

Is there a role for nurse-led blood pressure management in primary care?

Pippa Oakeshott, Sally Kerry, Angie Austin^a and Francesco Cappuccio

Oakeshott P, Kerry S, Austin A and Cappuccio F. Is there a role for nurse-led blood pressure management in primary care? *Family Practice* 2003; **20**: 469–473.

Adequate treatment of high blood pressure reduces the risk of strokes and other cardiovascular events, but current treatment in UK general practice is often inadequate. Nurse-led management of people with high blood pressure could lead to improvements due to strict adherence to protocols, agreed target blood pressure, better prescribing and compliance, and regular follow-up. However, a review of the literature shows a lack of robust evidence of the effectiveness of nurse-led hypertension management in primary care. There is a clear need for randomized controlled trials to see if nurse-led management is associated with better blood pressure control than routine care.

Keywords. Blood pressure, nurse-led management, primary care, review.

Introduction

Evidence of the benefit of antihypertensive treatment in people with high blood pressure is overwhelming. Effective treatment reduces risk of stroke by 40%¹ and of any cardiovascular event by 25%.² The benefits are greater in elderly people because they have a higher absolute risk of cardiovascular disease.³ It is estimated that while 168 young and middle-aged people with hypertension would need to be treated for 5 years to save one major fatal or non-fatal cardiovascular event, only 46 patients aged ≥ 60 years would need to be treated for the same benefit.⁴ Furthermore, research on isolated systolic hypertension in the elderly suggests that the number needed to treat for 5 years to prevent one major cardiovascular event in people aged ≥ 70 years is less than 20.² Reducing high blood pressure is therefore highly cost effective.

In the UK, around half the population aged >65 years has high blood pressure (defined as blood pressure $\geq 160/95$ mmHg), and 125 000 people suffer a stroke each year at a cost of £2.3 billion to the NHS and Social Services.⁵ Most strokes are not fatal, and the major burden of stroke is chronic disability. Even a small reduction

in incidence by improved blood pressure control would yield substantial cost savings.¹

Blood pressure management in UK general practice needs improvement

Most people with high blood pressure are managed in general practice. Unfortunately, quality of care is often inadequate. Since Tudor Hart's groundbreaking work in the 1970s,⁶ subsequent surveys have continued to show incomplete detection, treatment and control.^{4,7–10} Probably only about a quarter of hypertensive patients have their blood pressure adequately treated, and this has major implications for cardiovascular morbidity and mortality. For example, a large observational study from Merseyside of 6139 patients aged >65 years from 76 general practices found that only 64% of hypertensives were receiving treatment, of whom only 54% had a blood pressure of $<160/90$ mmHg (which is above current targets of 140/85 mmHg).¹¹ In addition, little attention has been given to blood pressure management among people from lower socio-economic groups¹ and those from ethnic minorities such as South Asians and people of African or Caribbean origin who have an increased risk of hypertension and diabetes.^{9,12} One UK primary care-based study found that although people of African origin were more likely to be on antihypertensive treatment, they were also more likely to have blood pressure levels above the guidelines.¹⁰ Interventions are needed to reduce such health inequalities.

Studies have examined obstacles to effective treatment of hypertension. Physician barriers include a willingness

Received 18 November 2002; Revised and Accepted 28 March 2003.

Department of General Practice and Primary Care, St George's Hospital Medical School, London SW17 0RE and ^aBattersea Research Group, Bolingbroke Hospital, London SW11 6HN, UK. Correspondence to Pippa Oakeshott; E-mail: oakeshot@sghms.ac.uk

to accept blood pressure outside national guidelines, reluctance to change or initiate treatment, workload and lack of resources to organize regular follow-up.^{13,14} Patient barriers include lack of knowledge about the risks of uncontrolled hypertension, poor compliance, loss to follow-up and cost of treatment.¹⁴

The British Hypertension Society, joint British recommendations and the National Service Framework for Coronary Heart Disease (CHD) have produced guidelines for the management of people with raised blood pressure.^{15–17} The aim is to lower absolute CHD risk, not just blood pressure, with the patient feeling well.^{3,18} Treatment should be effective, convenient and well tolerated.¹⁹ The major task in general practice is to apply the evidence.^{1,8}

