



The management of hypertension

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The following article charts the latest approaches to managing and treating this increasingly prevalent condition

The World Health Organisation (WHO) describes hypertension as “a condition in which blood vessels have persistently raised pressure”. If left untreated, hypertension can have detrimental effects on health and mortality, leading to preventable incidents such as myocardial infarction, heart failure, stroke and kidney failure. There has been a surge in the prevalence of hypertension worldwide, climbing from six hundred million in 1980 to one billion in 2008 and if appropriate action is not taken, deaths due to cardiovascular disease are projected to rise, according to WHO.

Definitions

Defining the cut-off point between normotensive and hypertensive has proven difficult (Mancia et al., 2013). Trials have demonstrated the beneficial reduction in cardiovascular risk when reducing systolic blood pressure (SBP) below 140mmHg (Liu et al., 2005). However, trials to observe the benefit of aggressive SBP lowering below 130 mmHg were unable to find significant reduction in stroke or cardiovascular risk (ACCORD Study Group, 2010 and Yusuf, et al., 2008). In light of this and contrary to recent guidelines, the threshold for defining hypertension in a person with diabetes, cardiovascular disease or chronic kidney disease has been modified from 130/80 to 140/80 (Mancia et al., 2009). (Table 1).

Table 1. Definition and classification of hypertension in adults, parameters (mmHg):

High normal 1	30–139 and/or 85–89
Grade 1 hypertension	140–159 and/or 90–99
Grade 2 hypertension	160–179 and/or 100–109
Grade 3 hypertension	≥180 and/or ≥110

(Mancia et al., 2013)

While ambulatory blood pressure monitoring (ABPM) and home blood pressure monitoring (HBPM) both provide a more reliable assessment of actual blood pressure and a more successful prediction of cardiovascular risk (Dolan et al., 2005 and Segal et al., 2005), guidelines still are based on office blood pressure being considered the current gold standard. This decision is based on considerations in relation to the cost and resources influencing best practice.

Clinical management

Hypertension in general is asymptomatic but may be associated with headaches, shortness of breath, dizziness, chest pain, palpitations and nosebleeds. A comprehensive clinical assessment, including family and medical history, with relevant recommended diagnostic tests is required to identify the presence of end organ damage and determine

contributing risk factors (Madhur, 2013). A routine ECG provides information on cardiovascular disease and organ damage, as well as establishing the need for a 24-hour Holter monitor or echocardiogram if indicated by results (Mancia et al., 2013). Auscultating the heart, carotid arteries and renal arteries will verify the need for echocardiogram, carotid ultrasounds or renal vascular ultrasound in the presence of a murmur.

A urinalysis identifies the presence of microalbuminuria and assesses end organ renal damage and a fasting glucose to assess for diabetes. A renal profile provides a useful check for asymptomatic organ damage of the kidneys as well as establishing a baseline prior to commencing antihypertensive medications. A fasting lipid profile is advised, as the benefit of statins in people with high cardiovascular risk remains justified according to most recent guidelines (Mancia et al., 2013).

Other than urinalysis and measurement of urea and electrolytes, more extensive testing for identifiable causes is not generally indicated, unless blood pressure control is not achieved (Chobanian et al., 2003). Referral to specialist physicians is sometimes required as many people with hypertension will have more than one cardiovascular risk factor and baseline assessments may highlight the need for further investigations. McCormack and Cappuccio (2008) advise that measures should be taken prior to referring to a specialist such as ensuring adherence to medication – compliance being a major pitfall in control of hypertension – and lifestyle modification.

It is suggested that at primary care level, it is reasonable to see if satisfactory blood pressure control can be achieved with the use of two agents in combination before considering referral to a specialist unit. The standard combinations in use these days would include a calcium channel blocker as monotherapy moving to a combination of a calcium channel blocker and ACE inhibitor (ACE-I) as second line therapy. While beta-blockers are approved as first line agents, they would generally be reserved for patients with another indication such as angina pectoris, heart failure, atrial fibrillation or even anxiety.

Current European guidelines recommend screening for all patients for secondary sources of hypertension as a wise precaution but this may not be feasible in terms of resources (Mancia et al., 2013). Secondary hypertension accounts for 2-10 per cent of cases (Madhur, 2013). Possible causes of secondary hypertension include obesity, obstructive sleep apnoea, renal artery stenosis, nephritic syndrome, coarctation of the aorta, Conn's Syndrome and drugs such as NSAIDs, steroids, combined contraceptive pill, ciclosporin, cocaine and alcohol (McCormack and Cappuccio, 2008).

