

Blood pressure medication does not completely restore vascular function

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High blood pressure. Credit: Lancaster University

Treatments for high blood pressure do not totally reverse its damaging effects on the vascular rhythms that help circulation of the blood say researchers.

The World Health Organisation says hypertension affects about 40% of those aged over 25 and is a major risk factor for heart disease, stroke and kidney failure.

An interdisciplinary group of scientists from Lancaster University found that conventional medication aimed at reducing [high blood pressure](#) restored normal vascular rhythms only in the largest blood vessels but not the smallest ones.

Professor Aneta Stefanovska said: "It is clear that current anti-hypertensive treatments, while successfully controlling blood [pressure](#), do not restore microvascular function."

Based on a networks physiology approach, the researchers compared a group aged in their twenties and two older groups aged around 70 – one with no history of hypertension and the other taking medications for high blood pressure.

In the older group being treated for high blood pressure the drug treatment restored normal function at the level of arterioles and larger vessels.

But when the researchers studied the nonlinear dynamical properties of the smallest [blood](#) vessels in the body, they found differences between the two older groups.

"Specifically, current hypertensive treatment did not fully restore the coherence or the strength of coupling between oscillations in the heart rate, respiration, and vascular rhythms (vasomotion).

"These are thought to be important in the efficient and adaptive behaviour of the cardiovascular system. Indeed, one aspect of ageing is the progressive physiological weakening of these links that keep the cardiovascular system reactive and functional.

"The results have not only confirmed previous observations of progressive impairment with age of the underlying mechanisms of coordination between cardiac and microvascular activity, but for the first time have revealed that these effects are exacerbated in hypertension.

"Current antihypertensive [treatment](#) is evidently unable to correct this dysfunction. Our novel multiscale analysis methods could help in optimising future drug developments that would benefit from taking microvascular function into account."

More information: Valentina Ticcinelli et al. Coherence and Coupling Functions Reveal Microvascular Impairment in Treated Hypertension, *Frontiers in Physiology* (2017). [DOI: 10.3389/fphys.2017.00749](https://doi.org/10.3389/fphys.2017.00749)

Provided by Lancaster University

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