Little research on nurse-led blood pressure management in primary care

Nurse-led management of people with high blood pressure could lead to improvements due to strict adherence to protocols, agreed target blood pressure, improved prescribing and compliance, and regular follow-up.^{20,21} In addition, most patients prefer general practice-based to hospital-based blood pressure care due to greater accessibility and continuity.¹³ However, as Ebrahim pointed out in 1998,¹ there is an urgent need for robust evidence for the effectiveness of nurse-led hypertension management in primary care.

In Spring 2002, we conducted a review of trials of nurse-led clinics in UK general practices which included some evaluation of blood pressure. We searched Medline, EMBASE, CINAHL, The Cochrane Library and UK HTA reports from 1990 to 2001. We also added trials identified from citations. Search terms used included hypertension, nursing and family practice. We selected studies to review if the setting was UK primary care, the interventions were conducted by nurses, and the studies were randomized controlled trials with a contemporaneous control group receiving no intervention.

Ten studies met all the inclusion criteria (Table 1).^{22–31} Their methodological quality in terms of the Jadad criteria³² of randomization, blinding and reports of losses to follow-up was generally good. However, the nature of a health promotion intervention meant patients could not be blind as to whether or not they received it, and it was often difficult for the outcome assessors to remain blind. Losses to follow-up were well documented in all but one study.²³

Most studies found that nurse-led management and cardiovascular health promotion without change in prescribing had little or no effect on blood pressure.^{22–31} In the only trial to show an important difference,³⁰ patients with blood pressure outside the guidelines were referred to their GP for drug treatment. However, this was a small trial ($n = 98$), and was of poorer methodological quality with unblinded outcome assessment by the cardiac liaison

nurse who conducted the intervention. Finally, since this review was completed, further analysis of the trial by Campbell and colleagues²⁷ has just been published.³³ This showed a greater improvement in the percentage of CHD patients with blood pressure managed according to British Hypertension Society guidelines after 1 year in practices with nurse-led secondary prevention clinics (adjusted odds ratio 5.32, 3.01–9.41).

Is there any evidence supporting nurse-led management?

Evidence suggesting potential benefits comes from trials of nurse-led management for smoking cessation,³⁴ non-primary care-based hypertension management²⁰ and cholesterol lowering.²¹ All showed significant improvement mainly due to rigorous application of national guidelines and increased or more appropriate use of medication. A Canadian trial in 457 untreated hypertensive patients aged 18–69 years compared worksite treatment of hypertension by specially trained nurses with care by GPs.²⁰ Patients in the nurse group were more likely to be put on antihypertensive treatment (95 versus 63%), to achieve agreed target blood pressure (49 versus 28%) and to take the drugs prescribed (68 versus 49%). Similarly, trained nurses were more likely than primary care physicians to achieve target low-density lipoprotein (LDL) cholesterol levels in siblings of individuals with premature CHD.²¹ This was due to increased pharmacotherapy and greater adherence to application of national guidelines. Finally, use of CHD risk charts by trained practice nurses and GPs in UK primary care was associated with a reduction in systolic blood pressure related to increased prescribing.³⁵

Conclusion

After initial evaluation and treatment, most hypertensive patients in primary care with well-controlled blood pressure do not need to see a doctor for routine blood pressure management. In line with government policy, there is an increasing role for trained practice nurses and nurse practitioners.⁸ Compared with general practice care, nurse-led care may benefit from more reliable blood pressure assessment, being more user friendly, accessible and less hurried, and improving understanding, encouraging healthy living and forming an alliance with the patient.^{36–38} However, the most important difference with current practice is likely to be due to improved anti-hypertensive prescribing, compliance with treatment and regular follow-up due to rigorous application of national guidelines. There is now a need for randomized controlled trials based in general practice to see if management of people with hypertension by specially trained practice nurses is associated with better blood pressure control than routine care.¹