Medical therapy

Medical therapy is recommended in grade 1 hypertension in people with organ damage, high cardiovascular risk factors, diabetes, cardiovascular disease, or chronic kidney disease. It is also recommended when blood pressure remains high, despite having modified one's lifestyle for a reasonable period of time. Medical therapy can be commenced with grade 2 and 3 hypertension immediately with, or after a period of time of lifestyle changes (Mancia et al., 2013). In elderly hypertensive patients, drug therapy is recommended when systolic blood pressure is above 160mmHg and may be reduced to below 150mmHg, rather than 140mmHg, as studies have shown this to be effective. However, medication therapy may be considered in elderly patients when the SBP range is 140-159mmHg, provided the therapy is well tolerated (Mancia et al., 2013).

European Society of cardiology guidelines (2013) reinforce

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the 2007 guidelines (Mancia et al., 2013) that concluded that diuretics, beta-blockers, calcium antagonists, angiotensin-converting enzyme (ACE) inhibitors and angiotensin receptor blockers are all suitable for the initiation and maintenance of antihypertensive therapy as monotherapy or in some combinations.

An ACE-I prevents the conversion of angiotensin 1 to angiotensin 2 in the lungs during the renin-angiotensin cycle, decreasing peripheral vessel resistance causing vasodilation and preventing cardiac remodelling (Lopez-Sendon et al., 2004). An ACE-I must not be given to patients with renal stenosis as this may cause a drop in renal perfusion and precipitate renal failure. Other contra indications include aortic stenosis, obstructive cardiomyopathy and hyperkalaemia (Lopez-Sendon et al., 2004). Angiotensin 2 receptor blockers (ARBs) are indicated for patients who cannot tolerate an ACE-I, as they do not inhibit the breakdown of bradykinin in the lungs, therefore users will not be at risk of developing the associated cough. Contra indications are similar to an ACE-I. In addition, they may also increase hepatic enzyme levels (Chobanian et al., 2003).

Beta-blockers act as an anti-hypertensive, as well as producing an anti-arrhythmic and anti-ischaemic effect. Contraindications to beta-blocker initiation include asthma, symptomatic hypotension, bradycardia, severe heart failure, and heart block (Lopez-Sendon et al., 2004).

For decades, thiazide diuretics have been recommended as first choice therapy and as a component in combination therapy in most cases (Chobanian et al., 2003). Contraindications include severe kidney dysfunction and hypernatraemia (Hermann, 2010). Loop diuretics block reabsorption of sodium chloride and water in the kidneys. They may also cause severe kidney dysfunction and hypernatraemia (Mancia et al., 2013). Potassium-sparing diuretics work by acting on the distal tubule in the kidneys, independently of aldosterone. Potassium levels must be monitored for hyperkalaemia, especially when prescribed with an ACE-I or an ARB (Hermann, 2010).

Calcium antagonists can be divided into dihydropyridines (DHPs) and non-DHPs. DHPs may cause peripheral oedema, dizziness or headaches, while non-DHPs are contraindicated in patients with sick sinus syndrome, second and third-degree AV block (Basile, 2004).

Lifestyle

Lifestyle changes are essential in the prevention and treatment of hypertension and its associated risks. The most important

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behavioural risk factors are unhealthy diet, physical inactivity, tobacco use and harmful use of alcohol (WHO, 2013) as they contribute to the development of the metabolic risk factors of obesity, diabetes and raised blood lipid levels.

Mancia et al. (2013, p28) rank quitting smoking as “probably the single most effective lifestyle change measure for preventing cardiovascular disease”. Smoking cessation medications are recommended when necessary, yet these drugs are reported to be underused due to adverse effects, contraindications and cost (Mancia et al., 2013).

Necessary alterations to make the transition to a healthy lifestyle include a restricted salt intake to 5-6g per day, a moderate consumption of alcohol, a diet low in fat and high in vegetables, fruit and lean meat, maintaining an appropriate weight and partaking in regular exercise (Mancia, et al. 2013 and Dickinson, et al. 2006). Adopting this approach to modifiable risk factors has proved to be as successful as monotherapy in reducing blood pressure (Elmer, et al. 2006), however the difficulty lies in long-term compliance.

