



Aldosterone – the key to curing high blood pressure?

Understanding the role of the hormone aldosterone could provide hope of new therapeutic treatments to millions of people who suffer from high blood pressure. That's the conclusion of a large body of research being presented today at the annual Society for Endocrinology BES meeting in Harrogate. Aldosterone plays a key role in regulating blood pressure and can affect how susceptible you are to developing hypertension later in life.

Researchers at the Medical Research Council Blood Pressure Unit at the University of Glasgow, led by Prof John Connell, have studied the way in which aldosterone affects blood pressure regulation. Aldosterone is a hormone that is produced by the adrenal glands. It acts on the kidneys to make sure that salt levels in the blood are kept at a safe level. However, it also has important actions to alter heart and blood vessel function. Too much aldosterone increases the risk of stroke and heart failure.

The group found that in older people, higher levels of aldosterone in the bloodstream are associated with high blood pressure, while in young adults, high aldosterone levels indicate you are more likely to subsequently develop hypertension later in life. Individual aldosterone levels are determined by a number of factors. People born with a low birth weight tend to have higher aldosterone levels when they are older. Another important influence is genetics - some people have variants of a gene that controls aldosterone that works more efficiently than others. This means that throughout life, certain individuals will have higher aldosterone levels and are more prone to developing high blood pressure. This also suggests that in the future, we may be able to predict from an early age which individuals are more likely to develop hypertension. Lifestyle modification and new drug treatments might then be targeted specifically at this group of people.

Approximately 1 in 4 people in the UK have hypertension. The higher your blood pressure, the greater your risk of suffering from a heart attack or a stroke. Evidence suggests that aldosterone may be a causal factor in 10% of patients with high blood pressure⁽¹⁾.

Researcher Prof John Connell said:

“Aldosterone is a key cardiovascular hormone. The higher the level of aldosterone in your blood, the more likely it is that you will suffer from high blood pressure, which will increase your risk of suffering a heart attack or a stroke.

Through our research, we have discovered some of the factors that predispose you to having higher aldosterone levels. We now need to build up a better understanding of how production of aldosterone throughout life is controlled. This could help us to discover how to prevent blood pressure rising with age and also allow us to target new drug treatments for high blood pressure.”

-----Ends-----

Notes for editors

(1) Connell, J.M.C., Davies, E. 2005. *Journal of Endocrinology*, **186**, 1-20.

The paper will be presented at the Society for Endocrinology BES meeting at 08:55 on Thursday 10 April 2008. The abstract for this work is reproduced below: see <http://www.endocrine-abstracts.org/ea/0015/ea0015S8.htm>. Please note this presentation forms the Clinical Endocrinology Trust lecture and is supported by the Clinical Endocrinology Trust.

The Society for Endocrinology BES 2008 is Britain's biggest scientific meeting on hormones, and is taking place at the Harrogate International Centre, Harrogate, from 7-10 April 2008. For the full programme, please see <http://www.endocrinology.org/meetings/2008/BES2008/prog/prog.aspx>.

Please mention the Society for Endocrinology BES meeting in any story

The Society for Endocrinology is Britain's national organisation promoting endocrinology and hormone awareness. For general information, please visit our website: <http://www.endocrinology.org>

For more information: please contact the Society for Endocrinology press office

Jennie Evans

Public & Media Relations Officer
Mobile: +44 (0)7773 797 501
Email: jennie.evans@endocrinology.org

Rebecca Dixon

Public & Media Relations Assistant
Tel: +44(0)1454 642 252
Email: rebecca.dixon@endocrinology.org

ABSTRACT

Aldosterone and cardiovascular function – a lifetime of damage

John Connell

University of Glasgow, Glasgow, UK.

Aldosterone has important effects on blood pressure regulation and electrolyte haemostasis: recent data from Framingham confirm that plasma levels of the hormone predict subsequent development of hypertension in young adults, while our own data show that plasma aldosterone correlates with blood pressure in older subjects, and is inversely associated with birth weight. It is clear, therefore, that long-term regulation of aldosterone is important in setting blood pressure levels and determining cardiovascular dysfunction.

We have previously shown that levels of aldosterone in urine and plasma are heritable, and associated with common variants in the gene encoding aldosterone synthase. More recently, we reported that this was more closely linked to variation in the adjacent gene (CYP11B1) encoding 11 β hydroxylase. This also is associated with loss of efficiency of conversion of deoxycortisol to cortisol. As a consequence,

we also propose that there is a digenic effect that tends to increase aldosterone production, with inefficient 11 β hydroxylation causing a long-term increase in ACTH drive to the adrenal, with enhanced expression of CYP11B2 (encoding aldosterone synthase) resulting in chronically raised aldosterone secretion in response to factors such as angiotensin 11 and potassium.

In susceptible subjects this is likely, over many years, to result in hypertension with relative aldosterone excess. The hypothesis is supported by very recent data in large population case-control studies of hypertension that show an association between the above variants and high blood pressure