Management of hypertension in primary care

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ABSTRACT

Background

The European Society of Cardiology and the European Society of Hypertension define hypertension as systolic blood pressure ≥140 mmHg Hg, or diastolic blood pressure ≥90 mmHg Hg, or both. Hypertension is a challenging condition in view of it being asymptomatic, highly prevalent and requiring continuous follow-up by the family physician.

Objective

To implement the available guidelines into clinical practice for better patient health.

Method

Multiple databases were used to perform the literature search including PubMed, National Institute of Clinical Excellence, Scottish Intercollegiate Guidelines Network, and the Turning Research Into Practice database. The following keywords were applied: hypertension, blood pressure, and primary care.

Results

Blood pressure needs to be measured by a device which is regularly calibrated. This could be a traditional mercury sphygmomanometer, aneroid sphygmomanometer or the automated sphygmomanometer. The cuff size should be adjusted according to the patient's arm circumference and the patient should be seated comfortably with the arm rested such that the cuff is at the same level as the heart. During the initial assessment, the blood pressure should be measured in both arms and then the arm with the highest reading is used for subsequent measurements. Ambulatory blood pressure monitoring should be offered if the blood pressure is found to be over 140/90mmHg (measured at least twice) during the initial assessment.

Conclusion

Appropriate management of hypertension will contribute significantly towards an improvement in overall patient health.

Key words: hypertension, blood pressure, primary care.

INTRODUCTION

In the latest guidelines issued by the European Society of Cardiology (ESC) and the European Society of Hypertension (ESH), hypertension is defined as office systolic blood pressure values ≥140 mmHg and/or diastolic BP (DBP) values ≥90 mmHg (Williams, et al., 2018). The incidence of hypertension increases with age and Afro-Caribbeans have a higher prevalence of hypertension as shown by various epidemiological studies (Burt, et al., 1995). Hypertension is a challenging condition since it is often asymptomatic, its prevalence is very high and requires continuous follow-up by the family physician. Hence, cardiovascular risk assessments (Franklin, et al., 2005) are very useful for primary prevention particularly in asymptomatic patients in the general population. The aim of this article is to be able to implement the available guidelines into clinical practice for better patient health.

METHOD

The searches were performed during the month of August 2018 using multiple databases including PubMed, National Institute of Clinical Excellence (NICE), Scottish Intercollegiate Guidelines Network (SIGN), and the TRIP (Turning Research Into Practice) database. The MeSH (Medical Subject Headings) terms applied were: hypertension, blood pressure, and primary care. The following search parameters were used for the literature search:

- Scope: management of hypertension.
- Population: adults.
- Exclusions: none.

RESULTS

Blood pressure can be measured using the traditional mercury sphygmomanometer, aneroid sphygmomanometer or the automated sphygmomanometer which is becoming increasingly popular. Guidelines issued by the British Hypertension Society (BHS) in 2017 and the National Institute for Health and Clinical Excellence in 2016 recommend that every device should be regularly calibrated. The cuff size used should be adjusted according to the patient's arm circumference. If the cuff size is too small, blood pressure may be overestimated whereas if it is too large, there may be an underestimation. The patient should be seated comfortably with the arm rested such that the cuff is at the same level as the heart. During the initial assessment, one should measure the blood pressure in both arms and then use the arm with the highest reading for subsequent measurements. A difference of up to 10 mmHg is acceptable. However, if there is a difference of 20 mm Hg or more in systolic blood pressure between the two arms, the physician should suggest that the patient be investigated for peripheral vascular disease (Clark, 2001).

If the blood pressure is found to be over 140/90mmHg (measured at least twice) during the initial assessment, one should offer 24-hour ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) if ABPM is not tolerated (Figure 1). One should also consider the possibility of white-coat hypertension in patients who are noted to be anxious when a clinician is measuring their blood pressure. For such patients, ABPM or HBPM should also be considered. When the blood pressure is found to be ≥180/110 mmHg (even when repeated a second time with the patient resting for five minutes), in the absence of any signs of malignant hypertension, antihypertensive treatment should be started straight away and the patient is reviewed regularly until the blood pressure is controlled (NICE, 2016.)

