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## BACKGROUND

- Peripheral arterial disease (PAD) is the manifestation of atherosclerotic plaque in the larger arteries of the legs, which results in impaired blood flow to the lower extremities.
- Markers of vascular health, such as endothelial function and arterial stiffness, have been shown to be attenuated in patients with PAD.
- Endothelial dysfunction specifically has been shown to be associated with poor nitric oxide (NO) bioavailability. Nitrate ( $\text{NO}_3^-$ ), an NO-donor, has demonstrated beneficial effects on improving NO bioavailability and vascular parameters in patients with PAD.
- Previous studies have utilized unspecified doses of beetroot juice (high  $\text{NO}_3^-$  content) for patients with PAD, therefore a standardized dose of beetroot juice has not yet been elucidated. Therefore, the effects of a body mass-normalized dose of  $\text{NO}_3^-$  on vascular parameters in patients with PAD has been examined in this study.

## PURPOSE

- To examine the impacts of a  $\text{NO}_3^-$  supplement, specifically a body-mass normalized dose of beetroot juice, on endothelial function, arterial stiffness, and central and peripheral blood pressure (BP) in patients with PAD.
- Hypothesis: it was hypothesized that acute intake of  $\text{NO}_3^-$  would improve vascular function.

## METHODS

- 2 patients with PAD (stage II-III, age around 73) had vascular measurements taken pre- and post-beetroot juice ingestion.
- Beetroot juice dosage was  $\sim 0.11 \text{ mmol NO}_3^-/\text{kg}$  body mass
- Height, mass, body composition, and grip strength were measured to determine participant characteristics.
- Vascular measurements including resting heart rate, peripheral BP, central BP, augmented pressure, deceleration time, endothelial function (flow-mediated dilation), and arterial stiffness (carotid-to-radial pulse-wave velocity and augmentation index) were taken pre- and post-nitrate ingestion.

