The great salt debate: too much or too little?

Too much salt is undoubtedly bad for you, but too little may also not be good, according to new research. Prof Eoin O’Brien of the UCD Conway Institute of Biomolecular and Biomedical Research examines the latest evidence in the controversy.

Salt intake

We eat too much salt to food and there is too much of it in most processed foods, which is a major source of dietary salt. The average daily salt intake in Ireland is high — approximately 10g per day in adults, with higher cardiovascular risk in which, moreover, raised salt intake was not reflected in an improved outcome. The study was dismissed as contributing to establish a safe range for dietary salt intake. They were careful to emphasise that their results did not negate the blood pressure-lowering effects of dietary salt reduction in hypertensive patients.

The study was dismissed by the Lancet as contributing to “little to our understanding of salt and disease” and that “bare results of this work should neither change thinking nor practice” (Lancet, Vol 377, Issue 9778, doi:10.1016/S0140-6736(09)62056-0). The grounds for such stringent criticism were based mainly on the fact that important issues “cannot be answered by small observational studies” and that “it is dangerous to jump to conclusions on the basis of single studies and ignore the totality of evidence”.

Then, as often happens in science, the refutation to this intolerant dismissal of scientific evidence came with another publication in JAMA: in November 2011, from the Population Health Research Institute at McMaster University in Canada with a Galway based scientist, Prof Martin O’Donnell, as the lead author (JAMA 2011;306:2289). In this study of 30,000 patients, the association of salt with cardiovascular outcome confirmed that too much salt is associated with increased risk from cardiovascular disease, but in keeping with Staessen’s earlier findings the study also showed that a low sodium intake was associated with increased risk.

Based on their findings the authors stressed the need to establish a safe range for sodium intake by performing randomised controlled trials.

The PURE Study

And so the matter rested, that this figure is produced by the year 2035, and that hypertension accounts for more than nine million deaths annually. We should be compelled, therefore, to examine carefully any interventions, such as salt restriction, that can reverse these apocalyptic statistics.

O’Donnell then goes on to point out in the Lancet that “the Centers for Disease Control and Prevention asked the Institute of Medicine (IOM) to convene an expert committee to evaluate the evidence for a relation between sodium intake and health outcomes.”

The committee concluded that most evidence supports a population reduction in high sodium intake and risk of cardiovascular disease but that there was inconclusive evidence to show if a low sodium intake (2.5g per day or 1.5g per day, as recommended in many dietary guidelines) was associated with an increased or reduced risk of cardiovascular disease in the general population. However, the committee warned that there was limited evidence that low salt intake might indeed be associated with adverse health effects in some subgroups, such as patients with heart failure or other forms of cardiovascular disease, diabetes, or chronic kidney disease.

The PURE study, which draws evidence from more than 100,000 adults sampled in 18 countries, now supports the caveat from the IOM by casting serious doubt on the assumption in the current guidelines that there is no unsafe lower limit of sodium intake.

We might well ask what adverse effects could result when the renin-angiotensin-aldosterone system, which is active in those with high sodium intake falls below about 3g per day? Moreover, a very small proportion of the population of the entire world population consumes a low-sodium diet and sodium intake is not related to blood pressure in these persons. If the pure intervention is to be performed, then inquiring into the question, therefore, the feasibility and usefulness of reducing dietary sodium as a population-based strategy for lowering blood pressure.

The PURE study also raises the possibility that potassium could play an important role as sodium. There is evidence that subjects with the New England Journal of Medicine, arguably medicine’s premier journal, have called for new evidence to cast further doubt on the wisdom of universal salt reduction (N Engl J Med 2014;370(14):1305-1314; doi: 10.1056/NEJMoai1311889 and 372:677-679).

The Lancet’s editorial by Dr Suzanne Oparil in the same journal begins by reminding us that “hypertension is the most common modifiable risk factor for cardiovascular disease and death. Worldwide, it is estimated that 1 billion adults have hypertension, that this figure is projected to climb to 1.5 billion by the year 2025, and that hypertension accounts for more than nine million deaths annually.” We should be compelled, therefore, to examine carefully any interventions, such as salt restriction, that can reverse these apocalyptic statistics.

O’Donnell concludes her editorial by stating that “these provocative findings beg for a randomised, controlled trial to compare reduced sodium intake with usual dietary salt” and that “in the absence of such a trial, the results argue against reduction of dietary sodium as an isolated public health recommendation”.

Conclusions

So what can we reasonably conclude from these interesting papers (with Prof O’Donnell once again lending authorship of some 28 world experts) published the result of the PURE study last month in the New England Journal of Medicine, arguably medicine’s premier journal, have called for new evidence to cast further doubt on the wisdom of universal salt reduction (N Engl J Med 2014;370(14):1305-1314; doi: 10.1056/NEJMoai1311889 and 372:677-679). The Lancet’s editorial by Dr Suzanne Oparil in the same journal begins by reminding us that “hypertension is the most common modifiable risk factor for cardiovascular disease and death. However, it is estimated that 1 billion adults have hypertension, which is projected to climb to 1.5 billion by the year 2025, and that hypertension accounts for more than nine million deaths annually.” We should be compelled, therefore, to examine carefully any interventions, such as salt restriction, that can reverse these apocalyptic statistics.

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