TABLE 1 Randomized controlled trials from UK general practices of a nurse-led management intervention which included blood pressure (BP) evaluation

Reference	No. of practices	Participants	Intervention	Duration of trial	Quality score ^a	Difference in change from baseline systolic BP (mmHg)	Increase in antihypertensive prescribing	Comments
Jewell (1988) ²²	1	36 new or poorly controlled hypertensives aged 30–64	Nurse-led hypertension clinic with agreed treatment protocol versus a GP-led clinic	1 year	2	-8 (-25 to 9)	No data	Initial BP and subsequent reduction was lower in nurse-led clinic. At end of study, 67% in nurse group and 63% in GP group had diastolic blood pressure \leq 90
Robson (1989) ²³	1	3206 patients aged 30–64	Open access nurse-led health promotion clinic with computer-assisted follow-up versus GP care	2 years	2	No data	No data	Intervention patients more likely to have had BP recorded in the past 5 years (93 versus 73%).
ICRF OXCHECK Study Group (1994) ²⁴	5	6124 patients aged 35–64 invited for a health check	Nurse-led cardiovascular health promotion clinics with follow-up as agreed with patient versus usual care	1 year	3	3.2 (2.2–4.3) at follow-up	No data	Reduction in blood pressure may be due to accommodation
Cupples (1994) ²⁵	18	688 patients aged $<$ 75 with angina for 6 months	Advice re cardiovascular risk factors every 6 months from trained health visitor versus usual care	2 years	3	0.4 (-3.9 to 3.1)	No data	No effect on objective cardiovascular risk factors, but reported exercise and diet improved
Family Heart Study Group (1994) ²⁶	26	9348 patients (men aged 40–59 and their partners) invited for screening	Family-centred nurse-led cardiovascular health promotion clinics with regular follow-up for hypertensives and those at high cardiovascular risk versus usual care	1 year	3	7.6 (5.8–9.4) at follow-up	No difference	Half of actual reduction in systolic blood pressure likely to be due to accommodation. Such an intensive programme may not be cost effective
Campbell (1998) ²⁷	19	1173 patients aged $<$ 80 with CHD	Nurse-run clinics promoting medical and lifestyle aspects of secondary prevention	1 year	2	No data	No data	Small improvement in appropriate blood pressure management defined as $<$ 160/90 or on treatment or checked within last 3 months or referred to specialist
Steptoe (1999) ²⁸	20	883 patients with \geq 1 risk factor: smoking, cholesterol $>$ 6.5 or BMI $>$ 25 and no exercise	Brief behavioural counselling by trained practice nurses to reduce smoking and dietary fat intake and increase physical activity versus usual care	1 year	3	2.8 (-0.3 to 5.9)	No data	Behavioural counselling had no effect on hard outcomes: confirmed smoking cessation, serum cholesterol, BMI or diastolic blood pressure
SHIP Study Jolly (1999) ²⁹	67	597 patients with a new diagnosis of myocardial infarct or angina	Specialist liaison nurses encouraged general practice nurses to provide structured follow-up and preventive care	1 year	3	2.2 (-1.5 to 5.9) at follow-up	No difference	Intervention was effective in promoting follow-up but did not improve health outcome. Difficult for nurses to effect prescribing in some practices

TABLE 1 Continued

Reference	No. of practices	Participants	Intervention	Duration of trial	Quality score ^a	Difference in change from baseline systolic BP (mmHg)	Increase in antihypertensive prescribing	Comments
McHugh (2001) ³⁰	47	98 patients on waiting list for elective coronary artery bypass grafts	Nurse-led shared care programme to reduce cardiovascular risk factors. Monthly sessions with cardiac liaison nurse alternating with practice nurse. Patients with BP above target referred to GP for drug treatment	6 months	2	9.1 $P < 0.001$	No data	Unblinded assessment and same research nurse saw all intervention patients, so generalizability unclear
Moher (2001) ³¹	21	2142 patients aged 55–75 with established CHD	Nurse systematic recall compared with GP recall compared with audit	18 months	3	No difference at follow-up $P = 0.82$	No difference	Systematic recall improved assessment but not outcome. Follow-up by nurses was at least as effective as follow-up by doctors.

