

Summer Meeting, 15–18 July 2013, Nutrition and healthy ageing

Dietary magnesium intake and blood pressure in an adult British population

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High blood pressure (BP) has been reported as the single most modifiable known risk factor for stroke and is attributable for up to 70% of all cases⁽¹⁾. Dietary factors are reported to influence blood pressure both positively and negatively, with high intakes of salt, alcohol, and saturated fat associated with increased blood pressure whilst increased consumption of fruit and vegetables, whole grains and micro-nutrients such as potassium, and calcium may reduce blood pressure⁽²⁾. The effects of dietary magnesium intakes has to date been less well studied with inconclusive findings, particularly in the British population. The aim of this study was to explore potential associations between dietary magnesium intakes and blood pressure in relation to stroke risk.

The cohort analysed during the present study was a randomly selected sample of 4,361 men and women from the whole ($n \sim 25,000$) EPIC-Norfolk cohort with completed 7-D food diaries. Ethical approval was obtained from Norwich District Health Authority ethics committee. Adjusted mean SBP, DBP and PP were determined across sex-stratified quintiles of dietary magnesium intake. Multivariate adjustment was made for age, BMI, total energy intake, education level, smoking status, physical activity, baseline history of stroke, heart attack or diabetes mellitus, family history of stroke or heart attack, use of aspirin medication (>3 month), antihypertensive medication, dietary sodium, potassium, alcohol and total fat intake (Table below). Forty four percent of the study population were men and the age range was 39–80 years. Mean BP was 139/85 and 136/82 mmHg for men and women respectively and mean PP was 54.2 and 54.0 mmHg respectively. (Statistical analyses were conducted using STATA, version 11.0 (StataCorp. 2009)).

	Men					Women				
	Q1 85–242 mg $n = 388$	SE	Q5 387–829 mg $n = 387$	SE	P for Trend	Q1 48–204 mg $n = 485$	SE	Q5 321–691 mg $n = 484$	SE	P for Trend
SBP	143	1.14	136	1.16	0.001	136	1.06	135	1.06	0.68
DBP	87.3	0.74	82.9	0.59	0.001	82.2	0.66	81.3	0.67	0.38
PP	55.8	0.67	53.0	0.68	0.04	54.2	0.61	54.0	0.62	0.82

These results indicate an inverse relationship between dietary magnesium and blood pressure, significant in men, but not in women. In men differences between top and bottom quintiles of -7 mmHg and -4.3 mmHg, for SBP and DBP respectively were observed. This decrease in BP could be associated with a reduction of stroke risk by up to 40%⁽³⁾. The role of dietary magnesium in blood pressure regulation should be further explored.

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