

Researchers identify new gene variants that cause hypertension in pregnant women

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An international study, led by researchers from Queen Mary University of London and St Bartholomew's Hospital, has found a unique pair of gene variants that causes sudden onset high blood pressure in pregnant women.

The research in the UK was funded by the National Institute of Health Research, their EME program in partnership with the Medical Research Council, the British Heart Foundation and Barts Charity.

Hypertension ([high blood pressure](#)) affects 30% of adults. Most cases are caused by a combination of inherited and acquired factors that require long-term treatment to prevent the complications of stroke and heart attacks.

For one in ten people with [hypertension](#), a specific cause can be found and removed. The most common cause is a tiny benign nodule in one of the adrenals. These are glands near the kidneys that produce steroid hormones. The hormone aldosterone stimulates the kidneys to retain salt and hence increase blood pressure. As a result the condition known as *primary aldosteronism* typically leads to a type of hypertension which is resistant to conventional drugs, and is linked to an increased risk of stroke and heart attacks compared to other patients with hypertension.

Over the years, a research team at Queen Mary University of London and St Bartholomew's Hospital has found a number of gene variants which cause the production of high levels of aldosterone from small adrenal nodules. Their latest study, published today in the journal *Nature Genetics*, is the discovery of a new type of primary aldosteronism caused by the coincidence of a unique pair of new variants which always occur

together. The patients are predominantly women, who present with sudden onset of high blood pressure and low blood potassium in the early months of a pregnancy.

In partnership with Professor Christina Zennaro, Inserm Research Director at the Paris Cardiovascular Research Center, and colleagues in Paris, it emerged that the new variants switch on a receptor molecule in the adrenal cells which recognizes the pregnancy hormone Human Chorionic Gonadotropin (HCG), the same as is measured in routine pregnancy testing—and that the receptor molecule triggers a surge of aldosterone production.

Professor Morris Brown, Professor of Endocrine Hypertension at Queen Mary University of London said: "What was particularly satisfying is that recognition of the cause of hypertension in these women enabled them to complete a successful pregnancy, and that afterwards they were completely cured of hypertension by a procedure to remove the adrenal nodule, and were able to stop all their drugs."

More information: Somatic mutations of GNA11 and GNAQ in CTNNB1-mutant aldosterone-producing adenomas presenting in puberty, pregnancy or menopause, *Nature Genetics* (2021). [DOI: 10.1038/s41588-021-00906-y](https://doi.org/10.1038/s41588-021-00906-y) , www.nature.com/articles/s41588-021-00906-y

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