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Clinical Practice

Hypertension: How To Work With Patients To Get The Perfect Blood Pressure

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Incidence and Prevalence

The incidence and prevalence of hypertension is rife among first and second world countries and arguably, could be labelled the most common chronic disease in the UK[1]. It is estimated that a quarter of all adults in the UK have hypertension[2]. This is alarming in light of the incredible contribution of hypertension to mortality and morbidity. Evidence shows that for each 2mmHg rise of systolic blood pressure, mortality from ischaemic cardiac events rises by 7% and mortality from ischaemic intracranial events rises by 10%[3-4]. The key to reversing this lies in diagnosing hypertension accurately and quickly and knowing how to best treat each patient.

Understanding hypertension

It is still not entirely clear what mechanisms cause hypertension. Evidence has proven that systolic blood pressure increases in a linear fashion with age, which is due to the loss of elastic tissue in arteries with age[1,5]. This is known as 'essential hypertension'. The majority of patients who are diagnosed with hypertension have 'essential hypertension', in other words, there is no clear cause found besides increasing age[1-2]. Research has shown that other factors can be associated with hypertension but alone may not necessarily cause it. Unalterable risk factors include genetic predisposition, age, sex and race. Other factors which have proven to raise blood pressure include environmental factors such as lifestyle and diet, obesity (randomised control trials have shown that a weight loss of one kilogram can be attributed to one mmHg fall in diastolic blood pressure[5]), excessive alcohol intake, smoking, stress at work or in the home, socio-economic status and recent major life events[1-2,6].

How to take the perfect blood pressure

In the clinic setting, make sure the patient is relaxed, sit the patient comfortably with their arm outstretched, resting on the table and wait a few minutes. Make sure the sleeves are not too tight as this will alter the readings[1,5]. Be careful that the blood pressure cuff is the correct size for the patient as small cuffs can give a false high reading for larger patients and larger cuffs can give a false low reading for smaller patients[3,5]. Check the pulse is regular as irregular pulses can give incorrect readings from automated devices - if in doubt perform it manually[5]. Take the blood pressure in both arms and repeat several times, discard the first reading and always record the lowest reading in the patient's file[1].

The well recognised 'white coat syndrome' has a prevalence of about 10% in the UK and according to NICE data, the syndrome can cause a difference of 20/10mmHg between readings in a clinical setting and those at home[1,3,5]. In light of this, NICE altered the guidelines in 2011, stating that any patient with a reading close to 140/90mmHg is to be sent home with an Ambulatory Blood Pressure Monitor (ABPM)[3]. This is a device attached to the patient for a minimum of 24 hours and it records the patient's blood pressure every 30 minutes of the patient's waking day. The idea behind this is to rule out any 'white coat syndrome' and to get a range of readings as the patient goes about their usual day to day activities. In this way, when the readings are analysed (an average of at least 14 readings are taken by the clinician), it confirms diagnosis immediately and treatment can be initiated[1,3].

The value of repeated measurements in different settings has been shown in evidence from as early as the 1970s[2,5]. Research has also shown that patients usually have a high blood pressure reading initially which drops after subsequent measurements, hence the new guidelines are in place to allow for a range of readings before diagnosing and treating hypertension[1,3].

Investigations

While the patient is still in the clinic, assess the patient's overall cardiovascular risk score using the cardiovascular risk assessment tool[3]. Perform a thorough physical examination, including looking for evidence of target organ damage, for example, left ventricular hypertrophy, renal disease, peripheral vascular disease and changes in the retina from raised blood pressure[1,3,5]. If there is suspicion of hypertension, send the patient home on an ABPM[3]. While waiting for the results of the ABPM, any patient under investigation for hypertension needs to have a baseline set of tests[1,7-8]. This includes a full blood count, renal function tests, liver function tests, a fasting glucose and cholesterol blood test, an ECG (electrocardiogram) and a urine dip. These tests are a basic screen for assessment of target organ damage[6,9]. If these investigations are not adequate, a patient can be referred for more extensive investigation for target organ damage, for example, an echocardiogram or a renal ultrasound/angiography[1,3,5].

Any patient that is young or presenting with persistent hypertension, especially that which does not respond to treatment, needs further investigation for other causes, such as renal disease, adrenal disease, alcoholism or steroid use (not to forget the oral contraceptive pill can also cause hypertension[1,7,9].

In general, a patient should be treated if their blood pressure readings are persistently 140/90mmHg or higher. For those that have borderline readings, for example, 135/85mmHg, clinicians must assess their cardiovascular risk score and look for target organ damage. If there is evidence for either of these, a patient should be started on treatment immediately[1].

