

Hypertension guideline adherence of private practitioners and primary health care physicians in Pretoria

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Abstract

Background: Hypertension remains a healthcare problem in South Africa. When prescribing evidence-based, cost-effective anti-hypertensive treatment, guideline adherence is essential. The Joint National Committee's Sixth Report (JNC VI) built its evidence-based review on the outcome of clinical trials. The objective of this study was to assess the hypertension guideline adherence of general practitioners in private practice and of primary health care physicians in an academic government hospital setup in Pretoria, using the JNC VI guidelines.

Methods: A survey was conducted on a random sample of 240 general practitioners in Pretoria and on 35 primary health care physicians working in the outpatient departments of the Pretoria Academic, Kalafong and Mamelodi hospitals.

Results: The survey showed that private practitioners and primary health care physicians do not follow the JNC VI guidelines when treating hypertensive patients. Physicians in both study populations do not adhere to the guidelines when treating hypertensive patients with isolated systolic hypertension (ISH), previous myocardial infarction (MI) and renal disease. Even so, most doctors correctly prescribe angiotensin-converting enzyme (ACE) inhibitors when treating congestive cardiac failure (CCF) and diabetic nephropathy.

Conclusions: This study indicates the need to educate physicians in both private and public setup regarding the value of prescribing cost-effective anti-hypertensive medication, based on evidence from clinical trials.

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Introduction

Hypertension is one of the major diseases in South Africa.¹ Health care costs and medical insurance payments are high and increasing, and lifelong treatment, especially with the newer anti-hypertensive drugs, could prove very expensive.¹ It is therefore important that health care providers in both public and private setup follow guidelines when prescribing anti-hypertensive treatment, focusing on evidence-based cost-effective treatment.^{1, 2}

The JNC VI, published in 1997, built its evidence-based review on knowledge from clinical trials and represents a consensus of expert opinion where evidence is lacking.³⁻⁵ The JNC VI report did not formally consider cost when recommending treatment guidelines, but a previous analysis suggested that low dose diuretics as the recommended first line of treatment for uncomplicated hypertension also proved to be the

most cost effective.⁶

Studies on the prescribing patterns of health care physicians have shown that some physicians lack detailed knowledge of hypertension guidelines and tend to prescribe more expensive drugs without evidence of efficacy.^{1,4,5} Currently available studies on guideline adherence in hypertension have been done on private practitioners, internal physicians and cardiologists, in either a public or a private setup, but to the best of my knowledge no survey has been done on primary care physicians in both private and public setups in Pretoria.^{1-5,7,8}

The principle aim of this study was to assess the hypertension guideline adherence of general practitioners in private practice and in an academic government hospital setting in Pretoria. The JNC VI report, published in 1997, was used as the treatment guideline.⁹

The survey also assessed the most prescribed generic drug in each anti-hypertensive drug group.

Method

Study population

A survey was conducted among general practitioners in private practice and primary health care physicians in academic government hospitals in Pretoria. The subjects were selected as being the most likely to treat hypertensive patients in this area. In August 2002, a list of the 2 470 registered medical practitioners in Pretoria was obtained from the Health Professions Council of South Africa. A random sample of 240 general practitioners was selected from this list, using a randomisation list supplied by the Department of Statistics, University of Pretoria. Randomised names and addresses were cross-checked using the 2002-2003 Pretoria telephone directory, confirming the subjects to be in private practice. The sample of 240 made provision for non-response and thus presented an over-sample. The second sample comprised the 35 primary health care

Table I: Knowledge regarding the definition of hypertension.

Question	Correct answer	% Private practitioners (n = 73)	% Public health care physicians (n = 35)
Definition of hypertension	BP >140/>90 mmHg	60.3	76.5
Definition of ISH	SBP >140 and DBP <90 mmHg	16.4	17.7

BP = blood pressure, ISH = isolated systolic hypertension, SBP = systolic blood pressure, DBP = diastolic blood pressure

Table II: Anti-hypertensive treatment choices in co-morbid conditions

Co-morbid condition	Most appropriate anti-hypertensive drug group	Private practitioners (%) (n = 73)	Public health care physicians (%) (n = 35)	p-value with Fisher's Exact Test
Post MI + AF	Beta blocker	57.1	73.5	0.13
Diabetic nephropathy	ACE inhibitor	85.9	73.5	0.17
Congestive cardiac failure	ACE inhibitor	68.5	74.3	0.65
Angina, excluding beta-blockers and nitrates	Calcium channel blocker	21.5	38.2	0.11
Pregnant female (newly diagnosed)	Central-acting alpha-2 agonist	64.6	75.0	0.35
Isolated systolic hypertension	Low-dose thiazide diuretic	60.9	58.8	1.00
Left ventricular dysfunction (excluding ACE inhibitors)	Angiotensin II antagonist	59.7	50.0	0.40
Renal insufficiency	ACE inhibitor	54.9	34.3	0.06

Table III: Most prescribed oral anti-hypertensive drug in each proposed clinical scenario.

