

Increased fluctuation in blood pressure linked to impaired cognitive function in older people

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Higher variability in visit-to-visit blood pressure readings, independent of average blood pressure, could be related to impaired cognitive function in old age in those already at high risk of cardiovascular disease, suggests a paper published today in *BMJ*.

There is increasing evidence that vascular factors contribute in development and progression of dementia. This is of special interest as cardiovascular factors may be amendable and thus potential targets to reduce [cognitive decline](#) and the incidence of dementia. Visit-to-visit [blood pressure](#) variability has been linked to cerebrovascular damage (relating to the brain and its blood vessels). It has also been shown that this variability can increase the risk of stroke.

It has been suggested that higher blood pressure variability might potentially lead to [cognitive](#) impairment through changes in the brain structures.

Researchers from the Leiden University Medical Center (Netherlands), University College Cork (Ireland) and the Glasgow University (UK) therefore investigated the association of visit-to-visit blood pressure variability (independent of average blood pressure) with cognitive function in older subjects at high risk of cardiovascular disease.

All data were obtained from the PROSPER study, which investigated the

effect of statins in prevention of vascular events in older men and women. This study took data on 5,461 individuals aged 70-82 years old in Ireland, Scotland and the Netherlands. Average follow-up was three years.

Both systolic (peak pressure) and diastolic (minimum pressure) blood pressures were measured every three months in the same clinical setting. The variability between these measurements were calculated and used in the analyses.

The study used data on cognitive function where the following was tested: [selective attention](#) and reaction time; general cognitive speed; immediate and delayed [memory performance](#).

Results showed that visit-to-visit blood pressure variability was associated with worse performance on all cognitive tests. The results were consistent after adjusting for cardiovascular disease and other risk factors.

The main findings of the study were: higher visit-to-visit blood pressure variability is associated with worse performance in different cognitive tests; higher variability is associated with higher risk of stroke and both these associations are independent of various cardiovascular risk factors, in particular, average blood pressure.

Researcher Simon Mooijaart, (Leiden University Medical Centre, Leiden, the Netherlands) says that by using a population of "over five thousand participants and over three years of blood pressure measurements, we showed that high visit-to-visit systolic and diastolic blood pressure variability associates with worse performance in different domains of cognitive function including selection attention, processing speed, immediate verbal memory and delayed verbal memory". The researchers do add though that it is still unclear whether higher blood

pressure variability is a cause or consequence of impaired cognitive function.

They suggest several explanations for their findings: firstly that blood pressure variability and cognitive impairment could stem from a common cause, with cardiovascular risk factors being the most likely candidate; secondly that variability might reflect a long term instability in the regulation of blood pressure and blood flow to the key organs in the body; thirdly that exaggerated fluctuations in blood pressure could result in the brain not receiving enough blood, which can cause brain injury, leading to impairment of cognitive function.

The researchers conclude that "higher visit-to-visit blood pressure variability independent of average blood pressure might be a potential risk factor with worse cognitive performance in older subjects at high risk of cardiovascular disease". Given that dementia is a major public health issue, they say that further interventional studies are warranted to establish whether reducing blood pressure variability can decrease the risk of cognitive impairment in old age.

Provided by British Medical Journal

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