Is it really only our kidneys that control blood pressure?

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The problem of high blood pressure has reached pandemic proportions, causing premature death through heart attacks, strokes and kidney disease in a third of the UK population. For decades, scientists have battled at length over its cause yet still cannot agree; is the kidney or the brain to blame?

This month, Experimental Physiology hosts a lively debate between two groups of world-leading experts. In the first ever published dialogue on the topic, Drs Montani & Vliet and Drs Osborn, Averina & Fink share their opinions with us and criticise each-others theories. Their frank exchange of views provides an interesting and informative summary of the latest research into how blood pressure is controlled.

When blood pressure increases the kidneys respond by extracting extra water and salts into the urine, causing blood volume — and hence pressure — to fall. But special nerve pathways mean the brain can also regulate urine production and hence influence blood pressure. So which organ is really in charge?

Montani & Vliet argue that controlling blood volume is the key, as the kidney automatically makes more urine as blood pressure increases.

However, Osborn and colleagues remind us that the cardiovascular system is controlled by multiple mechanisms including the automatic part of the nervous system, which directly controls the kidney. They also update us on a plethora of new findings supporting a role of the nervous

system in controlling blood pressure long term.

But both groups acknowledge that new mathematical models are needed that incorporate both the kidney and the brain control systems. So the question of whether it is the kidney or the brain that has a firmer grip on the reins for controlling blood pressure may have to wait for a mathematician to answer.

Professor David Paterson, the Chief Editor of *Experimental Physiology* and instigator of the debate, said: "This frank exchange of views was needed as it highlights major issues that remain with blood pressure control and will undoubtedly guide future studies to reveal fundamental new knowledge that will inform the future treatment of high blood pressure."

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