Universal Salt Reduction

To the Editor:

Egan, in his editorial of the re-analysis of the DASH-sodium data, appears to endorse universal salt reduction in the entire population, which has, according to him, a substantial foundation. However, in the last paragraph, he seems to pour cold water on this conclusion and one is left uncertain as to what he is saying.

The results of the re-analysis of the DASH-sodium study support the large body of other evidence that salt reduction should be directed at the entire population rather than “susceptible individuals.” Much of this evidence Egan does not mention. A recent expert committee in the United Kingdom re-examined all of the evidence on salt and concluded that, since the early 1990s, the evidence has increased and recommended a reduction in all adults to 6 g/d or less and much larger reductions in children dependent on age.

Egan, in previous publications, has studied the acute effects of large salt reductions. It is bizarre, therefore, that he quotes Graudal’s meta-analysis as the only evidence against population salt reduction. Graudal’s meta-analysis included very short-term (eg, 5 days) and large changes in salt intake (eg, from 20 to <1 g/d). The average duration was only 8 days in normotensives. To draw any conclusions about the long-term effects of modest salt reductions from Graudal’s meta-analysis is misjudgment. Would blood pressure (BP)-lowering drugs be assessed on their action for only 5 days?

We recently published a meta-analysis of the studies of 1 month or more of salt reduction and demonstrated significant reductions in BP in both normotensives and hypertensives and, in both, there was a dose response. For a 3 or 6 g/d reduction in salt intake there would be major public health benefits.

From a public health perspective, reducing salt intake is one of the easiest strategies to carry out in that, both in the United States and Europe, ~80% of salt consumed is hidden in processed, canteen, restaurant, and fast food. A strategy of small reductions (10% to 20%), which are not detected by the human salt taste receptors, across all foods where salt has been added, repeated at 1 to 2 yearly intervals, would mean that within 5 years salt intake would be reduced to the target without the consumers’ knowledge, although this would be helpful if they did not add salt at the table or in their cooking (only ~10% to 15%).

The evidence for universal salt reduction is strong when compared with other dietary constituents eg, saturated fat, fruit and vegetables, although we would agree that action should also be taken about these, but unlike salt, this will require major changes in eating habits. The re-analysis of the DASH-Sodium Study reinforces the large amount of existing evidence that population salt intake should be reduced by gradual and sustained reductions in the salt content of all foods that have salt added. The public health benefit will be very large, eg, in the UK 35 000 deaths/year from stroke and ischemic heart disease would be prevented and much larger numbers would result in the United States if they follow the example of the UK.

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Response

The previous commentary produced unintended confusion for He and MacGregor. In an attempt to clarify, the DASH eating plan, which contains 2400 mg Na (≈100 mmol), has a high level of K+, Mg2+ and Ca2+, fruits, vegetables, and whole grains that are associated with positive health outcomes. DASH is consonant with American Heart Association guidelines for Na+, total fat, and saturated fat. Many clinical epidemiology and clinical trials confirm the benefits of this balanced nutritional program. This author supports universal implementation of the DASH eating plan with 2400 mg Na+.

The DASH eating plan containing 1500 mg of Na+ (≈60 mmol) is appropriate for many hypertensives and those at high risk for hypertension. Given heterogeneous BP responses to Na+ restriction and potential risk to those with excessive Na+ losses, I do not support universal implementation of the DASH 1500 mg Na+ diet.

In the DASH-Sodium Study, reducing Na+ to 100 mmol/d in a “normal” diet had a modest BP effect in volunteers (disproportionately black, middle-aged individuals with high normal BP) that are more salt sensitive than the general normotensive population. Moreover, the 2400 mg Na+ usual diet was associated with higher BP than the 2400 mg Na+ DASH. The review of longer-term studies by He and MacGregor found the net effect of reducing Na+ 74 mmol/d in normotensives was −2/−1 mm Hg. The Intersalt study reported the mean urinary Na+ in the United States was ≈130 mmol/ (≈3200 mg/d), which approximates daily intake. Reducing this amount by 74 mmol/d leads to Na+ intake of ≈56 mmol/d (≈1400 mg), well below the proposed goal of 2400 mg/d (≈100 mmol). Moreover, in studies with a double-blind design, the beneficial impact of salt restriction on BP is driven largely by 4 trials in which the mean age was >60 years. In 2 trials with a double-blind design in individuals averaging <30 years, which is closer to the median age of the US population, the mean effect on BP is −1/−1 mm Hg. The DASH-Sodium Study does not provide additional compelling support for universal Na+ restriction to 2400 mg/d as an isolated intervention.

The ecological studies do not provide compelling support for universal Na+ restriction given nutritional, anthropometric, ethnic, and cultural differences between populations. For example, a Nepalese community with Na+ intake of ≈200 mmol/d has a low prevalence of hypertension (≈1.4%) and little increase of BP with age. This group shares traits with other unacculturated, low-sodium societies in Intersalt including low body mass index, limited intake of fat and processed foods, and high levels of physical activity. Including this group in ecological studies

Letters to the Editor

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might alter conclusions about sodium’s effect on BP in normotensives.6

There should be no disagreement on the principle of public health strategies to prevent hypertension.1,2,5,6 This objective merits studies on Na⁺ restriction in a representative normotensive population to generate long-term safety and efficacy data. Until that information is available, I endorse the landmark DASH Study4 and support universal application of the DASH Eating Plan3 with 2400 mg Na⁺ daily.1

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