

## Acute Flavanol Supplementation Improves the Attenuated Cerebral Vasodilatory Capacity in Young African Americans

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### ABSTRACT

African Americans (AA) have increased risk for cerebral vascular disease including stroke, Alzheimer's disease, or dementia relative to Caucasian Americans (CA). Our recent study found that AA have attenuated cerebral vasodilatory response to rebreathing-induced hypercapnia when compared with CA. Thus, we hypothesized that acute flavanol intake restores blunted cerebral responses in AA. Fourteen healthy college-aged AA and 14 age- and sex-matched CA participants were studied. A four-parameter logistic regression was used for curve fitting the responses of cerebral vascular conductance (%CVCi) relative to changes in end-tidal carbon dioxide concentration. In AA, there were significant improvements in total range of changes in %CVCi ( $a$ ) and the maximum increase in %CVCi ( $y_0$ ) with flavanol beverage ( $a$ ; pre:  $46.4 \pm 16$  vs. post:  $64.4 \pm 19$  %CVCi;  $P = 0.007$ ,  $y_0$ ; pre:  $151.1 \pm 18$  vs. post:  $166.0 \pm 22$  %CVCi;  $P = 0.002$ ); however, there were no differences in  $a$  and  $y_0$  with placebo ( $a$ ; pre:  $52.5 \pm 19$  vs. post:  $51.7 \pm 17$  %CVCi;  $P = 0.35$ ,  $y_0$ ; pre:  $156.2 \pm 20$  vs. post:  $151.3 \pm 17$  %CVCi;  $P = 0.26$ ). In CA, no differences in  $a$  and  $y_0$  with flavanol ( $a$ ; pre:  $73.7 \pm 18$  vs. post:  $71.7 \pm 22$  %CVCi;  $P = 0.70$ ,  $y_0$ ; pre:  $175.7 \pm 20$  %CVCi vs. post:  $175.6 \pm 22$  %CVCi;  $P = 0.99$ ) or placebo ( $a$ ; pre:  $75.7 \pm 15$  vs. post:  $80.1 \pm 20$  %CVCi;  $P = 0.24$ ,  $y_0$ ; pre:  $177.4 \pm 21$  %CVCi vs. post:  $180.6 \pm 25$  %CVCi;  $P = 0.45$ ) were observed. In conclusion, acute flavanol supplementation increases the total range of changes in cerebral vascular conductance as well as maximum vascular conductance in AA, effectively abolishing the ethnic-related difference in cerebral vasodilatory capacity in response to rebreathing-induced hypercapnia.