Hypertension

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Definition of Hypertension

- is typically classified based on clinic blood pressure measurements

Types of Hypertension

- Primary (Essential) Hypertension:
- Accounts for ~90-95% of cases.
- Multifactorial causes, including genetics, obesity, high salt intake, and sedentary lifestyle.
- **Secondary Hypertension**:
- Caused by identifiable underlying conditions, including:

Category	Systolic blood pressure (mmHg)	Diastolic blood pressure (mmHg)
Blood pressure		
Optimal	< 120	< 80
Normal	< 130	85
High normal	130–139	85–89
Hypertension		
Grade 1 (mild)	140–159	90–99
Grade 2 (moderate)	160–179	100–109
Grade 3 (severe)	≥ 180	> 110
Isolated systolic hypertension		
Grade 1	140–159	< 90
Grade 2	≥ 160	< 90

- Renal diseases (e.g., chronic kidney disease, renovascular hypertension).

- Endocrine disorders (e.g., primary aldosteronism,pheochromocytoma, Cushing's syndrome).

- Coarctation of the aorta.
- Drug-induced hypertension (e.g., NSAIDs, steroids).

- The risk of cardiovascular diseases such as stroke and CAD is closely related to levels of BP, which follows a normal distribution in the general population.
- Although there is no specific cut-off above which the risk of cardiovascular risk suddenly increases, the diagnosis of hypertension is made when systolic and diastolic values rise above a specific threshold that corresponds to the level of BP at which the risk of cardiovascular complications and benefits of treatment outweigh the treatment costs and potential side-effects of therapy

Pathogenesis

- Many factors may contribute to the regulation of BP and the development of hypertension, including renal dysfunction, peripheral resistance, vessel tone, endothelial dysfunction, autonomic tone, insulin resistance and neurohumoral factors
- In more than 95% of cases, no specific underlying cause of hypertension can be found. Such patients are said to have **essential hypertension**.
- Hypertension has a number of adverse effects on the cardiovascular
- system.
- In larger arteries (> 1 mm in diameter), the internal elastic lamina is thickened, smooth muscle is hypertrophied and fibrous tissue is deposited

Clinical features

- Hypertension is usually asymptomatic until the diagnosis is made at a
- routine physical examination or when a complication arises.
- Reflecting this fact, a BP check is advisable every 5 years in adults over 40 years of age to pick up occult hypertension.
- Sometimes clinical features may be observed that can give a clue to the underlying cause of hypertension.

Causes of secondary hypertension

Alcohol

Obesity

Pregnancy

Renal disease

- Parenchymal renal disease, particularly glomerulonephritis
- Renal vascular disease
- Polycystic kidney disease

Endocrine disease

- Phaeochromocytoma
- Cushing's syndrome
- Primary hyperaldosteronism (Conn syndrome)
- Glucocorticoid-suppressible hyperaldosteronism
- Hyperparathyroidism
- Acromegaly
- Primary hypothyroidism
- Thyrotoxicosis
- Congenital adrenal hyperplasia due to 11β-hydroxylase or 17α-hydroxylase deficiency
- Liddle syndrome
- 11β-hydroxysteroid dehydrogenase deficiency

Drugs

Coarctation of the aorta

How to measure blood pressure

- Use a machine that has been validated, well-maintained and properly calibrated
- Measure sitting BP routinely, with additional standing BP in older and diabetic patients and those with possible postural hypotension; rest the patient for 2 minutes Remove tight clothing from the arm Support the arm at the level of the heart

- Use a cuff of appropriate size (the bladder must encompass more than two thirds of the arm)
- Lower the pressure slowly (2 mmHg per second)
- Read the BP to the nearest 2 mmHg
- Use phase V (disappearance of sounds) to measure diastolic BP

Take two measurements at each visit

Investigations

- confirm the diagnosis by obtaining accurate, representative BP
- measurements
- identify contributory factors and any underlying causes
- assess other risk factors and quantify cardiovascular risk
- detect any complications that are already present
- identify comorbidity that may influence the choice of antihypertensive therapy

- Urinalysis for blood, protein and glucose
- Blood urea, electrolytes and creatinine
- Hypokalaemic alkalosis may indicate primary hyperaldosteronism but is usually due to diuretic therapy
- Blood glucose---
- Serum total and HDL cholesterol
- Thyroid function tests---
- 12-lead ECG (left ventricular hypertrophy, coronary artery disease

Management

- The objective of antihypertensive therapy is to reduce the incidence of adverse cardiovascular events, particularly CAD, stroke, and heart failure

Treatment targets

- The optimum BP for the reduction of major cardiovascular events has been
- found to be 139/83 mmHg, and even lower in patients with diabetes mellitus

- Primary care strategies have been devised to improve screening and detection of hypertension

Non-drug therapy

- Appropriate lifestyle measures may obviate the need for drug therapy in
- patients with borderline hypertension, reduce the dose or the number
- of drugs required in patients with established hypertension, and directly
- reduce cardiovascular risk.
- Correcting obesity, reducing alcohol intake, restricting salt intake,
- taking regular physical exercise and increasing consumption of fruit and
- vegetables can all lower BP.
- Moreover, stopping smoking, eating oily
- fish and adopting a diet that is low in saturated fat may produce further
- reductions in cardiovascular risk that are independent of changes in BP.

Drug therapy

- Thiazides The mechanism of action of these drugs is incompletely
- understood and it may take up to a month for the maximum effect to be observed.
- ACE inhibitors ACE inhibitors (enalapril 5–40 mg daily, ramipril 5–10 mg
- daily or lisinopril 10–40 mg daily) are effective and usually well tolerated.
- They should be used with care in patients with impaired renal function
- or renal artery stenosis because they can reduce glomerular filtration
- rate and precipitate renal failure

- Angiotensin receptor blockers ARBs (irbesartan 75–300 mg daily, valsartan 40–160 mg daily) have similar efficacy to ACE inhibitors but they do not cause cough and are better tolerated
- Calcium channel antagonists Amlodipine (5–10 mg daily) and nifedipine
- (30–90 mg daily) are effective and usually well tolerated antihypertensive
- drugs that are particularly useful in older people. Side-effects include
- flushing, palpitations and fluid retention.

- Beta-blockers These are no longer used as first-line antihypertensive
- therapy, except in patients with another indication for the drug
- such as angina. Metoprolol (100–200 mg daily), atenolol (50–100 mg
- daily) and bisoprolol (5–10 mg daily)

Thank you