

Food salts: the sodium and potassium story.

High salt (sodium chloride) intake leads to many significant illnesses.

The daily recommended intake of sodium is 1500mg (about 4g of salt as NaCl) with the maximum safe levels being around 2500mg of sodium. In the average western diet sodium intakes are commonly in the range of 3000 to 4500mg per day (8 to 12g/day of salt) (Karppanen 05). What does all this salt do to you? It raises your blood pressure in the longer term leading to increased hardening of the arteries resulting in more heart attacks, heart failure, strokes and poor kidney function

A major review was carried out by the Cochrane Collaboration (a peak medical evidence review body) which concluded that both people with normal or high blood pressure would benefit from a reduction in salt intake by around half, amounting to 4.4g per day, lowering systolic pressure by around 5 mm of Hg in hypertensives and 2mm of Hg in people with normal blood pressure. This was a continuous effect, the lower the salt, the lower the blood pressure (He 04).

The low-salt DASH diet showed more impressive reductions in blood pressure. (See below) Remarkable results have been seen in Finland with the progressive reduction in salt intake over 30 years from an average of around 15g/day to 8g/day. Diastolic blood pressure in men fell an average of 15mm of Hg, death from stroke fell by more than 60% and heart disease deaths in men by 75% (Karppanen 05). There are however major confounding issues in this study since smoking, alcohol consumption and fat intake have also fallen.

Excess salt may be implicated in calcium loss from bones either directly (Frassetto 01) or by inducing high blood pressure. There is a well established association between high blood pressure and osteoporosis (Cappuccio 99). Both the calcium loss in the urine and high blood pressure can be largely corrected by increasing the potassium intake.

Not everyone believes that salt intake is a problem. The food industry say there is insufficient evidence in people with normal blood pressure to reduce the salt content of food. This is backed up by significant medical opinion in two recent Cochrane reviews. (Jurgens 04)(Hooper 04) While both of these reviews noted that reducing sodium intake in the short term reduces blood pressure, these reductions have not been shown to be clinically significant in people with normal blood pressure, especially in the longer term. One study noted that the body increases the output of renin and aldosterone in the face of low sodium intake, counteracting the blood pressure lowering effect (Jurgens 04). Both studies note there is a larger effect in people with established high blood pressure.

Where does this leave us? First, specific studies need to be done in the longer term looking at lowered sodium intake against the various disorders listed above, something which will be very difficult to do. (Note the Finnish study above quoted by Karppanen as a clue however, there are probably

significant confounding factors as noted above.) Second, as there are a lot of people with unrecognized and hence untreated high blood pressure, a general lowering of salt would be useful. Finally as shown in the DASH studies, the real problem could be insufficient potassium intake as increasing potassium with fruit and vegetables reduces blood pressure without changing the intake of sodium. (See below) None of the Cochrane studies looked at this aspect specifically.

Where does all this salt come from? Salt in the form of sodium chloride is a major taste enhancer in food. Foods with higher salt levels are preferred by many people. Processed food manufacturers and restaurant/fast food outlets know this extremely well. Adding salt adds greatly to sales. So if you eat a lot of these sorts of foods because you like the taste, you will be getting large amounts of salt as an extra. Some very surprising foods have lots of added salt, even sweet things. Breakfast cereals are a good example. Read the food composition labels and you will soon get the idea. However, you have virtually no way of knowing what is in restaurant/fast food meals. The best thing is to eat a lot less of them that way you save a lot of money and do yourself a lot of good.

Potassium intake. Potassium is found in plentiful quantities vegetables. There is a lot less potassium in processed sugary foods. Meats have a moderate potassium content. However, it is much better to look at the overall intake from a group of foods. The DASH potassium intake is around 5000mg/day as opposed around 2000mg/day in a standard western diet. An intake of 4700mg/day is recommended. Increasing potassium intake not only lowers blood pressure (see DASH diet below) but also appears to improve glucose tolerance (diabetes) (Karppanen 05). Your potassium intake will be assured if you obtain at least two thirds of your energy from plant-based foods.

The DASH (Dietary Approaches to Stop Hypertension) diet. This diet is very similar to the Mediterranean diet emphasizing fruit and vegetables, wholegrain foods, poultry, nuts and low fat dairy products with only small amounts of red meat, sweets and sugar containing vegetables. It showed the effect of increasing the amount of potassium, magnesium and calcium, without changing sodium intake in the diet. The increases in these nutrients was achieved by increasing the fruit intake from 1.6 to 5.2 servings/day and vegetables from 2.0 to 3.3/day on average. Potassium intake rose from 1752 to 4101 mg/day, magnesium from 176 to 423mg/day and calcium from 443 to 534mg/day. Sodium intake remained around 3000mg/day. There was a significant drop in blood pressure of 5.5 and 3.0mm Hg systolic and diastolic respectively. The conclusion was that a diet rich in fruit and vegetables, with reduced saturated and total fat can substantially lower the blood pressure (Appel 97).

A further DASH study was done where the intake of salt (NaCl) was also adjusted between high (8.1g/day), intermediate (6.2g/day) and low (3.9g/day) of NaCl. The major effect was still the adoption of the DASH diet without salt restriction, causing just under 6mm of Hg fall in systolic blood

pressure. Salt restriction from high to low in the control non-DASH diet caused 6.7mm of Hg drop in blood pressure. However, when both the low salt and DASH were used together the total drop in systolic blood pressure was 8.9 mm of Hg. Significant falls also occurred in diastolic blood pressure (Sacks 01).

References:

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