Blood pressure variability: clarity for clinical practice

Prof Eoin O’Brien focuses on the consequences of blood-pressure fluctuations on cardiovascular outcomes

We have recently seen a virtual deluge of papers (site in all) in two of the world’s most prestigious journals — The Lancet and Lancet Neurology — on an often-neglected aspect of blood pressure, namely its variability and the consequences of fluctuations in blood pressure on cardiovascular outcome, especially stroke. Prof Peter Rothwell, Department of Clinical Neurology, University of Oxford initiated and led the research project that culminated in these papers. However, these papers, by virtue of their sheer volume (almost 50 pages of printed text and 75 pages of supplementary webappendix data), could overwhelm all but the most stoic readers and misinterpretation of the data could lead to confusion and have an adverse effect on clinical practice. It is important, therefore, to assess the scientific reality and determine how this can benefit patients with hypertension.

The papers can be divided into two groups — three papers give the facts as derived from re-analyses of scientific data in a number of large clinical trials,1–3 and three papers comment in varying detail on the importance of the analyses.4–6

A summary

The three scientific studies show that blood pressure variability whether measured on clinic visits or on ABPM is predictive for stroke and it would appear from a number of analyses that calcium-channel blockers (CCB) and to a lesser extent thiazide diuretics are superior to other drugs in reducing variability and thereby reducing stroke and other vascular events, and that the older beta-blockers increase blood pressure variability and should probably only be used as first-line drugs if there are other compelling clinical indications, such as ischemic heart disease.

The three commentary papers agree that lowering of mean blood pressure, as is common practice, is not in question and should continue. However, patients with consistently normal systolic blood pressure have fewer vascular events than patients with normal systolic blood pressure and high blood pressure variability.

Reductions in variability, rather than reductions in mean blood pressure, might therefore account for some of benefits of antihypertensive drugs.

Further research is needed to refine understanding of the causes, consequences, and treatment of variability in blood pressure. The pharmaceutical industry needs to provide drugs that not only reduce mean blood pressure but that also reduce variability.

Finally, trials are needed to evaluate drugs and combinations of drugs that reduce both mean blood pressure and BP variability.

Not readily done

How then do we take account of blood pressure variability in practice? Detecting variability appears easy in retrospect, studies, such as those reported in The Lancet, but this is not readily done in practice. Improved methods of collecting data electronically so as to detect trends in blood pressure in the office and home and the increased use of ABPM are methods that should be more widely available.

However, there are more immediate solutions at hand on the therapeutic front. The pharmaceutical industry has recognised the need for flexible dose combinations within one tablet — what I will term the flexipill to differentiate it from its more primitive predecessor the poly pill, which only provides fixed-dose combinations in one tablet.

ARBs and CCBs

In this regard, we have flexipill combinations of ARBs and CCBs (olmesartan and amlodipine, valsartan and amiodipine, ACE inhibitors and CCBs (perindopril and felodipine, enalapril and lercanidipine); ARBs and thiazide diuretics (olmesartan, valsartan, irbesartan, telmisartan, losartan, HCTZ; ACE inhibitors and non-loop diuretics (captopril, lisinopril, ramipril and HCTZ, perindopril and indapamide).

There are also beta-blocker flexipills (nabivolol and HCTZ and Atenolol and HCTZ) and a rennin inhibitor flexipill (aliskiren and HCTZ). These flexipills allow a prescribing physician to increase the dosage of the component parts in one tablet, according to blood pressure variability. The flexipill allows prescribing of low doses of two drugs in one tablet, thereby minimising the adverse effects that might occur with higher doses of the individual components.

This advantage provides a means of overcoming therapeu- tic inertia and improving 2010 DOI: 10.1086/653485.

References:


4. Rothwell PM. Limitations of the usual blood-pressure hypothesis and importance of variability, instability, and episodic hypertension. Lancet 2010; 375: 938–48


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General practitioner checking the blood pressure of a patient