HYPERTENSION

Year One

Hypertension is a blood pressure of 145/85 or greater taken while seated at rest.
Definitions vary slightly between experts.

Higher levels acceptable with advanced age
(eg. up to 160/90 in those over 75 years of age).
Low levels at this age may cause postural hypotension.

BP should drop slightly when standing up. A drop of over 10mm Hg is pathological.

A pressure of 160/100 mmHg is associated with a
threefold risk of mortality under 65 years

SYMPTOMS - HISTORY - QUESTIONING

First presenting symptom of undiagnosed hypertension may be a myocardial infarct (MI - heart attack) or cerebrovascular accident (CVA - stroke).

Headache (typically worse in early morning)

Very high or chronic hypertension may cause nausea, confusion, malaise, anxiety, dyspnoea or angina

Hypertension is more a risk factor than a disease. Everyone over 40 should have a BP recorded by their GP.

RISK FACTORS

Genetic history. Parents, siblings, children.
Obesity.
Smoking.
Salt intake.
Alcoholism.

SIGNS – EXAMINATION

Sphygmomanometer. Mercury, anaeroid, electronic.

Korotkoff sounds - the sounds heard through a stethoscope when taking a blood pressure. A total of four sounds and silence can be identified, which determine the systolic and diastolic blood pressures of the patient. They were described by the Russian physician Nickolai Korotkoff (1874-1920) (further details below).

Essential to use a large cuff if obese, small cuff in child.

Do not use on arm if woman has had axillary lymph node dissection for breast cancer - may trigger lymphoedema.

May be taken on leg using large cuff if both arms injured.

OTHER SIGNS

Apex beat displacement, retinal arteriovenous nipping, exophthalmos (with malignant hypertension), papilloedema, pulsus alternans, retinal exudates, retinal haemorrhages, Osler's phenomenon (see below).

INVESTIGATIONS - PATHOLOGY, RADIOLOGY ETC.

A pathological cause for hypertension should be excluded by selection from the following tests: U.microscopy and culture, blood haemoglobin (Hb), B.urea, S.creatinine, S.electrolytes, S.uric acid, B.cholesterol and triglycerides, B.glucose, electrocardiogram (ECG), renal ultrasound, intravenous pyelogram (IVP).

Additional tests if clinical suspicion of further pathology exists could include thyroid function tests, U.catecholamines, U.renin, dexamethasone suppression test, insulin resistance, echocardiography

In women, ALWAYS determine if they are pregnant if hypertension present.

POSSIBLE CAUSES

Generally due to increased peripheral resistance, abnormalities of the renin-angiotensin-aldosterone system, increased levels of adrenaline or noradrenaline, or increased cardiac output (eg. thyrotoxicosis).

COMMON

Anxiety (white coat hypertension), exercise, essential hypertension (90% of all cases).

UNCOMMON

Renal artery stenosis, acute and chronic glomerulonephritis, polycystic kidneys, nephrotic syndrome, other renal diseases, pre-eclampsia of pregnancy, alcoholism, drugs (eg. analgesics, anorectics, antidepressants, cyclosporin, carbenoxolone, liquorice, MAOIs, NSAIDs, oral contraceptives, steroids)

RARE

Phaeochromocytoma, aortic coarctation, hyperthyroidism, raised intracranial pressure (tumour or trauma), overdistended neurogenic bladder, polyarteritis nodosa, systemic lupus erythematosus (SLE), scleroderma, Conn syndrome, malignant hypertension, Cushing syndrome, porphyria, ovarian tumours, lead poisoning, diabetes mellitus, pseudohermaphroditism, adrenogenital syndrome, Liddle syndrome, Irukandji syndrome, Riley-Day syndrome, drug and food interactions (eg. MAOIs and cheese).

TREATMENT

1. Withdraw exacerbating drugs, (eg. oral contraceptives, NSAID).
2. Stop smoking, reduce alcohol, reduce salt intake, reduce weight if obese, check cholesterol.
3. Reduce stress and anxiety. Relaxation techniques.
4. Drug treatment

Hypertension and -	Use first	Use Second	Avoid
No risk factors	A or A2	C, D	
Cardiac failure	A or A2	D	C
Peripheral vascular disease	C,D	A	
Ischaemic heart disease	B	C	
Renal disease	A or A2	D	
L. ventricular diastolic failure	A	B,C	
Post stroke (CVA)	A or A2	D	
Bradycardia	A	D	B, C
Tachycardia	B	C	
Conduction disease	A or A2	D,C	
Hyperlipidaemia	A,C		
Diabetes	A or A2	C	B, D
Asthma	A,C	D	B
Constipation	A,B		
Depression	A,C	D	B
Impotence	A,C		
Venouse hypertension	A,D	B	
Raynaud's phenomenon	C	A,D	
Gout	A,C		D