^a Methodological quality in terms of the Jadad criteria: randomization (and randomization method described), blinding, description of dropouts. Score 0–4.

References

- 1 Ebrahim S. Detection, Adherence and Control of Hypertension for the Prevention of Stroke: A Systematic Review. *Health Technol Assessment* 1998; **2**(11).
- 2 Staessen J, Gasowski J, Wang J *et al*. Risks of untreated and treated isolated systolic hypertension in the elderly: meta-analysis of outcome trials. *Lancet* 2000; **355**: 865–872.
- 3 Cappuccio FP, Antonies TFT. Lowering blood pressure in particular patient groups. *Drug and Therapeutics Bulletin* 2001; **39**: 37–40.
- 4 Mulrow CD, Cornell JA, Herrera CR, Kadri A, Farnett L, Aguilar C. Hypertension in the elderly. Implications and generalizability of randomized trials. *J Am Med Assoc* 1994; **272**: 1932–1938.
- 5 Rothwell PM. The high cost of not funding stroke research: a comparison with heart disease and cancer. *Lancet* 2001; **357**: 1612–1616.
- 6 Tudor Hart J. The management of high blood pressure in general practice. *J R Coll Gen Pract* 1975; **25**: 160–192.
- 7 Smith W, Lee A, Crombie I, Tunstall-Pedoe H. Control of blood pressure in Scotland: the rule of halves. *Br Med J* 1990; **300**: 981–983.
- 8 Ramsay L, Williams B, Johnston D *et al*. British Hypertension Society guidelines for hypertension management 1999: summary. *Br Med J* 1999; **319**: 630–635.
- 9 Primates P, Bost L, Poulter N. Blood pressure levels and hypertension status among ethnic groups in England. *J Hum Hypertens* 2000; **14**: 143–148.
- 10 Cappuccio FP, Cook DG, Atkinson RW, Strazzullo P. Prevalence, detection and management of cardiovascular risk factors in different ethnic groups in south London. *Heart* 1997; **78**: 555–563.
- 11 Cranney M, Barton S, Walley T. The management of hypertension in the elderly by general practitioners in Merseyside: the rule of halves revisited. *Br J Gen Pract* 1998; **48**: 1146–1150.
- 12 Cappuccio FP, Oakeshott P, Strazzullo P, Cook DG, Kerry SM. Application of CHD risk estimates to ethnic minorities and implications for the treatment of hypertension in primary care. *J Hum Hypertens* 2001; **15**: 907.
- 13 McGhee S, McInnes G, Hedley A, Murray T, Reid J. Coordinating and standardising long term care: evaluation of the west of Scotland shared-care scheme for hypertension. *Br J Gen Pract* 1994; **44**: 441–445.
- 14 Oliveira SA, Lapuerta P, McCarthy B, L'Italien G, Berlowitz D, Asch S. Physician-related barriers to the effective management of uncontrolled hypertension. *Arch Intern Med* 2002; **162**: 413–240.
- 15 Ramsay LE, Williams B, Johnston GD *et al*. Guidelines for the management of hypertension: report of the third working party of the British Hypertension Society. *J Hum Hypertens* 1999; **13**: 569–592.
- 16 British Cardiac Society, British Hyperlipidaemia Association, British Hypertension Society, British Diabetic Association. Joint British recommendations on prevention of coronary heart disease in clinical practice: summary. *Br Med J* 2000; **320**: 705–708.
- 17 Department of Health. *National Service Framework for Coronary Heart Disease*. Leeds (UK): DOH; 2000.
- 18 Padwal R, Straus S, McAlister F. Cardiovascular risk factors and their effects on the decision to treat hypertension: evidence based review. *Br Med J* 2001; **322**: 977–980.
- 19 Cappuccio FP, MacGregor GA. Combination therapy in hypertension. In Laragh J, Brenner B (eds) *Hypertension: Pathophysiology, Diagnosis and Management*. New York: Raven Press; 1995: 2969–2983.
