



**Sodium and cardiovascular disease
Indigenous health
Blood pressure and pregnancy**

More evidence that sodium reduction prevents cardiovascular disease

There is continuing debate from some quarters as to the need for population based salt reduction strategies despite the extensive population and trial based evidence on the role of salt in hypertension. Some of the uncertainty has stemmed from the relatively few studies linking population salt intake as an independent factor to cardiovascular morbidity or mortality in humans, although there is ample evidence for this in experimental animal models of cardiovascular disease. Another argument put forward for inaction is the lack of controlled clinical trial data showing effects of salt restriction on morbidity or mortality. For various practical reasons such trials are extremely hard to conduct in a meaningful manner in Westernised populations. Two North American trials (TOHP 1 and 2) of middle aged adults with 'prehypertension' were designed to examine the effects of reduced salt diets (intakes fell by an estimated 44 and 33 mmol/day respectively) on the development of hypertension and have now reported a 10-15 year follow up of cardiovascular events and total mortality. Follow up status was obtained on 77% and showed a statistically significant 25-30% reduction in cardiovascular events in the combined trials and a non significant trend in the smaller numbers dying. The authors concluded that the results suggest the sodium restriction previously shown to reduce blood pressure also reduces cardiovascular events.

Expert comment

This study provides further evidence for the benefits of salt reduced diet in people with 'prehypertension' ie the majority of the adult population in countries such as Australia. However the study does not meet the so called 'gold standard' of randomised controlled trials in that it was not designed to study long term outcomes and the analysis is years after the trials proper were completed; data from two trials were merged for the analysis; there is no information on diet or lifestyle or medications after the subjects completed the original studies; finally the diets were modified in several ways other than by reducing salt per se. Nonetheless along with other evidence it provides further support for the notion that dietary patterns that include less salt than the current average are likely to be beneficial rather than harmful. Other trial data suggests that such diets should also reduce needs for antihypertensive agents and enhance their effects when used.

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An integrated approach to management of cardiovascular risk is essential for remote Aboriginal communities

Aboriginal adults living in three remote communities in the Northern Territory have a large excess risk of proteinuria, high blood pressure and diabetes compared with adults in the AusDiab study (Hoy WE, Kondalsamy-Chennakesavan S, Wang Z *et al. Aust NZ J Public Health* 2007; 31(2):177–83). Data were compared between 10, 434 people in the AusDiab study and 814 Aboriginal people aged 25 to 74 years. Compared with AusDiab, rates for proteinuria were elevated two- to five-fold, rates for high blood pressure were elevated three- to eight-fold and rates of diabetes were elevated 5- to 10-fold for Aboriginal adults ($P < 0.001$ for all). Aboriginal adults living in these remote communities also had a greater probability of having multiple problems at all ages. The authors reported that these findings are compatible with the excess morbidity and mortality from renal disease, cardiovascular disease and diabetes in these Aboriginal groups. Furthermore, they reflect the multitude of risk factors operating in these remote Aboriginal communities, and support the need for an integrated rather than a disease-specific intervention program.

Expert comment

This study carried out in 3 top-end remote indigenous communities confirms a striking accentuation of risk of proteinuria, hypertension and diabetes mellitus in our aboriginal people. It predicts that by age 35 to 44 yr, six out of ten of the people from these communities will have at least one of these conditions with this figure increasing to eight out of ten for those 55 yr and older. Such an enhancement of risk of these conditions clearly underpins much of the equally alarming increase in mortality and morbidity from ischaemic heart disease, diabetes mellitus and renal failure seen in aboriginal communities. The data highlight the imperative for employing and training aboriginal health workers to be engaged not just in screening programmes but in systematic approaches to management and strategies for prevention if these unacceptable levels of risk are to be reduced. A focus on aspects of diet, overweight, smoking and alcohol use as well as developing approaches to deal with the high prevalence of low birth weight infants and high rates of chronic infection will be essential. Without such a coordinated and targeted health service response as these figures demand, unacceptable levels of death and disability from what is largely preventable cardiovascular and renal disease will continue.

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Calcium supplements ineffective for control of blood pressure in pregnancy

Calcium supplements are unlikely to reduce the risk of developing high blood pressure during pregnancy according to an evidence-based review by the US Food and Drug Administration (Trumbo PR, Ellwood KC. *Nutr Rev* 2007; 65(2): 78–87. The FDA project evaluated 55 human intervention studies and 60 observational studies for its review. Whilst it found some evidence to suggest a possible relationship between supplemental calcium intake and a lower risk of high blood pressure or pre-eclampsia, the totality of the evidence was inconsistent and inconclusive. The FDA noted that the strongest evidence from a large randomised trial showed no beneficial effect of calcium on pregnancy-induced high blood pressure or pre-eclampsia, although smaller intervention studies were considered sufficient to provide for a qualified health claim.

Expert comment

The role of calcium in hypertension and cardiovascular health has been an issue for a considerable time. A number of population surveys have found a relationship with a strong p-value (< 0.0001) but the amount of hypertension or elevated blood pressure that is explained by a reduced calcium intake is probably less than 2%. An early study performed in the United States in 1985 reported that increasing the intake of calcium reduced blood pressure but the design of the study was flawed and subsequent studies could not confirm the results. This review provides strong evidence that supplemental calcium has no major effect on blood pressure and is not a widely applicable strategy for the prevention of hypertension or pre-eclampsia during pregnancy. There remains the possibility that some groups may experience a very small effect. These include people with a very low calcium intake and people on a very high sodium intake. In Australia, the benefits are likely to be small since dietary intake of calcium is higher in Australia than the United States. There are many good reasons to ensure that the intake of calcium and its absorption is adequate. However the prevention or treatment of hypertension is not one of these reasons.

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