Treatment

Non-pharmacological

First line treatment of hypertension is always non-pharmaceutical; also known as 'lifestyle changes' [1,3,5,9]. Attempt to find out the details of the patient's diet, weight, employment, stress levels at work/home, exercise, alcohol intake and smoking habits. Once established, assist the patient in altering their lifestyle choices in order to lower their blood pressure. Patients often feel overwhelmed and many benefit from group activities, such as smoking cessation and weight loss groups[3]. Other ideas include a dietician referral, counsellors if they are struggling with motivation and low moods, gym sessions/personal trainers. Encourage the patient in that if they succeed in altering their lifestyle and therefore bringing down their blood pressure, they can avoid prescription medication.

Lifestyle changes can delay hypertension for many years but if the blood pressure continues to creep upwards in subsequent multiple visits and lifestyle options have been exhausted, it would then be appropriate to start pharmacological management[1,3,5].

Pharmacological Treatment

In general terms, always start with monotherapy and increase the dose according to patient response. According to NICE guidelines from 2011, if a patient is over 55 years of age and/or Afro-Caribbean in origin, start with a calcium channel blocker, such as Amlodipine[3]. If these are contra-indicated, start with a thiazide diuretic[3]. In regards to thiazide diuretics, the new NICE guidelines state that Chlortalidone (12.5–25.0 mg once daily) or Indapamide (1.5 mg modified-release or 2.5 mg once daily) should be used in preference to what clinicians have been prescribing for years, namely Bendroflumethiazide and Hydrochlorothiazide[3]. For those who are already on these conventional thiazide diuretics, NICE state that if the patient's blood pressure is stable, to continue with Bendroflumethiazide or Hydrochlorothiazide[3].

Patients diagnosed with hypertension who are under 55 years of age, should be started on an ACE inhibitor (Angiotensin Converting Enzyme inhibitor), for example, Ramipril[3], but if this is not tolerated, replace it with an ARB (Angiotensin II Receptor Blocker) such as Losartan[3].

Review the patient every few weeks initially and extend the reviews to 6 months once the blood pressure is within therapeutic range[6].Do not forget to check the patient's renal function in the first few months of starting a new drug and always be aware that if a patient's blood pressure drops drastically after starting an ACE inhibitor this suggests underlying renal disease and must be investigated[1,3,5,9].

Continue to titrate the dose of the drug until the patient's blood pressure is satisfactory. Consider adding in a second agent when the patient is nearing maximum dose of the first agent and the blood pressure is rising again[3,5]. Depending on what the patient is on, add in either an ACE inhibitor, ARB or a calcium channel blocker, for example, if patient is on Ramipril, add in Amlodipine and vice versa[3]. If a calcium channel blocker is not tolerated as second line, consider using thiazide diuretics. Afro-Caribbean patients who are already on calcium channel blockers, add in an ARB, rather than an ACE inhibitor[3].

Following that, if the blood pressure is still not within therapeutic range, consider adding in a third agent or alternatively, discontinue the first agent and continue with the second and add a third from among an ACE inhibitor, ARB or calcium channel blocker. Consider a thiazide diuretic if patients are intolerable to any of the above[3].

Beta-blockers should not be considered in treating hypertension, according to NICE, unless the patients are very young or intolerant to ACE inhibitors, ARBs or calcium channel blockers[3].

Beware and monitor closely any elderly patients who are on antihypertensives as the physiology of ageing interferes with the drugs, for example, decreased clearance of drugs from the kidney or liver, decreased sensitivity to baroreceptors (postural hypotension), chronic sodium retention and reduced cardiac reserve. Do not forget communication and compliance issues with the elderly also[1,7].

Make sure there is an annual review for each patient that has been diagnosed with hypertension in order to get blood pressure readings, medication review and how the patient is coping with lifestyle changes or side effects of the antihypertensives.

When to Refer

Resistant hypertension is defined as a patient remaining hypertensive despite being on triple or quadruple drug therapy[3,7]. Consider starting a low dose of Spironolactone (if the serum potassium is less than 4.5mmol/l) and refer to a specialist for advice[3-4].

If subsequent readings are 180/110mmHg or more, start antihypertensives immediately and refer the patient to hospital.

Also refer immediately if retinal haemorrhages or papilloedema are seen[1,3].

Summary

If a patient is suspected to have hypertension, send them home with an ABPM and perform baseline tests[1,3].

Start treatment if blood pressure is 140/90mmHg and ABPM average is 135/85mmHg and/or patient has one of the following:

- target organ damage
- established cardiovascular disease
- renal disease
- diabetes
- 10-year cardiovascular risk equivalent to 20% or greater (NICE guidelines, 2011)[3]

Start on monotherapy and review every few months, until blood pressure is stable[3].

Review yearly after stability has been reached and consider adding in further antihypertensives if the blood pressure rises again.

Book patients in for annual reviews of end organ damage as this is an excellent overview of disease progression.

Hypertension is to be respected in light of its incredible contributor to morbidity and mortality. Never underestimate the importance of keeping a patient's blood pressure within the desired range[4].

Competing Interests
None declared
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