Weight-loss and sodium-reduction programmes reduced BP and the risk for hypertension in overweight adults with high-normal BP

The Trials of Hypertension Prevention Collaborative Research Group. **Effects of weight loss and sodium reduction intervention on blood pressure and hypertension incidence in overweight people with high-normal blood pressure. The Trials of Hypertension Prevention, phase II.** Arch Intern Med. 1997 Mar 24;157:657-67.

Objective
To determine the efficacy of programmes for weight loss, dietary sodium reduction, or both, for lowering diastolic and systolic blood pressure (BP) and for decreasing the incidence of hypertension in persons who are moderately overweight and have high-normal BP.

Design
Randomised controlled trial of 3 to 4 years of duration (Trials of Hypertension Prevention [TOHP]).

Setting
9 medical centres in the United States.

Patients
2382 adults (mean age 44 y, 66% men, 79% white) with high-normal BP and who were moderately overweight and between 30 and 54 years of age. Exclusion criteria were hypertension, medication that affects BP, cardiovascular disease, diabetes, renal insufficiency, serious illness, or current or planned pregnancy. Follow-up was > 89%.

Intervention
Active intervention groups included individual sessions with a counselor and support-group sessions. 595 participants were in the weight-loss group (ideal weight or loss of ≥ 4.5 kg), 594 were in the reduced-sodium dietary group (≤ 80 mmol/d), 597 were in the combined intervention group (same weight-loss goal and ≤ 70 mmol/d of sodium), and 596 received usual care.

Main outcome measures
Changes in weight, diastolic and systolic BP, and sodium excretion, and incidence of hypertension.

Main results
Results are reported as comparisons with the usual-care group. Results were as expected with weight loss in the weight-loss groups and reduced sodium in the sodium-reduction group. Reductions in BP were more pronounced for systolic BP than for diastolic BP.

Conclusion
In overweight adults with high-normal BP, weight-loss and reduced-sodium programmes were effective, at least in the short term, in reducing weight, BP, sodium excretion, and the risk for developing hypertension.

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Usual care vs programmes for weight loss, sodium reduction, or both*

Outcome at 36 months	Weight-loss group	Reduced-sodium group	Combined intervention group
Weight loss	−1.9 kg ($P < 0.001$)	NS	−2.1 kg ($P < 0.001$)
Diastolic BP	−0.9 mm Hg ($P = 0.04$)	NS	NS
Systolic BP	−1.3 mm Hg ($P = 0.01$)	−1.2 mm Hg ($P = 0.02$)	−1.1 mm Hg ($P = 0.05$)
Development of hypertension	RR = 0.81 ($P = 0.009$)	RR = 0.88 ($P = 0.09$)	RR = 0.84 ($P = 0.02$)

*BP = blood pressure; NS = not significant; RR = relative risk.

Commentary

Lifestyle modifications, including weight reduction and reduced dietary sodium, are accepted treatments for hypertension. Even when not adequate for controlling hypertension, weight and sodium reduction complement the use of antihypertensive medication and may result in lower doses of fewer medications. Clinical trial data indicate that each 100 mmol/d reduction in sodium intake lowers systolic BP by 6 mm Hg and diastolic BP by 3 mm Hg. Weight reduction has also been shown to lower BP: A 5-kg decrease in weight has been associated with reductions of between 5 to 9 mm Hg in systolic BP and 2 to 8 mm Hg in diastolic BP.

Because cardiovascular disease occurs in persons with high-normal BP, and antihypertensive treatment lowers but does not eliminate the risks associated with hypertension, population and targeted strategies for primary hypertension prevention have been proposed. The TOHP is 1 of several important primary hypertension prevention trials (1, 2). This report of phase II of TOHP showed that reduced-sodium and weight-reduction interventions result in small, long-term BP decreases. Initial greater BP reductions decreased over time as participants regained weight and resumed previous dietary habits. It is important to note that these interventions resulted in a 6% absolute risk reduction for hypertension (1 incident case was prevented for every 17 patients treated).

Based on observational and clinical studies, public health recommendations to maintain ideal body weight and limit dietary sodium to < 6 g/d seem safe and reasonable, particularly because small BP decreases may translate into population reductions in cardiovascular disease. Although counseling about lifestyle modification is warranted for patients who are at risk, population strategies may prove to be a more cost-effective approach.

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References

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