The National Institute for Health and Clinical Excellence, in the latest guidelines on the clinical management of primary hypertension in adults (last updated in 2016) recommends that patients should be referred to specialist care the same day in the presence of accelerated hypertension (i.e. blood pressure usually higher than 180/110 mmHg) with papilloedema and/
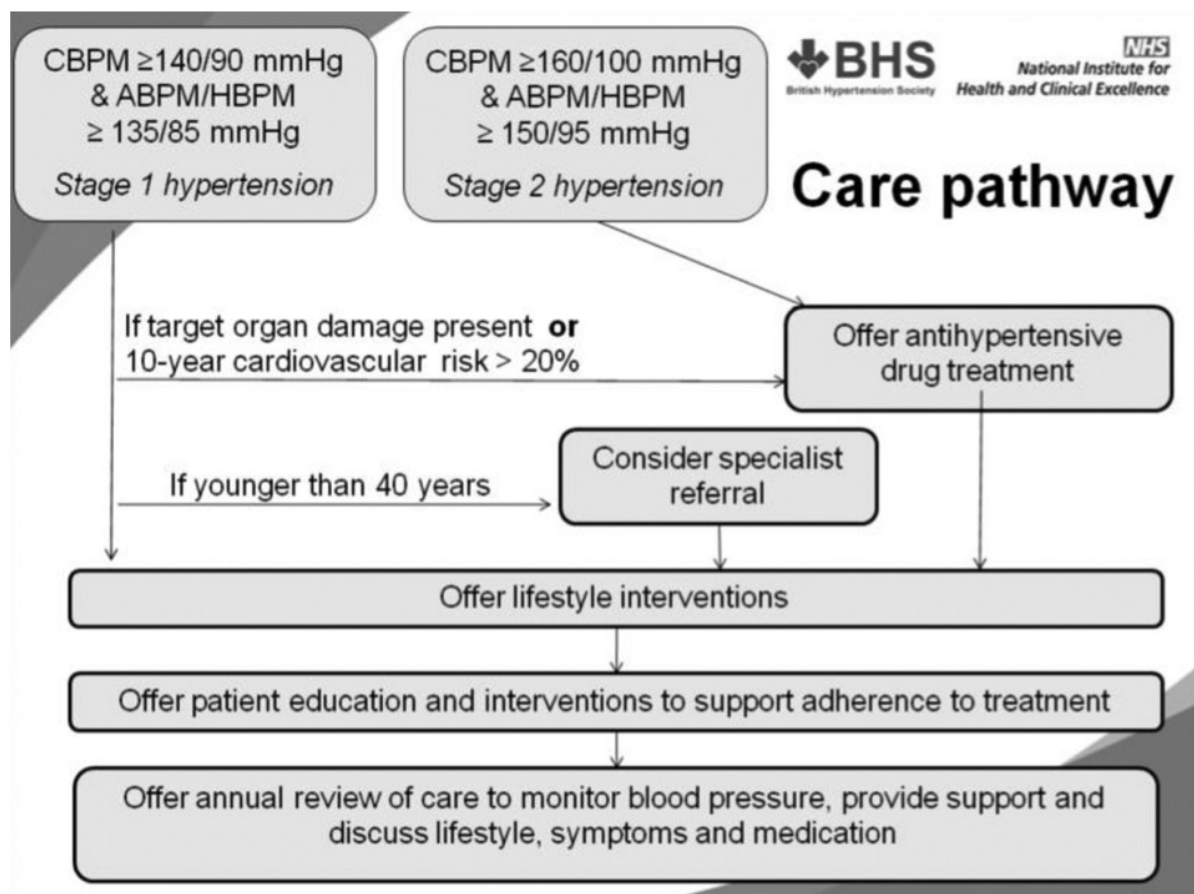

Figure 1: Hypertension care pathway (Physicians' Academy for Cardiovascular Education, 2018)

or fundal haemorrhages and exudates on fundoscopy (signs of malignant hypertension) or signs/symptoms of phaeochromocytoma such as abdominal pain, constipation, chest pain, dizziness, facial flushing and tachypnoea (NICE, 2016).

