

# Review: restricted dietary salt intake can reduce blood pressure but does not reduce death or cardiovascular morbidity

Hooper L, Bartlett C, Davey Smith G, et al. *Reduced dietary salt for prevention of cardiovascular disease. Cochrane Database Syst Rev* 2003;(1):CD003656 (latest version 26 Feb 2003).

**QUESTION:** In people with normal and elevated blood pressure (BP), does a reduction in dietary salt decrease blood pressure, death, or cardiovascular events?

## Data sources

Studies were identified by searching the *Cochrane Library*, Medline, and EMBASE/Excerpta Medica; reviewing bibliographies or relevant studies; and contacting authors.

## Study selection

2 reviewers independently selected randomised controlled trials (RCTs) that compared interventions designed to reduce salt intake with placebo or no active intervention in adults ( $\geq 16$  y) with normal or high BP. Institutionalised, acutely ill, or pregnant people were excluded.

## Data extraction

2 reviewers independently assessed the quality of RCTs (randomisation method, allocation concealment, blinding, and losses to follow up) and extracted data on patient characteristics, interventions and type of controls, and outcomes (including mortality, cardiovascular events, dropouts, and BP levels).

## Main results

11 RCTs met the selection criteria. 3 RCTs included normotensive participants (2326 participants, mean age 40 y), 5 RCTs included untreated hypertensive participants (387 participants, 16–64 y of age), and 3 RCTs included treated hypertensive participants (801 participants, 55–67 y of age). Follow up ranged from 6 months to 7 years. Dietary salt restriction reduced systolic and diastolic BP at 6–12 months (7 RCTs) and systolic BP at 13–60 months (4 RCTs). Groups did not differ in the number of dropouts, mortality, cardiovascular morbidity, diastolic BP at 13–60 months (table), or BP at  $> 60$  months.

## Conclusions

In people with normal or high blood pressure, dietary salt restriction reduces blood pressure at 6–12 months. In the few trials reporting on mortality and cardiovascular morbidity, no difference was seen.

## COMMENTARY

The small reduction in BP with salt restriction reported in the review by Hooper *et al* is unimpressive. It is interesting, however, that some patients were able to stop their antihypertensive medication and use salt restriction as an alternative, without any deterioration in their BP control. The fact that this review could show no benefit in cardiovascular events is not surprising as there were only 17 deaths in the whole review and they were equally distributed between intervention and control groups.

The average sodium intake in developed countries is about 150 mmol/day. Most dietary sodium comes from processed food (eg, bread, cheese). The average Yanomamo Indian from the Brazilian forest has an intake of just 1 mmol/day and an average adult BP of 96/61 mm Hg.<sup>1</sup> Such low levels of intake are not realistic in developed countries, and intakes of no higher than 50–100 mmol/day are recommended to reduce BP. Sodium restriction is not popular and should only be recommended to the few who are determined to stay off medication or at least stay on the lowest dose possible. They will need to make their own bread or find a supply of low or no sodium bread. It will take them about 6 weeks to adapt to the taste in their food.

Patients may be more interested in increasing their aerobic physical activity, which can result in reductions of BP of about 4 mm Hg systolic and 3 mm Hg diastolic, or losing weight with a 2–4 kg weight loss resulting in a 1 mm Hg reduction in systolic BP. Others may prefer to reduce their alcohol intake because each drink reduction per day results in systolic and diastolic reductions of about 1 mm Hg.

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- 1 Mancilha-Carvalho JJ, de Oliveira R, Esposito RJ. Blood pressure and electrolyte excretion in the Yanomamo Indians, an isolated population. *J Hum Hypertens* 1989;3:309–14.

*Dietary salt restriction v control for normal or high blood pressure\**

Outcomes	Number of RCTs	Weighted mean difference (95% CI)			
Systolic BP (mm Hg) at 6–12 months	7	-2.5 (-3.8 to -1.2)			
Diastolic BP (mm Hg) at 6–12 months	7	-1.2 (-1.8 to -0.7)			
Systolic BP (mm Hg) at 13–60 months	4	-1.1 (-1.8 to -0.4)			
Diastolic BP (mm Hg) at 13–60 months	4	-0.6 (-1.5 to 0.3)†			
		Weighted event rates	RRR (95% CI)	NNT	
Total mortality	3	0.69%	0.73%	10% (-124 to 36)	Not significant
Cardiovascular morbidity	2	11%	14%	18% (-21 to 41)	Not significant
			RRR (CI)	NNH	
Dropouts	9	12%	11%	4% (-14 to 25)	Not significant

\*BP = blood pressure; RCTs = randomised controlled trials. Other abbreviations defined in glossary; weighted event rates, RRR, RRI, NNT, NNH, and CI calculated from data in article.

†Not significant.

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