Wales Centre for Pharmacy Professional Education
Canolfan Addysg Fferylliaeth Broffesiynol Cymru

ANTIHYPERTENSIVES

Top tips for MURs

- Check that patient has Blood Pressure and Heart Rate measured every twelve months
- Check that the patient has renal function tests every twelve months
- Ensure that Diltiazem or Nifedipine modified release preparations are prescribed by proprietary name
- Counsel patients on signs and symptoms of complications that need referral (see below)
- Counsel patients on common side effects (see below)
- Advise patient to sit up and stand slowly first thing in the morning and to drink adequate but not excessive amounts of fluids to prevent hypotension (dizziness & light headedness)
- Advise patient to take medication regularly (no missed doses) with adequate but not excessive amounts of fluids to prevent dehydration
- Advise patient to avoid drinking grapefruit juice if taking calcium channel blockers or Aliskirin and to avoid taking OTC NSAIDs
- Counsel patients on avoiding soluble OTC preparations e.g. painkillers due to high sodium content
- Check that the patient has an annual influenza vaccination and a one off pneumococcal vaccination

Pathophysiology of Hypertension

Hypertension (increased blood pressure) is caused by an increased cardiac output due to raised peripheral resistance caused by prolonged contraction of arterioles of smooth muscle walls which results in a thickening of the vessel walls. Additionally the activation of the renin-angiotensin aldosterone system results in vasoconstriction and sodium / water retention, as well as vasoconstriction due to activation of the sympathetic nervous system by stress or exercise all result in an increased blood pressure[1].

Lifestyle issues

- Counsel patients on reducing alcohol intake to within safe limits (2 units/day for women & 3 units/day for men per week)
- Counsel patients on healthy eating, exercise & weight loss (if BMI > 25kg/m^2) - reduce saturated fat and salt intake, avoid salt substitutes, increase oily fish intake, complete 30 minutes of aerobic exercise three to five times a week, reduce caffeine intake to no more than 5 cups a day and recommend 5 portions of fruit and vegetables a day
- Advise patients who smoke of the benefits of stopping smoking and how to access enhanced smoking cessation services in community pharmacy and GP practices

Red flags that need referral

- Any heaviness in the centre of your chest, triggered by effort or emotion
- Any fatigue or water retention
- Feeling unwell and generally out of sorts, irregular heart beat and muscle weakness (potassium levels need to be checked)
- Any intermittent dull, cramping pain or tightness in legs while exercising that disappears at rest
- Any symptoms of depression (low self esteem, lack of energy, weight loss, appetite loss, early morning wakening, lack of concentration)
- Any symptoms of impaired glucose tolerance or diabetes (extreme tiredness, thirst or excessive urination)

How does antihypertensive medication work?

Thiazides and related diuretics e.g. bendroflumethiazide, furosemide, amiloride, spironolactone	Increases excretion of sodium, potassium and water, which causes the circulating volume to be diminished, reducing preload on the heart, reducing cardiac output which reduces BP
Beta-adrenoreceptor blocking drugs e.g. bisoprolol	Act on the sympathetic nervous system (reduces the peripheral resistance to blood flow by relaxing smooth muscle in arteries and reduces the cardiac response to stress and exercise which reduces BP).
Centrally acting antihypertensive drugs e.g. methyldopa	Stimulates the alpha-2 adrenoreceptors in the brain, which decreases cardiac output and peripheral vascular resistance which reduces BP.
Alpha-adrenoreceptor blocking drugs e.g.doxazosin	Blocks the action of noradrenaline in arteries / veins causing vasodilatation of vascular smooth muscles and a fall in peripheral resistance, which reduces BP.

Compiled by D Roberts, WCPPE, November 2011
Expert review: Kate Llewellyn, ABHB, November 2011

How does antihypertensive medication work? (continued)

Drugs affecting the renin-angiotensin system e.g. lisinopril, losartan	ACEI's (angiotensin-converting enzyme inhibitors) inhibit conversion of angiotensin I to angiotensin II by inhibiting ACE. Prevent breakdown of bradykinin and accumulation causes dry cough. ARBs (angiotensin II receptor blockers) act directly on angiotensin II receptor to antagonise its effects. Does not inhibit bradykinin breakdown. Both block the effects of aldosterone and therefore reduce reabsorption of sodium and water from the kidneys.
Calcium-channel blockers e.g. amlodipine	Relaxes the blood vessels in smooth muscles by interfering with the flow of calcium through the channels in these vessels, causing peripheral arteriolar dilation which reduces the resistance to blood flow and hence reduces BP.

What are the common side effects to look out for?

Drug	Common side effects	Recommendation
Thiazides and related diuretics	Gastro-intestinal disturbances, high blood glucose levels, hyperlipidaemia, hypokaleamia (could lead to arrhythmias), hyponatraemia	Refer to GP for tests. Monitor more closely in diabetics.
	Gout,	Potential for prophylaxis with allopurinol (Gout)
	Postural hypotension	Advise patient to sit up and stand slowly first thing in the morning
	Cramps	Drink adequate but not excessive amounts of fluids as cramp is common symptom of dehydration
Beta-adrenoreceptor blocking drugs	Cold extremities, tightness of chest of difficulty breathing, extreme thirst, tiredness or excessive urination	Refer to GP for tests
	Sleep disturbances & nightmares	Refer to GP to potentially switch to a water soluble tablet which is less likely to cause these effects (Atenolol, Sotalol)
	Bradycardia,	Refer to GP
	Mask hypoglycaemia	Diabetics to monitor blood glucose more closely
Centrally acting antihypertensive drugs	Drowsiness, dry mouth, bradycardia, GI disturbances	Advise patients not to operate machinery or drive. Refer to GP if persists
Alpha-adrenoreceptor blocking drugs	Drowsiness, hypotension, dizziness, headache, dry mouth, blurred vision, GI disturbances	Advise patients not to operate machinery or drive. Refer to GP if persists
Drugs affecting the renin-angiotensin system	Swelling of the hands, feet, eyes, lips or genitals (Angioedema), Hyperkalaemia	Refer to GP (if suspected angioedema refer urgently)
	Troublesome persistant dry cough	Refer to GP to try a different ACEI
	Hypotension	Advise patient to sit up and stand slowly first thing in the morning and also to take initial doses at night
Calcium-channel blockers	Facial flushing, dizziness & headaches	Take regularly to diminish these effects.
	Ankle oedema	Refer to GP
	Constipation	Gentle laxative can be taken
All	Impotence	Refer to GP for assessment of suitability for erectile dysfunction medication

Potential serious drug interactions?

See BNF Appendix 1 for details, but consider more specifically the increased risk of myopathy when diltiazem and high dose statins are prescribed together and the risk of increased levels of ivabradine when used concomitantly with diltiazem and verpamil.

Where can you find more information?

- Cardiovascular system – BNF sub-section 2.2 to 2.6
- Coronary Heart Disease distance learning pack that can be found on WCPPE website (www.wcppe.org.uk)
- NICE guidance: Hypertension – clinical management of primary hypertension in adults, August 2011 can be found on NICE website (www.nice.org.uk)
- Clinical Knowledge Summary (Prodigy) Hypertension can be found on CKS website (www.cks.nhs.uk/home)

References

1 Evidence based management of Coronary Heart Disease, NICPLD, 2009

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