

# Commentary: the salt and hypertension issue today

## Summary

In spite of much evidence that sodium chloride (common salt) does not cause hypertension in Caucasians with normal renal function, low salt diets are still being recommended for the population. There is increasing concern about the harmful effects of the universal adoption of low salt diet by the normal population. Low salt diet may be an exacerbating factor in the increasingly common condition of hyponatraemia, particularly in the elderly, chronic sick and those with renal inability to retain sodium. Of particular concern is the possibility of brain damage, mental illness and the development of Alzheimer's disease. There is increased mortality amongst people taking low salt diets. As previously advocated,<sup>1</sup>, there should be a moratorium on population salt deprivation policies.

**Keywords:** sodium chloride, hypertension, mineral balance

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## Commentary

In 1981, the MRC Blood Pressure Unit in Glasgow disproved the "salt causes hypertension" theory by showing that, in patients developing hypertension, the total exchangeable sodium content of their bodies was normal.<sup>2</sup> Even earlier it was shown that loading excessive amount of salt into normal Caucasian people did not cause a rise in blood pressure.<sup>3</sup> The arguments in favour of the "salt causes hypertension theory" are based on statistical analyses of epidemiological data with all the potential causes of bias in such studies, and should not be used to set aside the clear cut science disproving the theory.<sup>2,3</sup>

The publication in 2011 the paper by Stolarz-Skrzypek et al.<sup>4</sup> showed that when an epidemiological study excludes all people but European Caucasians, there is no correlation between blood pressure and 24 urinary sodium output, which is the best index of salt consumption. As the previous studies examined people of mixed ethnic origin, sodium handling is different in some Afro-Caribbean people; there may have been enough of such contamination to produce a statistical significance, but the variance is huge and large numbers of people have to be screened to get a correlation, which means large numbers of people are not on the correlation line that fits the data best. So why apply the average with large variation to the whole population?

There is some evidence that physicians are beginning to heed our message.<sup>1</sup> Lelong et al.<sup>5</sup> considered their squared partial correlation coefficient, and found that age and BMI were the most important variables relating to systolic blood pressure (SBP) level. Salt intake was not associated with SBP in either sex after multiple adjustments. In 2016, American Heart Association News reported a study that suggested that reducing excessive salt benefits some people with high blood pressure, but low-sodium diets do not help people with lower risks for heart disease, stroke or death. A study published in the Lancet.<sup>6</sup> involved more than 130,000 people from 49 countries, concluded that low-salt diets in people with and without high blood pressure may actually increase the risk of cardiovascular disease and death compared to average salt consumption. Criticism of that study in the Lancet correspondence (Lancet 388, page 2111) only goes to show the persistence of the proponents of the low salt diet and the apparent power they have with governments. Governments of course are made up of politicians who like to win votes by promising measures to

improve the populations' health - hence government regulations for low salt diet and low fat diet diet that have caused much harm.

The conclusion that body mass index (BMI) was the main contributory modifiable factor of BP level after multiple adjustments.<sup>5</sup> raises more awareness of the real target for control of hypertension in the population - insulin resistance. Insulin resistance is characterised by the triad of obesity (high BMI), diabetes and hypertension. The reason for abandoning not only low salt diet for the population, but also abandoning low fat diets is that most people eating low fat diet are eating an excessive amount of carbohydrate, which puts them into a pre-diabetic state or even overt type 2 diabetes, often with associated hypertension.

## So what should be our public health recommendation in 2017?

Our recommendation for preventing normal people contracting disease has always been, "Do not give a normal person a drug with side effects". By the same token, we recommend, "Do not change a normal person's diet if it can cause harm". Salt restriction can cause harm. Sodium is the essential ion for nerve conduction, muscle activation and cell signalling. Some elderly people and pregnant women have an inability of the kidneys to retain sodium; hyponatraemia is an increasingly common problem in the elderly.<sup>7</sup> Low salt intake can lead to hyponatraemia,<sup>8</sup> swelling of the brain and consequent damage, possible associated with Alzheimer's amyloid plaque formation.<sup>9</sup> Low fat diet, as already mentioned is associated with the epidemic of diabetes and obesity and should be avoided, or even replaced by low carbohydrate diet. Patients worried about their health should get their kidney function measured (renal disease can cause hypertension and is associated with cardiovascular disease) and, if renal function is normal, revert to average salt content in their diet and a reasonable amount of fat within a diet that has a match between calorie intake and energy output.

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## Conflicts of interest

There were no financial interest or conflict of interest.

## References

1. Drake-Holland AJ, Noble MIM. Should we now abandon the low-salt diet? Commentary: *Quarterly J Med*. 2011;104:1103–1106.
2. Lever AF, Beretta-Piccoli, C, Brown JJ, et al. Sodium and potassium in essential hypertension. *BMJ*. 1981;283:463–468.
3. Luft FC, Ramkin LI, Bloch R, et al. Cardiovascular and humoral responses to extremes of sodium intake in normal black and white men. *Circulation*. 1979;60(3):697–706.
4. Stolarz-Skrzypek K, Kuznetsova T, Thijs L, et al. Fatal and Nonfatal Outcomes, Incidence of Hypertension, and Blood Pressure Changes in Relation to Urinary Sodium Excretion. *JAMA*. 2011;305(17):1777–1785.
5. Lelong H, Galan P, Kesse-Guyot E, et al. Relationship between nutrition and blood pressure: Across-sectional analysis from the NutriNet-Sante' study, a French web-based cohort study. *Amer J Hypertens*. 2015;28(3):362–371.
6. Mente A, O'Donnell M, Rangarajan S, et al. Associations of urinary sodium excretion with cardiovascular events in individuals with and without hypertension: a pooled analysis of data from four studies. *Lancet*. 2016;388(10043):465–475.
7. Kugler JP, Hustead T. Hyponatremia and hypernatremia in the elderly. *Am Fam Physician*. 2000;61:3623–3630.
8. Hooper L, Bartlett C, Davey Smith G, et al. The long term effects of advice to cut down on salt in food on deaths, cardiovascular disease and blood pressure in adults. Cochrane Database of Systematic Reviews. Cochrane Library, 2004;PMID:14974027.
9. Marlow G. Could Hyponatremia Be the Root Cause of Alzheimer's? *Alzheimer Forum*; 2009.