# Taste preferences and blood pressure response to stress: a pilot study

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The physiological response to stress involves stimulation of the hypothalamic-pituitary-adrenal axis and the sympathetic nervous system, together with increases in blood pressure and heart rate. Increases in appetite for sweet foods and higher salt intakes have been reported in laboratory animals subjected to stress (1) (2). This pilot study was undertaken to examine blood pressure response and taste preferences for salt and sucrose solutions in human volunteers subjected to a standardised arithmetic stress test.

Twenty subjects were recruited from staff and students at Deakin University. Height and weight were measured and then subjects were asked to rest in the sitting position for five minutes. An ambulatory blood pressure monitor (TM-2421, A&D, Japan) automatically measured blood pressure every two minutes. Baseline blood pressure was assessed over 13 minutes following the rest period. Subjects then underwent a standardised arithmetic stress test for six minutes, which consisted of serial subtractions of seven starting from the number 9000, with subjects aiming to complete a set number of subtractions per minute. Twelve minutes after the conclusion of the stress test, the post stress (PS) period, subjects were asked to indicate their preference for both tomato juice with a range of salt concentrations (0, 0.1, 0.2, 0.3 and 0.5%) and water with a range of sucrose concentrations (4.5, 6.0, 7.5, 9.0 and 11.0%). Solutions were presented in random order. Within one week of completing the stress test, the subjects repeated the taste test at home when they were non-stressed (NS).

Seventeen subjects, 14 females and three males, completed the stress test, and the taste test in the PS and NS states. Subjects had a mean age of 39(12) (SD) years and a mean BMI of 24(3) kg/m$^2$. Systolic and diastolic blood pressures, and pulse rate were all significantly greater at the end of the stress test when compared to baseline (see table). Systolic and diastolic blood pressures were still elevated ten minutes after the stress test when compared to baseline levels. The mean concentration preferred by subjects for the salt solution PS was 0.22 ± 0.03 (SEM) % and 0.19 ± 0.04% when they were NS, and tended to be lower for the sucrose solution PS when compared to the NS state, 6.03 ± 0.52% and 7.24 ± 0.69% respectively, (P = 0.056).

There was no difference in the mean concentrations preferred by subjects for both the salt and sucrose solutions in the PS and NS states.

| | Baseline period (13 minutes)[1] | Stress test (6 minutes)[1] | Post stress test period (10 minutes)[1] |
|---|---|---|---|
| Systolic (mmHg) | 117 ± 2 | 131 ± 4* | 122 ± 2* |
| Diastolic (mmHg) | 74 ± 2 | 82 ± 3* | 77 ± 2* |
| Pulse (bpm) | 67 ± 2 | 78 ± 3* | 66 ± 2 |

[1]mean ± SEM; *P<0.05, compared to baseline.

**References**

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