

### Long-term prognostic implications of visit-to-visit blood pressure variability in patients with ischaemic stroke

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**Background:** Both blood pressure (BP) and its variability (BPV) are established risk factors for the development of atherosclerotic diseases and are associated with an increased risk of cardiovascular and all-cause mortality. The long-term prognostic implications of out-patient clinic visit-to-visit BPV among patients with ischaemic stroke are nevertheless unknown.

**Methods:** We prospectively followed up the clinical outcome of 632 consecutive ischaemic stroke patients without atrial fibrillation. The mean BP and BPV, as determined by the coefficient of variation of the systolic and diastolic BP, were recorded during a mean of  $12 \pm 6$  outpatient clinic visits.

**Results:** The mean age of the patients was  $71 \pm 11$  years. After a mean of  $76 \pm 18$  month's follow-up, 161 (26%) patients died, 35% (56/161) were due to cardiovascular causes. 16% and 5% developed recurrent stroke and acute coronary syndrome (ACS), respectively. After adjusting for mean systolic BP and confounding variables, patients with a high systolic BPV were at significantly greater risk of cardiovascular mortality (hazard ratio [HR] = 2.36; 95% confidence interval [CI], 1.02-5.49;  $P < 0.05$ ). A high systolic BPV also predicted all-cause mortality after adjusting for mean systolic BP (HR = 1.79; 95% CI, 1.16-2.75;  $P < 0.05$ ). There was no association between systolic BPV with non-fatal recurrent stroke nor non-fatal ACS. A raised diastolic BPV did not predict recurrent non-fatal stroke, non-fatal ACS nor mortality.

**Conclusions:** Visit-to-visit systolic BPV predicts long-term all-cause and cardiovascular mortality in patients with ischaemic stroke without atrial fibrillation, independent of other conventional risk factors including average BP control.

### Mediterranean diet reduces blood pressure variability and subsequent stroke risk in patients with coronary artery disease

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**Introduction:** The Mediterranean diet has been widely advocated for the prevention of cardiovascular and cerebrovascular diseases. Meanwhile, visit-to-visit blood pressure variability (BPV) is a novel risk factor for the development of atherosclerotic diseases. However, whether diet plays a role in modulating BPV remains uncertain. We investigated whether the Mediterranean diet is associated with BPV and subsequent prognosis in patients with coronary artery disease (CAD).

**Methods:** A total of 274 consecutive patients with stable CAD were recruited in 2005-2006. All patients underwent a food frequency questionnaire (FFQ) to delineate their dietary intake within the past 5 years. A Mediterranean Diet Score was derived based on components within the FFQ (a higher score reflecting more components of the Mediterranean diet being taken). Patients were followed up regularly every 3-4 months and their blood pressure measured during each visit. The development of acute coronary syndrome (ACS), heart failure requiring hospitalisation, stroke and cardiovascular mortality during the follow-up period was monitored.

**Results:** After a mean follow-up of  $77 \pm 12$  months, 20 (7.3% of the study population), 29 (10.6%), 13 (4.7%), and 19 (6.9%) patients developed ACS, heart failure, stroke, and cardiovascular mortality, respectively. Patients who developed a stroke had a significantly lower Mediterranean Diet Score ( $1.7 \pm 0.5$  vs  $2.6 \pm 1.1$ ;  $P < 0.01$ ) and significantly higher visit-to-visit BPV (systolic blood pressure standard deviation  $20 \pm 9$  mm Hg vs  $14 \pm 5$  mm Hg;  $P = 0.03$ ) compared to those who did not develop stroke. There were no differences in Mediterranean Diet Score among patients who did and did not develop ACS, heart failure, and cardiovascular mortality. A low Mediterranean Diet Score independently predicted a raised systolic BPV (B, -0.61; 95% confidence interval [CI], -1.16 to -0.07;  $P = 0.03$ ). After adjustment for confounding variables, a higher Mediterranean Diet Score reduced the subsequent risk of stroke (hazard ratio [HR] = 0.34; 95% CI, 0.15-0.75;  $P < 0.01$ ) whilst a high systolic BPV significantly increased the risk of stroke (HR = 1.13; 95% CI 1.03-1.24;  $P = 0.01$ ).

**Conclusion:** In patients with CAD, adopting a Mediterranean diet reduces BPV and subsequent stroke risk.