

Research papers

Hypertension and the older patient in general practice. A comparison of process and outcome for patients on multiple therapies at two practices

Moyez Jiwa MRCGP MA MD

Lead Lecturer for Clinical Research, Institute of General Practice and Primary Care, SchARR, University of Sheffield, UK

Katie McGowan

Medical Student, University of Sheffield, UK

Michael Gordon BMed Sci BMBS DRCOG

General Practitioner, Gleadless Medical Centre, Sheffield, UK

Jenny Freeman MSc PhD

Lecturer in Medical Statistics, The University of Sheffield, Institute of Primary Care and General Practice, Community Science Centre, Northern General Hospital, Sheffield, UK

ABSTRACT

Background There are now many perceived benefits of polypharmacy in the management of hypertension. With surveys reporting inadequate blood pressure control there are calls for more aggressive management particularly in relation to the older patient. However, because of the physiological changes of ageing, the risks of polypharmacy are substantial in this group and may undermine efforts to prescribe multiple therapy.

Aim To quantify and compare documented efforts to manage hypertension in patients over 75 years of age, treated with multiple agents over a three-year period at two UK general practices.

Methods We conducted a retrospective review of computerised and paper medical records. Health records were examined ($n = 192$) for patients aged 75–80 years registered over three years at two South Yorkshire practices. Included patients had to have been taking therapy for high blood pressure since at least October 2000 and been managed on at least two different prescribed drugs. The most recently recorded blood pressure readings before October 2003 were noted. The number of agents and doses throughout the three-year period were recorded. Biochemical and physical side-effects recorded in

the notes were included in the analysis. Therapeutic manoeuvres, patient concordance and consultations where blood pressure was taken were recorded.

Results Both practices recorded similar efforts to manage hypertension in this age group. There were small differences in clinical practice, though the end-point measurement – proportion of cases with normal blood pressure after three years – was no different between the practices (42% vs. 36%). In general, concordance was noted to be greater in patients who were normotensive by the end of three years. However, logistic regression analysis fitting hypertension at the end of three years as the outcome variable, and general practitioner recording of blood pressure, number of treatment manoeuvres, number of investigations and concordance as explanatory variables failed to demonstrate that any of these factors are useful predictors of a normal blood pressure after three years ($r^2 = 0.09$).

Discussion We found that these two practices successfully treated 60% of their older hypertensive patients when using two or more classes of therapy by a defined date at the end of a three-year period. Patients who do not request repeat prescriptions for treatment are more likely to remain hypertensive.

However, the data do not suggest that a greater proportion of patients prescribed more than two classes of drugs are more successfully treated than those on two, or that patients taking more classes of drugs had more side-effects.

Keywords: hypertension, older patient, primary care, polypharmacy

Introduction

Untreated hypertension poses a greater risk to the older than younger patient and antihypertensive treatment is more cost-effective in the elderly population up to 80 years of age.¹⁻³ Emariou *et al* temper the zeal for antihypertensive therapy pointing out that hypertension should be controlled without adverse side-effects on the functional wellbeing of patients.⁴ Other views vary from those who perceive dangers in increasing levels of medication to those who maintain that effective drug therapy need not compromise quality of life.^{5,6} Tailoring antihypertensive therapy is challenging within the context of physiological ageing and the high incidence of degenerative pathology. Drugs with a convenient dosing schedule, minimal side-effects, and without an adverse impact on comorbid conditions are important considerations in the treatment of hypertension in the older patient.⁷ These issues come into sharp focus in cases where therapy necessitates multiple agents.⁸

It is now common to manage hypertension using multiple drugs at a low dose rather than depending on monotherapy at a high dose. Multiple drug therapy offers not only the possibility of greater therapeutic efficacy but also the possibility of reduced incidence of side-effects through complementary actions.⁹ The treatment of hypertension in older people in UK primary care has improved in terms of detection and treatment but only one-third of patients are high blood pressure controlled.¹⁰ Rendering patients normotensive requires the application of common sense to any treatment decision.¹¹ This study aims to quantify and compare documented efforts in two UK general practices to manage

hypertension in patients over 75 years of age treated with multiple drugs by a defined date over a three-year period.

Setting

Two practices, members of the North Trent Research Alliance, a primary care research network, were invited to take part in a retrospective survey of patient records. No formal selection of practices was applied. The demographic characteristics of the two practices are shown in Table 1. Both practices were fully computerised operating an Egton Medical Information System (EMIS) clinical system.

Methods

Hypertension was defined according to the British Hypertension Society Guidelines 1999.¹² Their suggested audit standard, representing the minimum acceptable level of control, i.e. 150/90 mmHg, was adopted in the study. Clinical records for patients aged 75–80 years, coded for 'essential hypertension' on the practice computer were included in the study group. Record entries covering a period of three years from October 2000 to October 2003 were examined. A search was also carried out for patients on antihypertensive therapy who were not coded for 'essential hypertension' but were treated for hypertension. These additional hypertensive patients were included. Computer records were validated by simultaneous review of paper records. A medical student (KW)

Table 1 Demographic characteristics of practices

Characteristic	Practice A	Practice B
List size	10 500	8600
Number of GP partners (whole time equivalents)	6.5	6
Percentage of patients over 75 years of age	7.8	7.7

undertook the data extraction in accordance with the data protection act.¹³ Inclusion and exclusion criteria are shown in Box 1.

