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):

<table>
<thead>
<tr>
<th>Category</th>
<th>SBP</th>
<th>DBP</th>
</tr>
</thead>
<tbody>
<tr>
<td>High normal 1</td>
<td>130–139</td>
<td>85–89</td>
</tr>
<tr>
<td>Grade 1 hypertension</td>
<td>140–159</td>
<td>90–99</td>
</tr>
<tr>
<td>Grade 2 hypertension</td>
<td>160–179</td>
<td>100–109</td>
</tr>
<tr>
<td>Grade 3 hypertension</td>
<td>≥180</td>
<td>≥110</td>
</tr>
</tbody>
</table>

(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 Sega 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
Contraindications to beta-blocker initiation include asthma, symptomatic hypotension, bradycardia, severe heart failure, and heart block.

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...
Hypertension in general is asymptomatic but may be associated with headaches, shortness of breath, dizziness, chest pain, palpitations and nosebleeds.

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).

References


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Vaccinate your at-risk patients and those 65 years and over against serious pneumococcal disease.

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**Pneumococcal Polysaccharide Vaccine**

- **Indications:** For active immunisation against disease caused by the pneumococcal serotypes included in the vaccine. The vaccine is recommended for individuals 2 years of age or older in whom there is an increased risk of morbidity and mortality from pneumococcal disease. The specific at risk categories of persons to be immunised are to be determined on the basis of official recommendations. The vaccine is not effective for the prevention of acute otitis media, sinusitis and other common upper respiratory tract infections.

- **Dosage and administration:** One single dose of 0.5 millilitre is administered by intramuscular or subcutaneous injection. Special dosing: It is recommended that pneumococcal vaccine is given at least two weeks before elective splenectomy or the initiation of chemotherapy or other immune suppressive treatment. Vaccination during chemotherapy or radiation therapy should be avoided, and the vaccine should not be administered any sooner than three months after completion of such therapy. Persons with asymptomatic or symptomatic HIV infection should be vaccinated as soon as possible after diagnosis is confirmed. Revacccination: Healthy adults and children should not be revaccinated routinely. Revaccination of intervals of less than three years is not recommended because of an increased risk of adverse reactions. Revaccination may be considered for adults at increased risk of serious pneumococcal infection who were given pneumococcal vaccine more than five years earlier or for those known to have rapid decline in pneumococcal antibody levels. Revaccination after 3 years may be considered for selected populations (e.g. immunosuppressive therapy), the expected serum antibody response may not be obtained after a first or second dose, so such patients may not be as well protected against pneumococcal disease as immunocompetent individuals. Required prophylactic pneumococcal antibiotic therapy should not be stopped after vaccination. The vaccine may not be effective in preventing infection resulting from basilar skull fracture or from external communication with cerebrospinal fluid. As with any vaccine, vaccination with Pneumovax II may not result in complete protection in all recipients.

- **Contraindications:** As with any vaccine, adequate medical treatment, including epinephrine (adrenaline), and supervision should always be available in case of an acute anaphylactic reaction. It is not known whether the vaccine can cause foetal harm or affect reproduction capacity when administered to a pregnant woman; the vaccine can be given to pregnant women only if clearly needed (potential benefit outweighs potential risk). It is not known whether this vaccine is excreted in human milk; caution should be exercised when the vaccine is administered to a nursing mother. Vaccination should be delayed in the presence of significant febrile illness or other active infection, except where delay involves greater risk. The vaccine should never be injected intravascularly. The vaccine should not be injected intradermally as injection by that route is associated with increased local reactions. If the vaccine is administered to a nursing mother. Vaccination should be delayed in the presence of acute otitis media, sinusitis and other common upper respiratory tract infections. **Presentation:** Pneumovax II is supplied in a single dose vial containing 0.5 millilitre of solution. Each vial contains 25 micrograms of each polysaccharide type derived from capsules of the 23 most prevalent pneumococci, dissolved in isotonic saline solution containing 0.25% phenol. **Summary of Product Characteristics for full product information.**

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- **Marketing authorisation number:** PL 06745/0103

- **Legal category:** POM

- **Date of last review:** August 2013

**Pneumovax® II solution for injection in a vial** Pneumococcal Polysaccharide Vaccine Refer to Summary of Product Characteristics for full product information. Presentation: Pneumovax II is supplied as a single dose vial containing 0.5 millilitre of solution. Each dose contains 25 micrograms of each polysaccharide type derived from capsules of the 23 most prevalent pneumococci, dissolved in isotonic saline solution containing 0.25% phenol. 

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**Are your patients at risk?**

- age 65+
- chronic lung, liver, heart or renal disease
- diabetes
- weakened immune system
- smoker
- other at-risk groups*

Information about adverse event reporting can be found at www.imb.ie. Adverse events and inadvertent vaccination during pregnancy should also be reported to Sanofi Pasteur MSD by calling 00 44 1628 785291.

*See Immunisation Guidelines for Ireland www.immuniastion.ie
Arterial Hypertension of the European Society of Hypertension (ESH) and of the European Society of Cardiology (ESC), *Journal of Hypertension*, 25(6), pp. 1105–1187.


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