DISCUSSION

A patient with isolated diastolic hypertension (IDH) has a blood pressure persistently over 90mmHg with a normal systolic blood pressure. Data from the Framingham Heart Study showed that patients with isolated diastolic hypertension are 23.1 times more likely to develop systolic hypertension than those with normal diastolic blood pressure. Hence, it is recommended that patients with IDH should be followed up and a cardiovascular risk assessment is carried out.

Patients with significant postural hypotension (a drop in systolic blood pressure of at least 20 mmHg when standing up from a lying or sitting position) should be considered for a routine referral to hospital. Postural hypotension is commoner in the elderly, diabetic patients and those experiencing dizziness or recurrent falls (NICE, 2016).

It is recommended by the Scottish Intercollegiate Guidelines Network that a cardiovascular risk assessment should be carried out every five years for all adults older than 40 years and for all those who have a first-degree relative who has developed cardiovascular disease when younger than 60 years of age (Franklin, et al., 2005).

Patients diagnosed with hypertension should be specifically asked regarding chest pain, shortness of breath, ankle swelling and palpitations which might suggest congestive heart failure or other complications of hypertension. Secondary hypertension should be considered in patients who are younger than 30 years, respond poorly to antihypertensives or who experience a sudden deterioration of their hypertension. Causes of secondary hypertension include diabetic nephropathy, obesity, polycystic kidney disease, renovascular pathology, Cushing syndrome, aldosteronism, phaeochromocytoma, hypo/hyperthyroidism and hyperparathyroidism (Williams, et al., 2018).

When examining patients diagnosed with hypertension, one should look specifically for signs of hypertensive complications. Auscultation of the heart and lungs should be carried out looking for murmurs and basal crepitations respectively which may indicate heart failure. The location of the apex beat should be assessed since hypertension can lead to left ventricular hypertrophy which in turn leads to a displaced apex beat. One should also assess for ankle/sacral oedema and carry out fundoscopy, looking for papilloedema or retinal haemorrhages (Williams, et al., 2018).

The following clinical investigations should be considered in patients who are diagnosed with hypertension in order to assess for complications of hypertension or for causes of secondary hypertension:

- Blood tests including renal profile, fasting blood glucose, lipid profile and thyroid function tests;
- 12-lead electrocardiogram (ECG) looking for left ventricular hypertrophy, myocardial ischaemia or arrhythmias;
- Urinalysis to test for proteinuria or haematuria as possible markers of glomerular disease (Williams, et al., 2018).

Establishing the total risk of cardiovascular disease

It is recommended in current guidelines (SIGN, 2017) that one uses the Joint British Societies Cardiac Risk Assessor or the ASSIGN cardiovascular risk assessment tool to estimate cardiovascular risk in hypertensive patients (Williams, 2007).

Managing hypertension in the clinic

If the blood pressure is <150/95mmHg, the patient should be counselled regarding lifestyle modifications and the blood pressure should be reviewed at least annually. Evidence from the Trials of Hypertension Prevention, phase 1 (TOHP-1), showed that a weight loss of 10kg led to an average decrease in systolic blood pressure of 5-10mmHg (He, et al., 2000). A meta-analysis carried out by Whelton et al. (2002) found that regular aerobic exercise can reduce systolic blood pressure by 3.8mmHg and diastolic blood pressure by 2.6mmHg in previously sedentary adults. Hypertensive patients (both males and females) should be advised not to exceed the limit of 14 units of alcohol per week. Findings from The Dietary Approaches to Stop Hypertension (DASH) trial demonstrate that there was a 5.5mmHg decrease in systolic blood pressure and a 3.0mmHg decrease in diastolic blood pressure when subjects were given a diet rich in fruits, vegetables and low-fat dairy products as opposed to subjects on a control diet, based on the typical American diet (Appel, et al., 1997).

For patients with a blood pressure ≥135/85 and a 10-year cardiovascular risk of more than 20%, antihypertensive treatment should be initiated along

with lifestyle changes. Based on evidence from the Anglo-Scandinavian Cardiac Outcomes (ASCOT) trial (Sever, et al., 2003) and the NICE guidelines (2016), a four-step algorithm is used to guide clinicians when treating patients with hypertension (Figure 2). The final decision on which drug to use will depend on the individual patient's characteristics.