Data collected

Agents

- The number of different classes of antihypertensive agents prescribed at October 2000 and at October 2003.
- For each agent prescribed at October 2003 the current dose and whether this is the maximum dose recommended by the *British National Formulary* (BNF) or tolerated without adverse effects according to entries in the records.
- The number of months each agent has been taken prior to October 2003.
- Biochemical and physical adverse events recorded in the notes.

Therapeutic manoeuvres

We defined four possible manoeuvres with respect to the antihypertensive drugs:

- commencement
- cessation
- switching to another class of therapy
- change of dose.

Concordance

Concordance was defined by a proxy measure: computer evidence that prescriptions for antihypertensive drugs had been issued (and by corollary requested) in the three months leading up to 1 October 2003.

Blood pressure-related consultations

These were defined as a consultation at which blood pressure had been recorded and were subdivided, according to location and healthcare worker, general practitioner (GP) at the practice, GP on a home visit, district nurse, practice nurse or healthcare assistant.

Investigations

Data were collected about the number of investigations ordered by the practice in relation to the

monitoring of hypertension and therapy. The investigations included urea and electrolytes, lipids, liver function tests, blood glucose and ECG.

The data were analysed using SPSS version 11. Descriptive statistics and non-parametric test results are presented as appropriate. Differences between those remaining hypertensive and those classed as normotensive were examined using logistic regression analysis, with GP recoding of blood pressure, number of treatment manoeuvres, number of investigations and concordance fitted as explanatory variables.

Results

A total of 471 records relating to older hypertensive patients were examined. However, many did not satisfy the other inclusion criteria. After exclusions, 192 records were eligible for the review and of these 40% remained hypertensive ($\geq 150/ \geq 90$ mmHg) at the end of the study.

Management of patients

GPs in practice A were more likely to record the blood pressure at the surgery whereas district nurses at practice B were more likely to have recorded blood pressure. Overall there was no difference in the number of treatment manoeuvres performed at each practice although patients were more likely to have had an ECG recorded in practice B. No other significant difference in any other factor relating to diagnosis, investigation or treatment was recorded (see Table 2).

Outcomes of treatment between the practices

There was no significant difference between the practices in terms of the proportion of patients on more than two agents (35% in Practice A, 44% in Practice B, $P = 0.2$), nor did the practices differ in the proportion of patients who remained hypertensive at October 2003 (36% in Practice A, 42% in Practice B, $P = 0.39$). However, a significantly higher proportion of patients

Box 1 Inclusion and exclusion criteria

Inclusion criteria

- Age 75–80 years
- Noted to have high blood pressure at October 2000
- Registered with the index practice in Oct 2000
- Simultaneously treated with two or more classes of therapy

Exclusion criteria

- Terminally ill patients
- Patients under review by a hospital hypertension clinic or hospital medical clinic because of their hypertension

Table 2 Differences between practices in relation to the monitoring, diagnosis and management of patients

Variable	Practice A		Practice B		<i>P</i> -value for difference between groups*
	<i>n</i>	Median (IQR)	<i>n</i>	Median (IQR)	
Number of treatment manoeuvres	266	3 (4)	340	2 (4)	0.41
Number of times blood pressure recorded by GP in surgery	484	5 (5.25)	817	7 (5)	0.01
Number of times blood pressure recorded by district nurse	43	0 (1)	17	0 (0)	<0.001
Number of ECGs	31	0 (1)	15	0 (0)	0.01

* Mann–Whitney *U* test
IQR: interquartile range

at Practice B were shown to be concordant (7.5% in Practice A, 46.5% in Practice B, $P < 0.001$, Table 3).

Concordance and management of hypertensives at 2003 compared to normotensives at 2003

Concordance was higher among those who had a normal pressure; 44/116 (38%) vs. 15/76 (20%), chi-squared test $P = 0.008$, difference 18%, 95% confidence intervals (CI) 5–30%. There were no other marked differences other than that patients with hypertension had suffered more side-effects (see Table 4).

Management and outcomes of treatment according to number of classes of treatment

Patients prescribed more than two classes of drugs were *not* more likely to be successfully treated than patients on only two classes of drugs, 44/77 (57%) vs. 72/115 (62%), chi-squared test, $P = 0.45$. However, patients on more than two different classes of anti-hypertensive were significantly more likely to be concordant with treatment (38/77 (49%) vs. 21/115 (18%), $P < 0.001$, chi-squared test, difference 31%, 95% CI 18–44%. Other differences between those on two and more than two classes of therapy are shown in Table 5.

