



Salt & Blood Pressure

Introduction

A blood pressure of 140/90 mmHg or higher is called hypertension. However, the risk of cardiovascular disease increases throughout the range of blood pressure and there is no cut off point. Raised blood pressure is the major cause for the development of cardiovascular disease, and accounts for 60% of all strokes and 50% of all heart disease (*WHO, 2002*). Blood pressure is the biggest cause of death in the world through the strokes and heart attacks it causes. Approximately one in three adults in the UK (i.e. a total of 16 million) have high blood pressure. 5 million don't know they have the condition (*BPA News, 2009*).

Who is at risk?

Anyone is at risk of a high blood pressure, as blood pressure starts to increase from childhood. People with a high salt diet, pregnant women and of African origin are particularly susceptible to high blood pressure (BPA, 2008).

High blood pressure is an important risk factor for a range of conditions. These include strokes, vascular dementia, diabetes, kidney disease, heart disease, mobility problems and erectile dysfunction (BPA, 2008)). People who already have these conditions may find a reduced salt diet beneficial in the long run.

How does salt contribute?

A high salt diet disrupts the natural sodium balance in the body. This causes fluid retention which increases the pressure exerted by the blood against blood vessel walls (high blood pressure).

For every one gram of salt we cut from our average daily intake, there would be approximately 6,000 fewer deaths from strokes and heart attacks each year in the UK. It has been estimated that a reduction in salt intake from 10g a day to 6g will reduce blood pressure and could lead to a 16% reduction in deaths from strokes and a 12% reduction in deaths from coronary heart disease. This would prevent approximately 19,000 stroke and heart attack deaths in the UK each year and 2.6 million each year worldwide. Reducing salt is one of the quickest ways to reduce your blood pressure, particularly if you already have high blood pressure (He et al, 2002, He et al, 2006).

Evidence

A large number of studies have been conducted which have consistently shown that salt intake is the major factor increasing population blood pressure. The evidence is greater for the effect of salt on blood pressure than any other dietary and lifestyle factors including a low consumption of fruit and vegetables (i.e. low potassium intake), obesity, excess alcohol intake and lack of physical exercise.

A large study of 52 communities throughout the world - the InterSalt Study - has also been conducted (Fig. 1 Intersalt, 1988) by taking standardised measurements of blood pressure and 24 hour urinary sodium and potassium. The study showed a positive relationship between salt intake (using 24 hour urinary sodium excretion) and blood pressure. There was also a positive and highly significant relationship between salt intake and the

Salt Intake and Blood Pressure Rise with Age (INTERSALT)

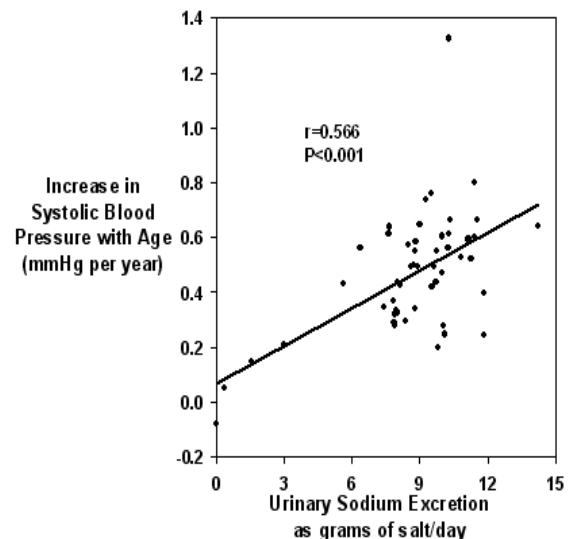


Figure 1. The relation of salt excretion to the slope of the rise in systolic blood pressure with age in 52 centres in the INTERSALT study. (Adapted from INTERSALT Study.

increase in blood pressure with age (Fig 1). This relationship showed that an increase of 6 grams of salt per day over 30 years would lead to an increase in systolic pressure by 9 mmHg (Intersalt 1988). This represents a large increase in population blood pressure.

