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Central blood pressure in the management of cardiovascular disease; A paradigm shift

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AIT Austrian Institute of Technology
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Abstract

Since the introduction of the sphygmomanometer into clinical practice, arterial pressure has conventionally been measured in the arm. Indeed, brachial blood pressure measurements are still the norm today. This is due to the ease of measurement and the demonstration of its correlation with cardiovascular events.

Recently, however, there has been growing recognition that the disease of interest is in the arteries and that elevated brachial blood pressure, although it may serve as a crude surrogate for arterial disease it is neither a sensitive nor specific guide to its presence. Therefore, a number of non-invasive methods have been introduced to gain a better insight into abnormalities of the arterial wall that better define the atherosclerotic process.

For many years, invasive measurements in cardiac catheter laboratories have shown that there was considerable difference between brachial and central systolic blood pressure. This is due to the phenomenon of pressure amplification as the pressure wave travels from the aorta to the brachial artery. However, although it is central aortic pressure that the heart and brain actually 'see', until recently this could only be measured invasively. However, a number of non-invasive techniques for measurement of central blood pressure have now been developed and validated. These include the calibration technique and the use of a generalised transfer function.

Using such technology, central blood pressure has been shown to predict both cardiovascular risk and outcome. Furthermore differences between central and peripheral pressure have been demonstrated in a number of disease states including diabetes and hypercholesterolaemia. Most recently central blood pressure has been shown to be a better predictor of cardiovascular outcome

than brachial blood pressure. Furthermore, a recent study involving the population based Anglo Cardiff Collaborative Trial (ACCT) demonstrated that central blood pressure measurements may improve cardiovascular risk stratification. This was also supported by similar data from an Australian population. The measurement of central blood pressure represents a paradigm shift in hypertension and is likely to be increasingly introduced to regular clinical practice over the next decade.

Biosketch

John Cockcroft is Professor of Cardiology at the Wales Heart Research Institute in Cardiff. He is also visting Professor in the Department of Cardiology at Columbia Presbyterian Hospital NewYork and adjunct Professor in the Australian School of Advanced Medicine Mcquarie University, Sydney, Australia

His major research interests focus on endothelial function and arterial stiffness in health and disease. Recently he has become interested in the mechanisms of vascular calcification especially in patients with renal disease. He is currently researching the relationship between osteoporosis and vascular calcification. He has published over a 150 peer reviewed articles and has co-authored books on hypertension and coronary heart disease. He is a founding member of the Association for Research into Arterial Structure and Physiology (ARTERY) and is co-organiser of the Association's conferences. Currently he is the president of ARTERY Secretary of The European Association of Clinical Pharmacology and Therapeutics (EACPT)

Professor Cockcroft's clinical interests focus on hypertension and cardiovascular disease prevention and he was a member of the committee which produced the Welsh National Service Framework for cardiovascular disease. He is especially interested in patient empowerment and promoting more informed involvement with their care and treatment, and has lectured widely to patient groups on hypertension and cardiovascular disease. Indeed, 10 years ago he established the first patient self referral clinic in the UK, which has proved extremely popular with patients interested in establishing their own cardiovascular risk and learning more about cardiovascular risk factors in general. He has also run mobile cardiac vascular risk factor screening clinics Wales wide and also in England.

Professor Cockcroft is a member of the British, European, American and International societies of Hypertension the British Cardiac Society and also the European Association for the Study of Diabetes. Most recently, he has been elected Secretary of The European Association of Clinical Pharmacology and Therapeutics.