## METHODS

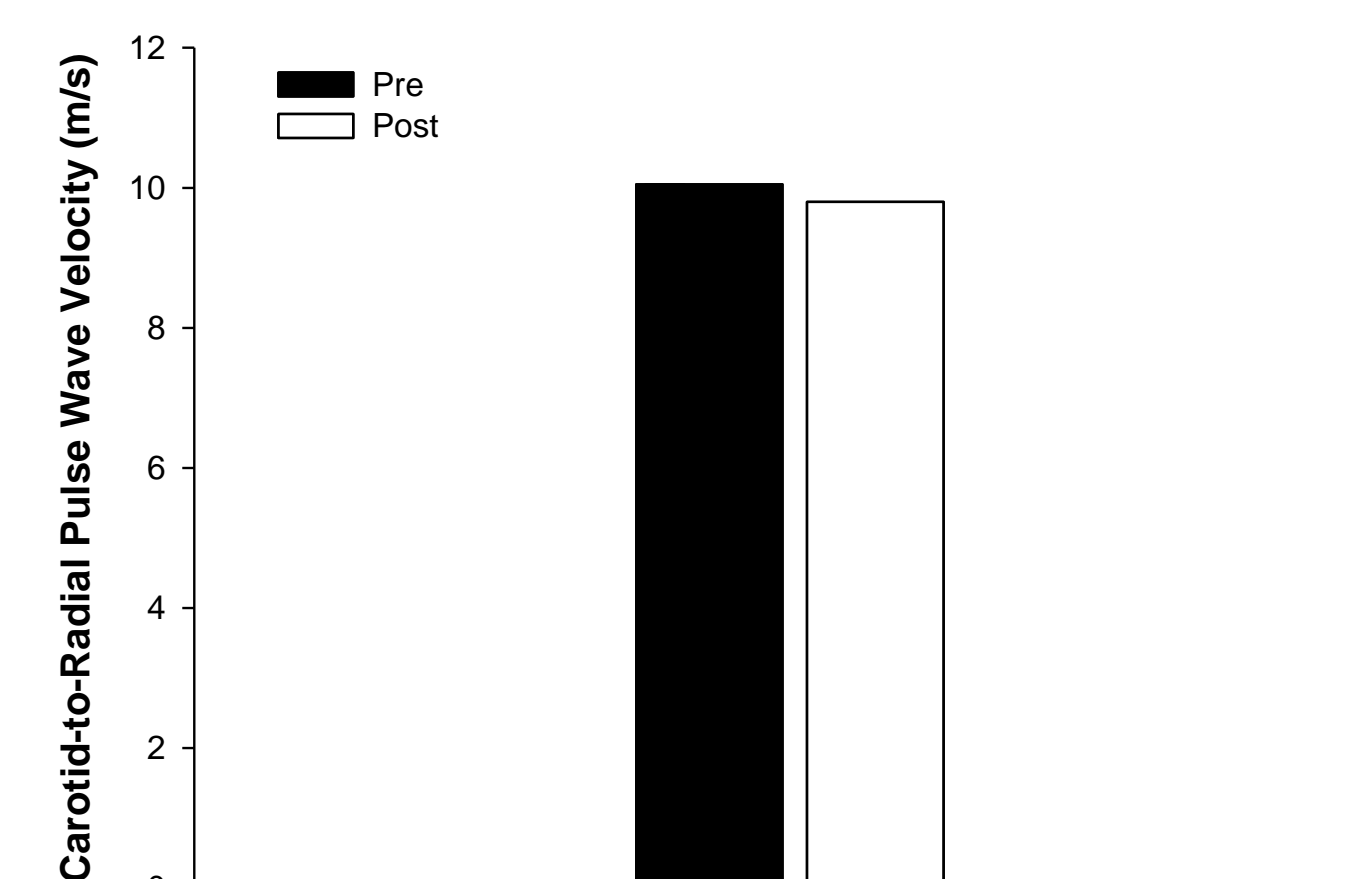


**Flow-mediated dilation:** non-invasive measurement of endothelial function using a trigger-monitor EKG system and Doppler ultrasound.

