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The effect of weight loss on blood pressure response to acute mental stress

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Background - Blood pressure (BP) responses to stress have been associated with the development of hypertension.

Objective - To assess the effect of weight loss on BP responses to stress.

Design - Sixty-four men completed a baseline mental stress test (13 minutes resting, 7 minutes stress, 36 minutes recovery) and then either participated in a 12 week weight loss program incorporating diet and exercise (intervention group, n=33) or maintained weight (control group, n=31). Both groups underwent a final stress test after 10-12 weeks.

Outcomes - Fifty-five men completed the study (intervention (n=28), controls (n=27)]. At baseline there were no differences between the groups in mean ± SEM age (48.7 ± 1.7 versus 49.9 ± 2.1 years), Body Mass Index (30.0 ± 0.4 versus 28.8 ± 0.6 kg/m²) or resting BP (126.8 ± 1.5/83.0 ± 1.0 versus 125.4 ± 1.4/84.3 ± 1.5 mmHg). Weight fell by 4.3 ± 0.5 (mean ± SEM) kg (P <0.05) in the intervention group and was unchanged in the controls (+0.4 ± 0.3 kg). The intervention group had a greater fall in resting systolic BP (SBP) and diastolic BP (DBP) following weight loss when compared to controls (mean between group difference of change: SBP: -4.6 ± 1.8 mmHg, P <0.05; DBP: -3.2 ± 1.6 mmHg, P =0.05). Following weight loss, there were no differences in the stress induced change (stress minus resting values) in SBP, DBP and pulse rate between the groups. After weight loss, the intervention group returned to resting SBP levels in less time than the controls (15.2 ± 1.8 versus 20.9 ± 1.9 minutes, P<0.05) and SBP was significantly lower in the first 24 minutes post stress (P <0.05).

Conclusion - A 5% loss of weight can lead to a general reduction in BP during mental stress and importantly assists to reduce the length of time that SBP remains elevated after a stressful event. These favorable reductions in BP responses to stress are likely to reduce the time that BP is raised during the day and potentially improve cardiovascular risk, as impaired post-stress recovery has been found to predict longitudinal increases in blood pressure in middle-aged men and women.¹

References