

Lifestyle recommendations reduced blood pressure in patients with above-optimal blood pressure

Appel LJ, Champagne CM, Harsha DW, Cooper LS, Obarzanek E. **Effects of comprehensive lifestyle modification on blood pressure control: main results of the PREMIER clinical trial.** JAMA. 2003;289:2083-93.

QUESTION

In persons with above-optimal blood pressure (BP), what is the relative effectiveness of 2 behavioral interventions (established lifestyle recommendations [ELR] and ELR plus the Dietary Approaches to Stop Hypertension [DASH] diet) compared with advice only?

DESIGN

Randomized (allocation concealed*), blinded (data collectors),* controlled trial with 6-month follow-up (PREMIER Clinical Trial).

SETTING

4 clinical centers in Baltimore, Maryland; Baton Rouge, Louisiana; Durham, North Carolina; and Portland, Oregon, USA.

PATIENTS

810 generally healthy adults who were ≥ 25 years of age (mean age 50 y, 62% women), had above-optimal BP (mean systolic BP 120 to 159 mm Hg and diastolic BP 80 to 95 mm Hg during 3 screening visits), were not taking antihypertensive medication, and had a body mass index of 18.5 to 45.0. Exclusion criteria were regular use of drugs affecting BP; target organ damage or diabetes; use of weight-loss medication; previous cardiovascular event; congestive heart failure; angina; cancer diagnosis or treatment in the previous 2 years; consumption of > 21 alcoholic

drinks/wk; and pregnancy, planned pregnancy, or lactation. 87% of patients completed all 3 follow-up visits at 6 months.

INTERVENTION

268 patients were allocated to the ELR group (weight loss for overweight participants, reduced sodium intake, increased physical activity, and limited alcohol intake). 269 patients were allocated to the ELR-plus-DASH-diet group (reduced fat and cholesterol; increased potassium, calcium, magnesium, protein, and fiber). Patients in both of these groups had 14 group meetings and 4 individual counseling sessions during the initial 6 months. 273 patients were allocated to the advice group (a single 30-min individual session, delivered by a dietitian).

MAIN OUTCOME MEASURES

Change in systolic BP from baseline to 6 months. Secondary outcomes included change in diastolic BP.

MAIN RESULTS

Analysis was by intention to treat. Patients in the ELR and ELR-plus-DASH groups had greater reductions in systolic and diastolic BP than did patients in the advice group (Table); the 2 behavioral intervention groups did not differ (Table).

CONCLUSION

Patients with above-optimal blood pressure (BP) who received established lifestyle recommendations, with or without the Dietary Approaches to Stop Hypertension diet, had greater reductions in BP than did those who received advice only.

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*See Glossary.

Established lifestyle recommendations (ELR) or ELR plus Dietary Approaches to Stop Hypertension (DASH) diet vs advice only for above-optimal blood pressure (BP)†

| Outcomes | Mean between-group differences in BP change (95% CI) | | |
|----------------------|--|----------------------|---------------------|
| | ELR vs advice | ELR + DASH vs advice | ELR + DASH vs ELR |
| Systolic BP (mm Hg) | -3.7 (-5.3 to -2.1) | -4.3 (-5.9 to -2.8) | -0.6 (-2.2 to 0.9)‡ |
| Diastolic BP (mm Hg) | -1.7 (-2.8 to -0.6) | -2.6 (-3.7 to -1.5) | -0.9 (-2.0 to 0.2)‡ |

†CI defined in Glossary.
‡Not significant.

COMMENTARY

The PREMIER study shows that lifestyle interventions can have clinically important effects on BP and progression to overt hypertension. Previous work focused on weight loss and dietary sodium reduction (1). The DASH diet expanded these concepts to increase potassium consumption with fruits and vegetables and increase calcium intake with low-fat dairy products (2). A key issue has been whether addition of the DASH diet to standard recommendations would result in improved BP. The behavioral lifestyle intervention was intensive, and this translated into weight reduction (on average 5 kg) and reduction in urinary sodium excretion. The resultant drops in BP were relatively small in absolute magnitude, but intervention patients were more likely to have optimal BP at 6 months. The nonsignificant differences between the ELR and the ELR-plus-DASH groups suggest that clinicians should focus on promoting weight loss through exercise and caloric restriction including dietary sodium reduction.

We now have strong evidence in hypertension and in diabetes prevention (3) that lifestyle interventions are possible and can clearly benefit patients. The challenge will be to effectively implement these

findings in clinical practice with a full spectrum of patients. Clinicians can recommend these lifestyle changes but should be realistic and expect that only a select group of self-motivated patients may adopt them. Public health officials should take heed of the results of this trial and devise creative and cost-effective ways to implement them broadly.

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