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Self-management of hypertension in people at high risk of cardiovascular events

An open-label randomised controlled trial finds that people with hypertension who self-monitor their blood pressure and up-titrate their antihypertensive medication experience a greater reduction in systolic blood pressure than people who manage hypertension with usual care.

Overview: Hypertension (high blood pressure) is one of the most important preventable causes of premature morbidity and mortality in the UK. It is a major risk factor for ischaemic and haemorrhagic stroke, myocardial infarction, heart failure, chronic kidney disease, cognitive decline and premature death. Each 2 mmHg rise in systolic blood pressure is associated with a 7% increased risk of mortality from ischaemic heart disease and a 10% increased risk of mortality from stroke (NICE 2011).

Self-monitoring of blood pressure and self-titration of antihypertensive medication, combined with telemonitoring of home blood pressure measurements, has been shown to reduce systolic blood pressure after 12 months better than usual care (McManus et al. 2010). However, it is not clear how self-monitoring affects blood pressure in people at high risk of cardiovascular events, such as those with diabetes, chronic kidney disease or cardiovascular disease.

Current advice: NICE guidance on hypertension recommends using clinic blood pressure measurements to monitor the response to antihypertensive treatment. Ambulatory or home blood pressure monitoring is recommended as an adjunct to clinic monitoring for people experiencing a 'white-coat effect' (a discrepancy of more than 20/10 mmHg between clinic and average daytime ambulatory or average home blood pressure measurements at the time of diagnosis).

The NICE guidelines on type 2 diabetes (currently being updated) and chronic kidney disease provide recommendations on specific blood pressure targets and treatments for each condition.

The NICE Pathway on hypertension brings together all related NICE guidance and associated products on the condition in a set of interactive topic-based diagrams.

New evidence: A randomised controlled trial (McManus et al. 2014) compared self-management of hypertension, through home-monitoring and self-titration of antihypertensive medication, with usual care by a person’s GP in high-risk patients – that is, people with poorly controlled blood pressure at high risk of cardiovascular events.

This 12 month, open-label randomised controlled trial included 555 people aged 35 years or older (mean age 69 years) with at least 1 high-risk condition (cardiovascular disease, diabetes, stage 3 chronic kidney disease, or coronary heart disease) and a baseline clinic blood pressure reading of at least 130/80 mmHg. Participants did not need to be receiving antihypertensive medication to be included in the trial.

Participants randomised to self-management (n=277) were trained to self-monitor their blood pressure twice each morning for the first week of each month using a validated machine. Participants
up-titrated their antihypertensive medication according to a pre-agreed plan if 4 or more readings during the measurement week for 2 consecutive months were above the target of 120/75 mmHg. Participants randomised to usual care (control, n=278) had a GP appointment for a routine blood pressure check and medication review, after which blood pressure measurements, targets and medication adjustments were at the GP’s discretion.

After 12 months, mean blood pressure had decreased to 128.2/73.8 mmHg (from a baseline of 143.1/80.5 mmHg) in the self-management group and to 137.8/76.3 mmHg (from a baseline of 143.6/79.5 mmHg) in the usual care group. This gave a mean difference in systolic blood pressure between the groups (the primary outcome) of 9.2 mmHg (95% confidence interval [CI] 5.7 to 12.7 mmHg).

At 12 months, the mean defined daily dose of antihypertensive drugs was 3.34 (95% CI 3.09 to 3.59) for the self-management group compared with 2.61 (95% CI 2.37 to 2.85) for the control group. The higher defined daily dose in the self-management group represented both a higher dose and a higher number of medications than in the usual care group. There were no statistically significant differences between treatment groups at 12 months for various adverse effects (such as swollen legs and ankles) or in quality of life.

The study had a higher than predicted drop-out rate (19% over 12 months), with most drop-outs occurring in the first 6 months of the trial, particularly in the self-management group. In addition, only 8% of people invited to take part in the trial were randomised, with around a third of those who declined to take part unwilling to measure their own blood pressure or alter their own medication.

**Commentary:** “Hypertension is an important preventable cause of morbidity and mortality in the UK. The results of this study support those people who wish to take greater control of this aspect of their own health. At least 30% of patients with hypertension are already self-monitoring in the UK, and more internationally, including a significant proportion of people with comorbidities.

“Although not statistically significant, self-management was less effective among more deprived participants. Therefore, more efforts may be needed to support patients in socioeconomically deprived communities. The majority of participants in this study were white (96%), so the results may not be generalisable to people from black, Asian and minority ethnic groups.

“The drop-out rate observed in the self-management group during the first 6 months of the study suggests that ongoing monitoring and support from a healthcare professional may be beneficial, and indeed required, for patients who are self-monitoring and up-titrating. Choice of antihypertensive medication was at the discretion of the prescribing GP, and any variations in clinical practice may have affected results. However, practitioners were provided with an algorithm summarising national clinical guidelines on the management of hypertension.

“Further research or retrospective analysis of existing trial data may provide useful additional information to inform guidelines on specific approaches to up-titration with medicines from antihypertensive drug classes, both alone and in combination.” – Dr Muhammad Jehangir Khan Bhatti, Public health Specialist Registrar, and Dr Arpana Verma, Senior Lecturer and Honorary Consultant in Public Health, Institute of Population Health, University of Manchester

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