Co-morbid condition	Anti-hypertensive agent	Respondents (%) (n = 108)
Post MI + AF	atenolol	35.6
Diabetic nephropathy	perindopril	46.5
Congestive cardiac failure	perindopril	48.6
Angina, excluding beta-blockers and nitrates	amlodipine	26.1
Pregnant female (newly diagnosed)	methyldopa	81.7
Isolated systolic hypertension	hydrochlorothiazide	38.2
Left ventricular dysfunction (excluding ACE inhibitors)	lorsartan	27.8
Renal insufficiency	perindopril	21.6

MI = myocardial infarction, AF = atrial fibrillation, ACE = angiotensin-converting enzyme

Table IV: Mean percentage correct answers and mean year qualified in each group

	General practitioners (n = 66)	Primary health care physicians (n = 32)
Mean % correct	55.0	56.4
Mean year qualified	1985	1990

Due to missing values, this analysis was calculated using 98 observations.
Mean percentage correct answers = total amount of correct answers/total amount of questions answered

physicians working in the outpatient departments of Kalafong, Pretoria Academic and Mamelodi hospitals. All 35 primary health care physicians in the government hospitals were included in the study to make provision for non-response and the small population size.

Questionnaire

A questionnaire was compiled to assess the general practitioners' basic knowledge of hypertension guidelines as recommended by the JNC VI report. The questionnaire contained 10

multiple-choice questions. Two questions tested the subjects' knowledge of the definitions of hypertension and isolated systolic hypertension respectively. Eight questions assessed the physicians' initial choice of anti-hypertensive drug class in specific clinical scenarios. In each of these eight questions, the participant was also asked to name his/her most prescribed drug in the chosen drug class. Demographic data, such as year of medical qualification and the country the qualification was obtained in, were requested. No

reference was made to any published hypertension guidelines.

The Ethics Committee of the Pretoria Academic Hospital Complex approved the questionnaire on 3 February 2003.

A survey package containing a letter of introduction, the questionnaire, as well as a postage-paid return envelope, was posted to the randomised private practitioners on 1 May 2003. All subjects were contacted telephonically after one month. A second survey package, containing a reminder letter and a postage-paid return envelope, was mailed to all the private practitioners on 1 June 2003. A representative of the Department of Family Medicine of the University of Pretoria handed questionnaires to all primary health care physicians working in the outpatient departments of Kalafong, Pretoria Academic and Mamelodi hospitals. The study ended

on 1 July 2003. All questionnaires were anonymous and non-responders were not replaced.

Statistics

The percentage of respondents in each of the two sample groups was calculated. One point was awarded for each correct answer. Guideline adherence was considered adequate when seven out of 10 questions were answered correctly. The demographic data were analysed, and the most prescribed drug in each drug class group was calculated. The Likelihood Ratio Chi-Square and Fisher's Exact tests were used to compare guideline adherence in the two sample groups. Statistical significance was viewed as $p < 0.05$.

RESULTS

Response rate

A total of 73 out of the 240 (30.4%) randomly selected private practitioners responded to the survey. All 35 (100%) of the outpatient health care physicians in the academic government hospital setup responded. In total, 108 evaluable questionnaires were received.

Definition of hypertension

When asked to "Give the current definition of hypertension", 65.4% of the respondents correctly chose $>140/>90$ mmHg. When asked to "Give the definition of isolated systolic hypertension (ISH)", only 16.8% of the respondents correctly chose SBP (systolic blood pressure) >140 mmHg and DBP (diastolic blood pressure) < 90 mmHg. See Table I for the responses of each study group.

Anti-hypertensive treatment in co-morbid conditions

(See Table II for a breakdown of the responses of the two study populations.)

In response to the question, "Name initial choice of anti-hypertensive drug in a post-myocardial infarction (MI) patient with hypertension and atrial fibrillation", 62.5% of the respondents correctly selected beta-blockers, while

21.2% selected an ACE inhibitor.

An ACE inhibitor was correctly selected by 81.9% of the respondents in response to the question "Select initial drug choice in patients with hypertension and diabetic nephropathy". Most respondents (70.4%) correctly chose ACE inhibitors as the drug of choice in patients with hypertension complicated by congestive cardiac failure (CCF).

Only 27.3% of all participants correctly chose a nondihydropyridine calcium-channel blocker (CCB) as a choice when treating a hypertensive patient with angina unresponsive to beta-blockers and nitrates. Most respondents (41.4%) chose a dihydropyridine calcium-channel blocker, and 22.2% of the respondents selected an ACE inhibitor.

In response to the question, "Name oral drug choice when treating a pregnant female with newly diagnosed hypertension", 68.4% of the respondents correctly chose a central-acting alpha-2 agonist.

Most participants (60.2%) were correct in selecting a low-dose thiazide diuretic when treating isolated systolic hypertension.

In treating a patient with left ventricular dysfunction and ACE inhibitor intolerance, 56.6% of the respondents correctly chose an angiotensin II antagonist.