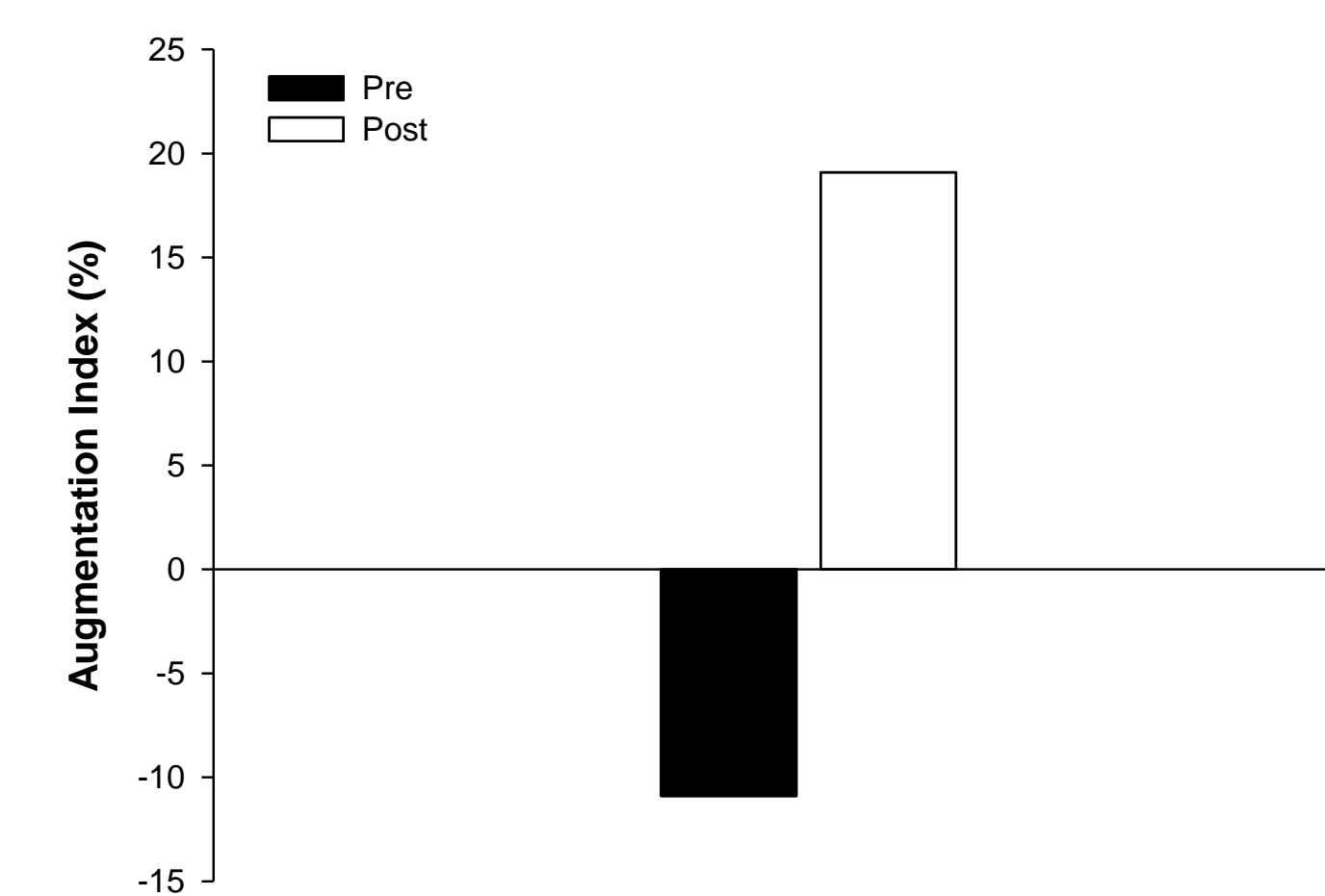
## RESULTS

**Table 1.** Participant characteristics and vascular function parameters pre- and post-beetroot juice intake.

	Pre	Post	$\Delta$
Age, y	73	73	0
Height, cm	165.75	165.75	0
Mass, kg	71.1	71.1	0
BMI, $\text{kg}/\text{m}^2$	25.2	25.2	0
Body fat, %	39.75	39.75	0
R grip strength	13	13	0
L grip strength	41	41	0
Heart rate, bpm	75	75.5	0.5
Peripheral pulse pressure, mmHg	54	49.5	-4.5
Central pulse pressure, mmHg	51	37	-14
Augmented pressure, mmHg	11.5	6.5	-5