Table 3 Outcomes at October 2003

	Practice A (<i>n</i> = 78)	Practice B (<i>n</i> = 114)	Difference (95% CI)	<i>P</i> -value*
Patients on more than two agents (%)	35	44	9.2 (4.9–22.5)	n.s.
Hypertensive patients (%)	36	42	6 (7.9–19.6)	n.s.
Concordant patients (%)	7.5	46.5	39 (27–49)	<0.001

*Chi-squared test
n.s. not significant

Table 4 Differences between patients who remained hypertensive in October 2003 compared with others

Variable	Hypertensive		Normotensive		<i>P</i> -value for difference between groups*
	<i>n</i>	Median (IQR)	<i>n</i>	Median (IQR)	
Number of treatment manoeuvres	275	7 (5)	331	2 (3)	0.07
Number of times blood pressure recorded by GP in surgery	547	6.5 (6)	754	6 (4.8)	n.s.
Number of times blood pressure recorded by practice nurse	152	1 (3)	244	1 (3)	n.s.
Number of classes of medication	199	2 (1)	280	2 (1)	n.s.
Side-effects of medication	54	0 (1)	49	0 (1)	0.01
Number of investigations	554	5 (8)	900	7 (7)	n.s.

* Mann-Whitney *U* test
n.s. not significant

Finally stepwise logistic regression analysis was performed fitting hypertension on 1 October 2003 as the outcome variable and predictor variables including GP recording of blood pressure, number of treatment manoeuvres, number of investigations, and concordance. None of these variables were shown to be significant predictors of outcome following three years of treatment.

Discussion

Summary of findings

We found that these two practices successfully treated 60% of their older hypertensive patients when using two or more classes of antihypertensive medication over a three-year period. This is a greater proportion than reported in previous studies, which included all patients.¹¹ Neither practice could boast a significantly greater proportion of normotensive patients despite some differences in management of cases. It was not possible to determine the factors that helped to reduce

blood pressure to within the normal range. Patients having more therapeutic manoeuvres were not significantly more likely to suffer side-effects nor to require more investigations. There was insufficient evidence that patients prescribed more than two classes of medication were more successfully treated than patients only treated with two. Patients who were shown to be concordant using the proxy measures in this study were more likely to have a normal blood pressure after three years. However, despite greater concordance with treatment, the group taking a larger number of classes of therapy could not be shown to have a lower blood pressure.

Comment

Patients using more than two classes of therapy had more treatment manoeuvres and were more likely to be concordant. Both practices had a similar proportion of patients in this category. It is not apparent from these data why such patients were selected for a greater effort. Previous work from this locality suggests that doctors and patients choose to avoid polypharmacy or dose changes.¹⁴ There was some evidence that patients

Table 5 Patients taking more than two different classes of antihypertensive compared with others

	Number of classes of therapy				<i>P</i> -value for difference between groups*
	Two		More than two		
	<i>n</i>	Median (IQR)	<i>n</i>	Median (IQR)	
Number of treatment manoeuvres per patient	284	2 (4)	322	4 (5)	0.001
Number of times blood pressure recorded by GP in surgery per patient	651	5 (5)	650	8 (6)	0.01
Side-effects of medication	51	0 (1)	52	0 (1)	n.s.
Number of investigations	796	6 (6)	658	7 (9.5)	0.09

* Mann-Whitney *U* test
n.s. not significant

who remained hypertensive had suffered more side-effects and this suggests at least one reason why such patients and their doctors may have been reticent to initiate further therapy.

Strengths and weaknesses

The demographic characteristics of these practices may be typical of general practice in the locality. Some variation in clinical practice is also apparent and this may similarly reflect the reality in practice. However, one hesitates to make generalisations based on a retrospective survey of medical records from two practices. There may be other differences in approach to the management of hypertensive patients that remain undetected by a simple survey of patient records. We did not have the scope to attempt to validate data on concordance by interviewing patients or confirming that prescriptions had been dispensed at a pharmacy, nor was it possible to analyse outcomes based on the type of drugs used in practice. A large number of agents were prescribed with a large number of possible combinations. It is also possible that some patients on multiple therapies may respond in time and a longer period of review is appropriate.

Conclusions

This retrospective review of patient records suggests that two geographically separate practices are equally successful in managing hypertension in their older patients. There appears to be limited scope to reduce blood pressure for patients on three or more drugs. Despite more treatment manoeuvres and greater monitoring of blood pressure, these patients were not significantly more likely to be normotensive in this review of case records. The data suggest that patients taking only two agents and remaining hypertensive might be targeted for further therapeutic measures and a further 20% of these patients rendered normotensive.

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ADDRESS FOR CORRESPONDENCE

Dr Moyez Jiwa, Institute for General Practice and Primary Care, ScHARR, University of Sheffield, Community Sciences Centre, Northern General Hospital, Sheffield S5 7AU, UK. Tel: +44 (0)114 271 5561; fax: +44 (0)114 242 2136; email: m.jiwa@sheffield.ac.uk

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