Two studies (MacGregor et al, 1989, Sacks et al, 2001), both 4 weeks in duration, have compared the effect of different salt intakes on blood pressure (3, 6, and 12 g/day in one, 4, 6 and 8 g/day in the other). Both showed a clear dose-response relationship, i.e. the lower the salt intake achieved, the lower the blood pressure.

The most recent meta-analysis focusing on salt and blood pressure looked at 28 randomised trials (17 in hypertensives, 11 in normotensives (normal blood pressure)) with a duration of one month or longer. It showed that a modest reduction in salt intake led to a significant reduction in blood pressure, both in people with and without high blood pressure. A dose-response relationship between the reduction in salt intake and the decrease in blood pressure was also seen. It is estimated that a reduction of salt by 6 g/d would lower blood pressure by 7/4 mmHg in individuals with high blood pressure and 4/2 mmHg in those with normal blood pressure (He & Macgregor, 2002).

The relationships seen in these studies provide evidence that the recommendation to reduce salt intake to 5-6g/day will have a major impact on blood pressure and a further reduction to 3-4 g/day will have a much greater effect.

Current Salt Intake & Dietary Advice

Almost everyone in the UK (and the rest of the Western world) eats too much salt. The daily recommended amount in the UK is no more than 6 grams a day, the current average salt intake is 8.6g salt a day although many people are eating more than this.

People with or considered at risk of high blood pressure should take extra care to ensure that they keep their salt intake below the recommended maximum of 6g. This can be achieved by simple changes, such as consuming less processed foods and checking product labels before purchase.

For more information and advice on how to reduce your salt intake, please visit our website www.actiononhealth.org.uk

References

- Blood Pressure Association. 2008. <http://www.bpassoc.org.uk/BloodPressureandyou/Yourbody> [accessed 07/08/09]
- BPA News. 07/09/2009. Could you be the one in three at risk of the silent killer?
- Cutler JA, Follmann D, Allender PS: Randomized trials of sodium reduction: an overview. *Am J Clin Nutr* 65:643S-651S, 1997.
- [Elliott P, Stamler J, Nichols R, Dyer A R, Stamler R, Kesteloot H, Marmot M. Intersalt revisited: further analyses of 24 hour sodium excretion and blood pressure within and across populations. Intersalt Cooperative Research Group. *Bmj*. 1996;312:1249-53.](#)
- Graudal NA, Galloe AM, Garred P: Effects of sodium restriction on blood pressure, renin, aldosterone, catecholamines, cholesterols, and triglyceride: a meta-analysis. *JAMA* 279:1383-1391, 1998.
- He FJ, MacGregor GA. Effect of modest salt reduction on blood pressure: a meta-analysis of randomized trials. Implications for public health. *Journal of human hypertension*. 2002;16:761-770
- He FJ, MacGregor GA. Importance of determining blood pressure in children: Meta-analysis of controlled trials. *Hypertension*. 2006;48:861-869
- Hooper L, Bartlett C, Davey Smith G, et al: Systematic review of long term effects of advice to reduce dietary salt in adults. *BMJ* 325:628-632, 2002.
- [INTERSALT. Intersalt: an international study of electrolyte excretion and blood pressure. Results for 24 hour urinary sodium and potassium excretion. Intersalt Cooperative Research Group. *Bmj*. 1988;297:319-28.](#)
- Law MR, Frost CD, Wald NJ: By how much does dietary salt reduction lower blood pressure? III--Analysis of data from trials of salt reduction. *BMJ* 302:819-824, 1991.
- MacGregor GA, Markandu ND, Sagnella GA, et al: Double-blind study of three sodium intakes and long-term effects of sodium restriction in essential hypertension. *Lancet* 334:1244-1247, 1989
- Midgley JP, Matthews AG, Greenwood CM, et al: Effect of reduced dietary sodium on blood pressure: a meta-analysis of randomized controlled trials. *JAMA* 275:1590-1597, 1996.
- Sacks FM, Svetkey LP, Vollmer WM, et al: Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. DASH-Sodium Collaborative Research Group. *N Engl J Med* 344:3-10, 2001.
- World Health Report 2002: Reducing risks, promoting healthy life. World Health Organisation, 2002.

For further information contact CASH
 Email cash@qmul.ac.uk
 Website www.actiononsalt.org.uk