The rationale for therapy is to obtain an end result of lowering blood pressure within the appropriate parameters relevant to each individual. If optimal lifestyle and medical therapy do not reach desired results, invasive approaches may be an option to consider. Renal denervation and carotid baroreceptor stimulation show promising potential, however long-term comparison trials to establish persistent efficacy is required (Mancia et al., 2013).

Follow up

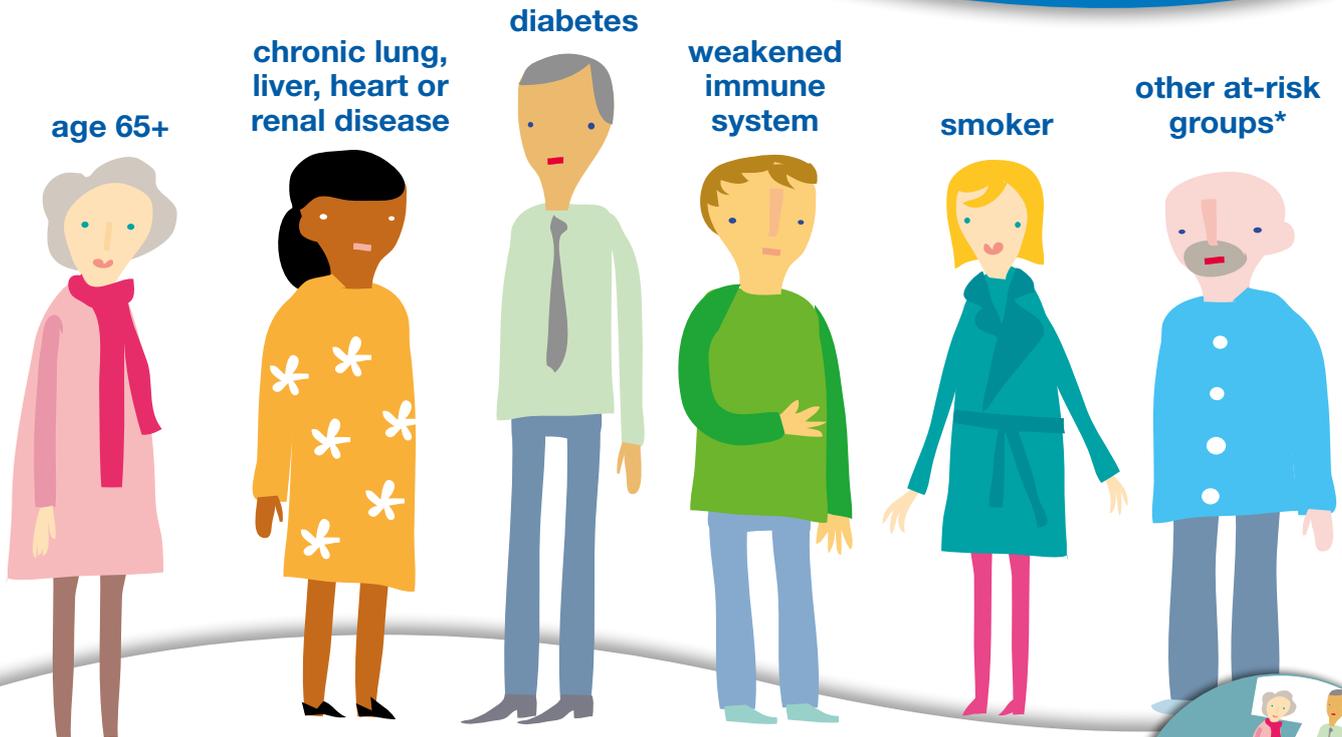
Follow up visits involve assessing the effectiveness of the prescribed antihypertensive therapy. This may involve a kidney function lab test to review potassium levels and renal function, depending on prescribed medication.

The role of the healthcare provider involves referring the individual to appropriate members of the multidisciplinary team in order to provide effective person-centred advice and care to assist them to continue to adhere to their antihypertensive therapy, e.g. smoking cessation, or dietitian. Ensuing visits offer an opportunity to educate, counsel and empower the person to become proactive in their own wellbeing (Madhur, 2013). Information and support for family members is also essential (McLean and Timmins, 2007) as they can provide a supportive and encouraging role in modification risk factors. Aspirin may also be introduced during follow up reviews as it is recommended in people who have had a previous cardiovascular event, high cardiovascular risk or impaired renal function once blood pressure is controlled and its benefit outweighs potential harm (Mancia et al., 2013).

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