- 20 Logan A, Milne B, Achber C, Campbell W, Haynes B. Work-site treatment of hypertension by specially trained nurses. *Lancet* 1979; **ii**: 1175–1178.
- 21 Becker D, Raqueno J, Yook R *et al*. Nurse-mediated cholesterol management compared with enhanced primary care in siblings of individuals with premature coronary disease. *Arch Intern Med* 1998; **158**: 1533–1539.
- 22 Jewell D, Hope J. Evaluation of a nurse-run hypertension clinic in general practice. *The Practitioner* 1988; **232**: 484–487.
- 23 Robson J, Boomla K, Fitzpatrick S *et al*. Using nurses for preventive activities with computer assisted follow up: randomised controlled trial. *Br Med J* 1989; **298**: 433–436.
- 24 Imperial Cancer Research Fund OXCHECK Study Group. Effectiveness of health checks conducted by nurse in primary care: results of the OXCHECK study after one year. *Br Med J* 1994; **308**: 308–312.
- 25 Cupples ME, McKnight A. Randomised controlled trial of health promotion in general practice for patients at high cardiovascular risk. *Br Med J* 1994; **309**: 993–996.
- 26 Family Heart Study Group. Randomised controlled trial evaluating cardiovascular screening and intervention in general practice: principal results of British family heart study. *Br Med J* 1994; **308**: 313–320.
- 27 Campbell N, Ritchie L, Thain J, Deans H, Rawles J, Squair J. Secondary prevention in coronary heart disease: a randomised trial of nurse led clinics in primary care. *Heart* 1998; **80**: 447–452.
- 28 Steptoe A, Doherty S, Rink E, Kerry S, Kendrick T, Hilton S. Behavioural counselling in general practice for the promotion of healthy behaviour among adults at increased risk of coronary heart disease: randomised trial. *Br Med J* 1999; **319**: 943–948.
- 29 Jolly K, Bradley F, Sharp S *et al*. Randomised controlled trial of follow up care in general practice of patients with myocardial infarction and angina: final results of the Southampton heart integrated care project (SHIP). *Br Med J* 1999; **318**: 706–711.
- 30 McHugh F, Lindsay GM, Hanlon P *et al*. Nurse led shared care for patients on the waiting list for coronary artery bypass surgery: a randomised controlled trial. *Heart* 2001; **86**: 317–323.
- 31 Moher M, Yudkin P, Wright L *et al*. Cluster randomised controlled trial to compare three methods of promoting secondary prevention of coronary heart disease in primary care. *Br Med J* 2001; **322**: 1–7.
- 32 Jadad AR, Moore A, Carroll D, Jenkinson C, Reynolds G, McQay HJ. Assessing the quality of reports of randomized clinical trials: is blinding necessary? *Controlled Clin Trials* 1996; **17**: 1–12.
- 33 Murchie P, Campbell N, Ritchie L, Simpson J, Thain J. Secondary prevention clinics for coronary heart disease: four year follow up of a randomised controlled trial in primary care. *Br Med J* 2003; **326**: 84–87.
- 34 Rice VH and Stead LF. *Nursing Interventions for Smoking Cessation (Cochrane Review)*. Oxford: The Cochrane Library; Issue 1. 2002.
- 35 Montgomery A, Fahey T, Peters T, MacIntosh C, Sharp D. Evaluation of computer based clinical decision support system and risk chart for management of hypertension in primary care: randomised controlled trial. *Br Med J* 2000; **320**: 686–690.
- 36 Austin A, Oakeshott P, King S. Shared decision making in hypertension. *Fam Pract* 2002; **19**: 310.
- 37 Beevers M. The role of nurses in the management of hypertension. *Mod Hypertens Manag* 2000; **2**: 11–13.
- 38 Ketola E, Makela M, Klockars M. Individualised multifactorial lifestyle intervention trial for high risk cardiovascular patients in primary care. *Br J Gen Pract* 2001; **51**: 291–294.