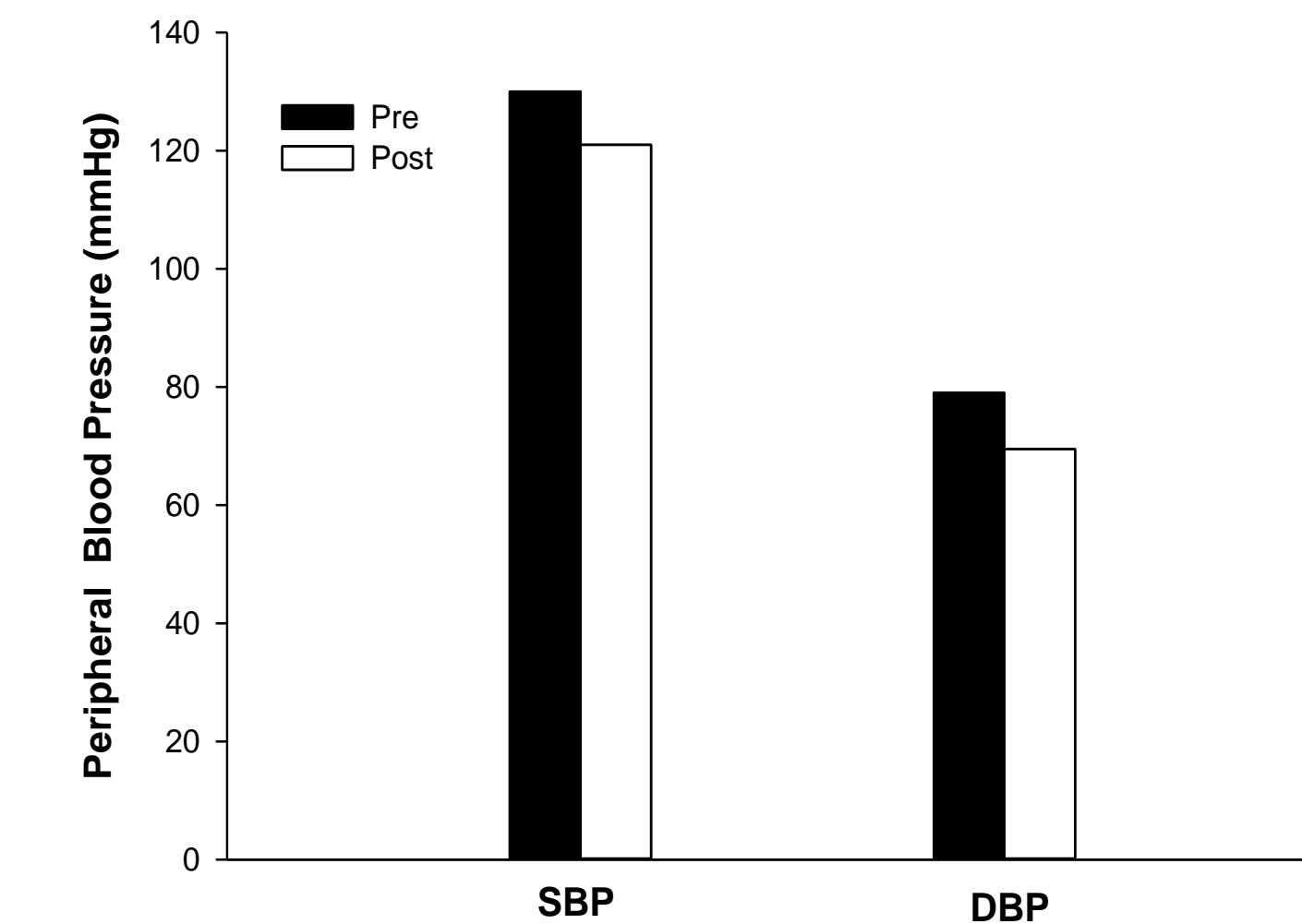


**Figure 1.** Carotid-to-radial pulse wave velocity (m/s) pre- and post-beetroot juice intake

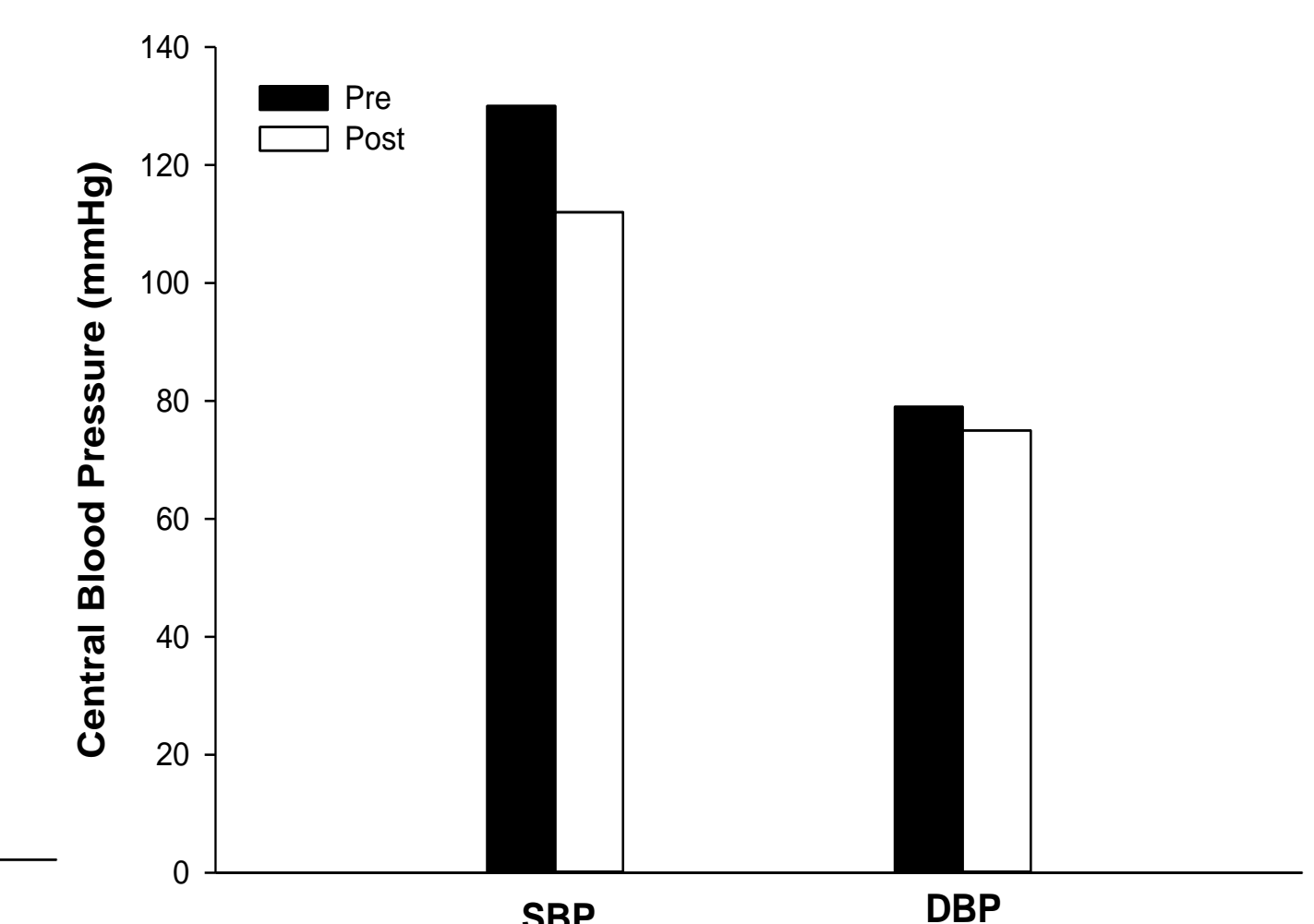


**Figure 2.** Augmentation index (%) pre- and post-beetroot juice intake

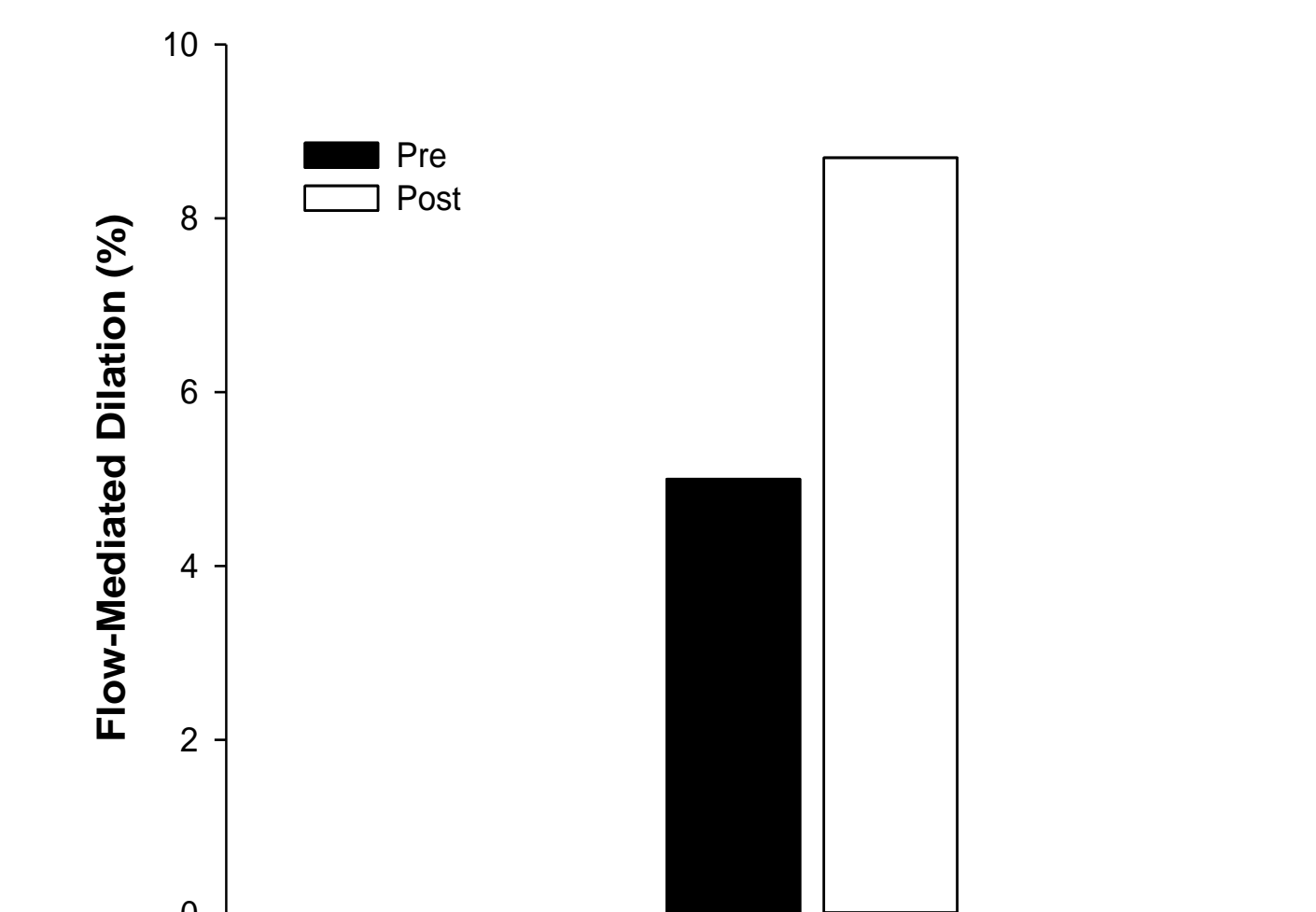
## RESULTS



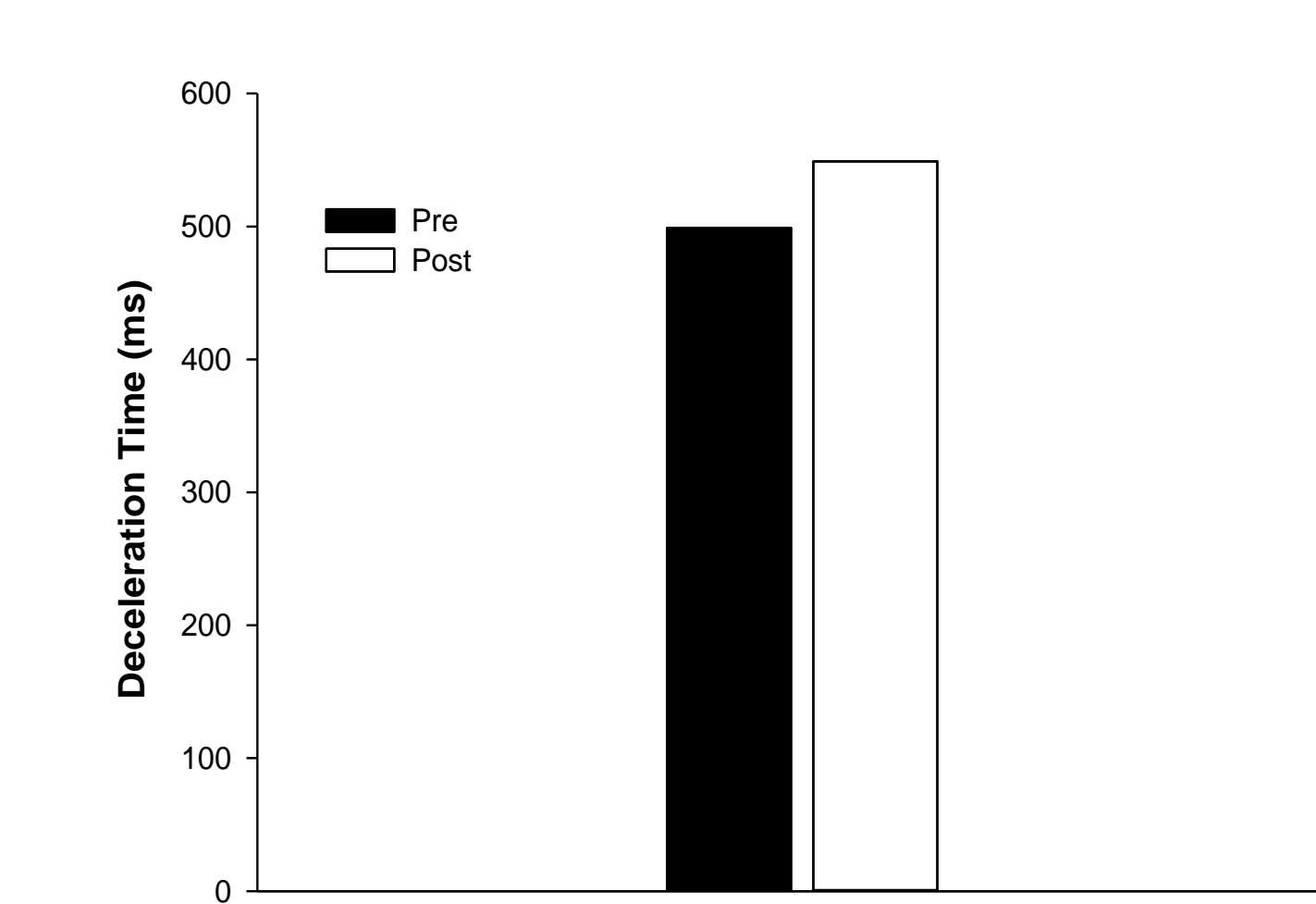
**Figure 3.** Peripheral blood pressure (mmHg) pre- and post-beetroot juice intake



**Figure 4.** Central blood pressure (mmHg) pre- and post-beetroot juice intake



**Figure 5.** Flow-mediated dilation (%) pre- and post-beetroot juice intake



**Figure 6.** Deceleration time (ms) pre- and post-beetroot juice intake

## CONCLUSIONS

- Our preliminary findings suggest that acute intake of a  $\text{NO}_3^-$  supplement normalized to body mass may potentially be a useful therapeutic treatment to improve endothelial function and both central and peripheral vascular function.
- However, this is a pilot study and investigation with a larger sample size is warranted.

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