An ACE inhibitor was correctly selected by 48.1% of the respondents as the treatment choice in a hypertensive patient with renal insufficiency, while 21.7% chose a low dose thiazide diuretic.

For each clinical scenario, the respondents named their most prescribed drug in the chosen anti-hypertensive drug class. The results are presented in Table III.

All the participants qualified in South Africa. See Table IV for the mean percentage of correct answers and their correlation with the year of qualification.

Only 27.8% ($p < 0.0001$) of the respondents answered seven or more questions correctly, and 69.44% of all the participating medical doctors

received more than 50% ($p < 0.0001$) for the questionnaire. More primary health care physicians (40%; $p = 0.23$) than general practitioners (21.9%; $p < 0.0001$) had more than seven answers correct. When comparing the guideline adherence of the two groups, the Likelihood Ratio Chi-Square test ($p = 0.053$), and Fisher's Exact tests ($p = 0.066$) suggested, but did not conclude, a significant difference. This might have been more significant had the public setup sample size been larger. No participant scored 100% for the questionnaire.

Discussion

This survey showed that general practitioners in private practice and primary health care physicians in the three academic hospitals in Pretoria did not adhere to the hypertension guidelines suggested by the JNC VI report. It is important to note that the results of the ALLHAT study (December 2002), as well as the new JNC 7 report (21 May 2003) were published at the time of this survey, which might have influenced some of the answers of the questionnaire.^{11,12} However, the guidelines suggested by the JNC VI report will be used for the purposes of the study and reference will be made to any new information.

Several trials proved diuretics to be superior in the prevention of cardiovascular morbidity and mortality associated with hypertension.⁹⁻¹⁴ The JNC VI and 7 reports recommend diuretics to be used as first-line anti-hypertensive drug in the treatment of uncomplicated hypertension and ISH.^{9,11} Despite this, nearly 40% of all the participants in the study preferred other anti-hypertensive drugs in the treatment of ISH, which suggests that diuretics still remain underused in the treatment of hypertension.

The JNC VI and 7 reports specify compelling indications and co-morbidities that justify the use of specific anti-hypertensive drug treatments, using evidence from previous clinical trials.^{9,11} For example, the benefit of treating patients with

acute coronary syndrome with beta-blockers has been proven, but only 62.5% of all respondents chose to prescribe these drugs to a patient with a previous MI complicated by atrial fibrillation.^{4,9,10} Furthermore, 14.4% of the doctors chose calcium channel blockers as their first choice in treating post-MI patients, even though this is not recommended by either report.^{9,11}

Both JNC reports recommend that, unless contraindicated, patients with diabetic and non-diabetic renal disease should receive an ACE inhibitor to inhibit disease progression.^{9,11,15} While more than 80% of the participants prescribe these drugs to patients with diabetic nephropathy, only 48% of the respondents prescribe ACE inhibitors for patients with mild renal insufficiency.⁹⁻¹¹

Another compelling indication for the use of ACE inhibitors is CCF.⁹⁻¹¹ It has been proven that drugs from this drug class significantly reduce morbidity and mortality in patients with heart failure.^{9-11,16} Most respondents (70.4%) followed this recommendation.

The JNC VI report suggests that angiotensin II antagonists should be used in some co-morbid conditions when ACE inhibitors are indicated but not tolerated.⁹ Only 56.6% of the respondents prefer Angiotensin II antagonists when treating left ventricular dysfunction in a hypertensive patient with ACE inhibitor intolerance.

The majority of respondents knew the definition of hypertension, though 20.6% of the physicians diagnosed hypertension as BP >130/>85 mmHg, which is classified as "high-normal" in the JNC VI report. However, the largest group of participants (44.7%) incorrectly defined ISH as SBP >160 mmHg and DBP <90 mmHg.

Due to the small population of participating doctors in the government hospital setup, the main purpose of this survey was not to compare the two study populations. Even so, there seems to be no significant difference between the choice of answer to each question, as

well as the mean percentage of correct answers, in the two study populations. Also, the year of qualification seemed to have no effect on the mean percentage of correct answers (see Table IV).

Limitations

The size of the study population of both groups is very small, which could make the percentages misleading. New guidelines have recently been implemented that might change old perspectives. There seems to be a difference in guideline adherence (>70% for correct answers) between the two study groups, but this could be misleading, as this calculation was done without taking missing values into account. Also, the questions were asked in broad way, which might be interpreted differently in a clinical setup.

Conclusions

This survey suggested that physicians in private and public practice do not adhere to guidelines when prescribing anti-hypertensive medication. Diuretics are still underused when initiating anti-hypertensive treatment, but most physicians adhere to guidelines when treating a hypertensive patient with CCF, ischaemic heart disease and diabetic nephropathy. Future studies on large sample sizes, representing both general practitioners and public doctors, before and after a degree of intervention (e.g. conference on hypertension guidelines) might prove more valuable. ♡

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