicine

Background

We have shown that **low muscle mass** was associated with increased **arterial stiffness** in **older adults**.

[Community-residents aged 55 years or older]

Kohara K, Okada Y, Ochi M, Ohara M, Nagai T, Tabara Y, Igase M.
J Cachexia Sarcopenia Muscle. 2017; 8:557-566.

AIM

to clarify whether the association between muscle mass and arterial stiffness could be extrapolated into other population including **a wide age range individuals**.

Methods

The Nagahama Study

A longitudinal study based on community residents in Nagahama, a rural city of 125,000 inhabitants located in central Japan.

- 30 to 74 years old at recruitment
- living independently without physical impairment or dysfunction

Skeletal muscle index:

SMI

Appendicular muscle mass was measured using a bioelectrical impedance analysis device. SMI was calculated as follows;

Appendicular muscle mass (kg) / body height² (cm)

Brachial-to-ankle pulse wave velocity: baPWV

Arterial stiffness was assessed by pulse wave velocity measured between brachia and ankle. Pulse waveforms were detected using a cuff connected to a plethysmographic sensor.

Results

Characteristics of study participants, N = 9,740

Age, years	57.9 ± 12.4
Sex, men %	32.2
BMI, kg/m ²	22.2 ± 3.3
SMI, kg/m ²	6.67 ± 0.98
Smoking, current / past / never %	10.7 / 21.2 / 68.1
Systolic / diastolic BP, mmHg	124 ± 18 / 72 ± 11
baPWV, cm/sec	1,285 ± 236

baPWV

- Higher in men
men: 1,346 ± 236 cm/sec
women: 1,256 ± 230 cm/sec
- Positive association with SBP
r = 0.669
- Higher in obese individuals
Obese: 1,332 ± 225
Non-obese: 1,274 ± 237

	Total		<65 years old		≥65 years old	
	β	p	β	p	β	p
Sex, men	0.16	<0.001	0.20	<0.001	0.10	<0.001
Age, years old	0.42	<0.001	0.31	<0.001	0.20	<0.001
Height, cm	-0.06	<0.001	-0.07	<0.001	-0.01	0.702
Weight, kg	0.08	<0.001	0.12	<0.001	0.09	0.001
SBP, mmHg	0.44	<0.001	0.54	<0.001	0.50	<0.001
Brinkman index	0.00	0.702	0.00	0.948	0.01	0.561
HT medication	0.09	<0.001	0.08	<0.001	0.10	<0.001
SMI, kg/m ²	-0.20	<0.001	-0.26	<0.001	-0.19	<0.001

Conclusion

Low skeletal muscle mass is an independent risk factor for **arterial stiffness** even in a **middle-aged** population.

Possible mechanisms may be ...

- ✓ insulin resistance
- ✓ protein-calorie malnutrition or physical inactivity