Step 1: In patients less than 55 years of age who are not of Afro-Caribbean descent, an angiotensin-converting-enzyme (ACE) inhibitor is the first-line drug of choice. This can be substituted by an angiotensin receptor blocker (ARB) in patients who do not tolerate ACE inhibitors. For all Afro-Caribbean patients and Caucasians older than 55 years, a calcium channel blocker is recommended.

Step 2: A calcium channel blocker should be added for Caucasians younger than 55 years of age if the blood pressure is not controlled by an ACE inhibitor or ARB alone. An ACE inhibitor (or ARB if ACE inhibitor is not tolerated) should be added in all Afro-Caribbean patients and in Caucasians older than 55 years who still have high blood pressure despite calcium channel blockers.

Step 3: For all patients whose blood pressure is still not controlled, a thiazide-like diuretic should be added.

Step 4: If the blood pressure is not controlled with three drugs, one should consider adding a non-thiazide diuretic (e.g. furosemide or spironolactone), an alpha blocker (e.g. prazosin), or a beta blocker (e.g. atenolol). The primary care physician should also consider specialist opinion or refer the patient to secondary care.

Prescribing antihypertensive treatment
The physician should take into account the contraindications and side-effects of antihypertensive medications before prescribing. For instance, thiazide diuretics can cause gout and are contraindicated in refractory gout. ACE inibitors can cause renal impairment and are contraindicated in renal failure with creatinine $>200\ \mu$mol/l, known renal artery stenosis, severe aortic stenosis and women of child-bearing age. At initiation of an ACE inhibitor or an angiotension receptor blocker, a renal profile including Glomerular Filtration Rate (GFR) should be taken to establish a "baseline" level. The 2012 Kidney Disease Outcomes Quality Initiative (KDOQI) Clinical Practice Guidelines recommend that follow-up measurements should be carried out in around 4-12 week if the GFR $\geq$60 mL/min/1.73 m^2, change in GFR is <15% and serum potassium $\leq$4.5 mEq/L (KDOQI, 2012).

Evidence for early intensive treatment
In the ACCELERATE (Aliskiren and the calcium channel blocker amlodipine combination as an initial treatment strategy for hypertension control) study, subjects who were randomised to the less effective of two treatments remained at a disadvantage when compared to the dual therapy group, even though the second agent was then added later on in the study (Brown, et al., 2011). Posthoc analysis of the Systolic Hypertension in Europe trial (Thijs, et al., 2010) also demonstrated reductions in blood pressure and in cardiovascular events for initial dual therapy when compared to monotherapy. Results from a recent retrospective cohort study carried out by Xu et al, (2015) showed that delaying the intensification of treatment by more than 1.4 months after elevation of systolic blood pressure was associated with increased cardiovascular morbidity and mortality, hence emphasising the importance of timely management and follow-up of hypertensive patients.

Step	Age <55 years	Age >55 years and black people of African/Carribean descent of any age
1	A	C
2	A + C	
3	A + C + D	
4	**Resistant hypertension** **A+ C +D** + additional diuretic or alpha-blocker or beta-blocker **Consider seeking specialist advice**	

A = ACE inhibitor or low cost ARB

C = calcium-channel blocker

D = thiazide-like diuretic

Figure 2: Four-step algorithm used to guide clinicians when treating patients with hypertension (Northern Ireland Formulary, 2015)

Evidence against early intensive treatment

The PATHWAY-1 study was a randomised double-blind controlled trial which compared initial monotherapy with dual therapy in the management of hypertension (MacDonald, et al., 2015). At one year, the reduction in target organ damage (measured by reductions in left ventricular mass) was similar between the monotherapy and dual therapy groups.

Patient-centred approach

An observational study carried out by Little et al. in 2001 found that patient satisfaction is higher if there is a mutually agreed plan and if patients are involved in the decision-making process. A systematic review carried out in 2012 concluded that clinicians must explore better patients' ideas and concerns on drug side-effects in order to improve adherence to treatment (Marshall, Wolfe and McKevitt, 2012).

CONCLUSION

Hypertension is a very important condition encountered in primary care. Appropriate management of hypertension, making use of evidence-based recommendations as outlined above, will contribute significantly towards an improvement in overall patient health.

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