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News Release

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Immune cell clues offer hope to hypertension patients, study suggests

Scientists have pinpointed cells in the immune system that could be key to tackling high blood pressure.

The findings also shed light on current treatments that could increase risk of the disorder, which affects more than 12 million people in the UK.

High blood pressure – or hypertension – is a leading cause of life-threatening conditions including heart attack, kidney disease and stroke.

The study revealed a new role for specialised white blood cells – known as macrophages – that are central to the body's immune system.

Researchers led by the University of Edinburgh discovered that macrophages scavenge for and 'eat' molecules of a powerful hormone known as endothelin.

By monitoring and regulating endothelin levels in the blood, these white blood cells help blood vessels relax, significantly lowering blood pressure.

The scientists found that lowering levels of macrophages increased blood pressure in mice fed a high salt diet. When the macrophage level returned to normal, blood pressure also normalised.

The same findings were replicated in mice genetically bred with a deficiency of the endothelin system and in mice with drug-induced high blood pressure.

The researchers then looked at white blood cells in patients taking medication for an immune system disorder that attacks blood vessels.

Those taking medication known to reduce macrophages had higher blood pressure compared with patients taking other medications.

Scientists say these findings could help spot people most at risk of developing hypertension. The study could open avenues to improve current therapies, although researchers caution that further human studies are needed.

The study, published in the *European Heart Journal*, was funded by the British Heart Foundation.

Professor Matthew Bailey, Chair in Renal Physiology at the University of Edinburgh's British Heart Foundation Centre of Research Excellence, who led the study, said:

"Hypertension affects millions of people across the globe, including 70 per cent of people over 70.

"Our discovery sheds light on risk factors, and crucially, opens routes to investigate new drugs that could help patients. Our next steps will be to investigate the role of macrophages in people living with hypertension."

Jeremy Pearson, Associate Medical Director at The British Heart Foundation, said: "In the UK, an estimated 6.8 million people are living with undiagnosed high blood pressure. This causes damage to the heart and blood vessels, putting you at risk of a potentially fatal heart attack or stroke. But we still don't fully understand all the mechanisms that lead to high blood pressure.

"This study shows for the first time that macrophages – a type of cell that helps regulate our immune responses – can be involved in the control of blood pressure. More research is needed but these cells could be a new target for drugs to treat the condition."

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Notes to editors

Original paper: "A novel role for myeloid endothelin-B receptors in hypertension", by Alicja Czopek et al. *European Heart Journal*. doi:10.1093/eurheartj/ehy881

After publication the paper can be accessed at: <https://academic.oup.com/eurheartj/article-lookup/doi/10.1093/eurheartj/ehy881>