

Dietary counseling to reduce moderate sodium intake. Concerns about the methods, evidence and feasibility of lowering sodium intake

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Smyth et al. performed a 2-year randomized controlled trial (RCT) examining the impact of 6.5 h of dietary advice to reduce sodium intake on blood pressure and biological markers of cardiovascular (CVD) and renal disease.¹ However, there are concerns about their methods for assessing urinary sodium and some statements regarding the feasibility of reducing dietary sodium and the evidence supporting sodium reduction.

The criteria used by Smyth et al. (at least 50% predicted creatinine excretion) to assess completeness of the 24 h urine collections is unusual and would have included a large number of incomplete collections as complete (e.g., creatinine excretion of at least 60–69% of expected is only 8–49% sensitive to detect incomplete 24 h urine collections compared to the standard of PABA excretion²). We are unaware of any relevant validation study using 24 h urine creatinine within 50% of predicted. The method used to assess completeness of 24 h urines can have a more than 2-fold impact on reported sodium excretion.³ To allow interpretation of sodium excretion data, Smyth et al. should use a standard method (e.g., creatinine excretion index <0.7 is the most sensitive for removing incomplete collections) and report the rates of incomplete 24 h urines at each time point where they report 24 h urine sodium excretion.²

Smyth et al., do not provide adequate context when stating that “observational studies report conflicting findings on the association of low sodium intake with CVD and mortality, with some studies reporting a higher risk at low intake (<3 g/day) compared to moderate intake”, and that a recent large RCT in patients with heart failure did not report a lower risk of mortality of CVD with low sodium intake.¹ Smyth et al., also state long term dietary advice studies are ineffective at reducing sodium below 3000 mg/day which contrasts with major trials of dietary advice that lowered sodium intake to less than 3000 mg/day.^{1,4}

A meta-analysis of RCTs based on dietary advice had an average reduction in sodium intake from 3646 to

2690 mg/day with a 26% reduction in CVD and a linear association of CVD with sodium intake down to 2300 mg/day.⁴ Thus, dietary advice is feasible to lower dietary sodium below 3000 mg/day and reduces CVD. Furthermore, an analysis of cohort studies that used the recommended multiple 24 h urine collections found a linear association of sodium intake from 1846 to 5230 mg/day with CVD.⁴ The National Academies of Science, Engineering and Medicine and 75 national and international nongovernmental organizations have stated that low quality research, such as the cohort studies Smyth et al. cited as showing higher CVD with lower sodium intake, are a driver of the controversy regarding the health benefits of reducing dietary sodium and that nongovernmental organizations have also expressed concern that misinformation about dietary sodium is also a driver of controversy.^{1,4–6} The change in dietary sodium in the large RCT in heart failure, based on dietary advice, that Smyth et al. cited, reduced dietary sodium from 2286 to 1658 mg/day, far lower than Smyth et al. claim is not feasible and the reduction was associated with an improvement in quality of life and NYHA functional class of heart failure (although mortality was not significantly changed).⁷

The study by Smyth et al. shows that in the current food environment, it is difficult for individuals to sustain lower sodium intake long-term. Thus, upstream interventions, (e.g., mandatory sodium targets for processed foods), are urgently needed and strongly recommended to improve the food system to reduce sodium intake.

Contributors

NRCC wrote the draft which was reviewed and revised by FJH and GAM. All authors accept responsibility for the publication.

Declaration of interests

NRCC reports personal fees from Resolve to Save Lives (RTSL), the Pan American Health Organization, and the World Bank, outside the submitted work; and is an unpaid member of World Action on Salt, Sugar and Health and an unpaid consultant on dietary sodium and hypertension control to numerous governmental and non-governmental



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organizations. Dr Campbell chaired the International Consortium for Quality Research on Dietary Sodium/Salt (TRUE) which is an unpaid voluntary position. Dr Campbell was on the Medical Advisory Board of Switch Health (2022–2023) and was a one-time reviewer of a joint Novartis Canada Alberta Health Services collaborative project to treat dyslipidemia. All the honoraria from Switch Health and Novartis Canada have been donated to the University of Calgary to support a community cardiovascular disease prevention recognition award. FJH is an unpaid member of Action on Salt, and World Action on Salt, Sugar and Health (WASSH). GAM is the unpaid Chair of Action on Salt, Action on Sugar, WASSH, and Blood Pressure UK.

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