A = ACE inhibitor A2 = Angiotensin II receptor antagonists B = Beta-blocker
C = Calcium antagnoist D = Diuretic (thiazide)

5. Other drugs (eg. angiotensin 2 receptor antagonists, moxonidine, methyldopa, alpha-blockers).
6. In resistant cases minoxidil OR hydralazine OR clonidine.
7. In extremis use diazoxide IVI.
8. For pheochromocytoma use phenotolamine.

THIS TREATMENT SCHEME IS MODIFIED FREQUENTLY AND WILL ALMOST CERTAINLY CHANGE BY THE TIME YOU START PRESCRIBING.

ADDITIONAL INFORMATION

Angina

Angina pectoris (acute coronary syndrome) is pain caused by an inadequate blood supply (ischaemia) to part of the heart muscle due to a narrowing of one or more of the three small arteries that supply blood to the heart muscle. This narrowing may be due to hardening of the arteries, or a spasm of the artery caused by another disease, smoking, excitement, heavy meals or stress. Angina may lead to a heart attack, or a heart attack may cause angina, but they are two different problems. In a heart attack, part of the heart muscle dies.

Apex Beat Displacement

Palpation of chest wall with flat of finger tips to detect point of maximal cardiac pulsation. This is normally 7 to 10 cm to left of midline in 5th intercostal space.

Displaced to left – Cardiomegaly (eg. valvular disease,hypertension, pulmonary disease, cardiomyopathies, congenital heart disease, aneurysm,rheumatic fever), pulmonary fibrosis, scoliosis, pectus excavatum, elevated diaphragm, bronchiectasis, Keshan disease

Displaced to right – Pneumothorax, pleural effusion, dextrocardia

Commonly due to cardiac or pulmonary disease

Dyspnoea

The medical term dyspnoea means shortness of breath.

Exophthalmos (Proptosis)

Protrusion of eyeballs within sockets. Marked amount of sclera visible above iris in normal forward vision

Causes include hyperthyroidism, cerebral tumour, optic or orbital tumour, Cushing's disease, cavernous sinus thrombosis, Hand-Schueller-Christian disease, pituitary tumours, osteomas, neurofibromatosis, Wegener's granulomatosis, metastatic carcinoma, xanthomas, malignant hypertension, uraemia, cellulitis, vascular malformation, lacrimal tumours, mucocele, rhabdomyosarcoma, Apert syn., Crouzon syn., Sturge-Weber syn.

The appearance is due to an increase in the volume of orbital contents

Intravenous pyelogram (IVP)

An intravenous pyelogram (IVP) or intravenouspyelography, is an x-ray or CT scan of the kidneys and the urinary system. The soft tissues of the kidneys and the ureters (the tubes leading from the kidneys to the bladder) do not show up well on a plain X-ray, so an iodine compound which is opaque to X-rays is injected into the patient. The dye is normally injected into a vein (intravenous injection) in the arm and travels through the bloodstream until it reaches the kidneys a few seconds later, when the X-ray is taken. The harmless dye is then removed from the blood by the normal filtering process of the kidneys so that it becomes part of the urine and is eliminated from the body.

The pyelogram shows the sizes of the kidneys and ureters, whether their shape and function are normal, and the position of any stone. If there is a stone blocking one of the ureters, only the kidney and that part of the ureter above the blockage shows.

A tight belt around the belly compresses the ureters for the first few minutes of the procedure and concentrates the dye in the kidneys. When the belt is released, the X-rays show the dye flowing down the ureters to the bladder.

Korotkoff sounds

There are five sounds which are heard as the pressure in the syphgmomanometer cuff is released during the measurement of arterial pressure. These are described as:

* Korotkoff I is a sharp tapping - pressure at this point is systolic pressure.
* Korotkoff II is a loud blowing or swishing sound. Sometimes, if the cuff is deflated too slowly, the sounds vanish temporarily. This happens when the blood vessels beneath the cuff become congested, and is often a sign of hypertension. The congestion eventually clears, and sounds resume. The intervening period is called the auscultatory gap.
* Korotkoff III is a soft thudding sound due to increased blood flow.
* Korotkoff IV is a soft blowing and muffling of sound. May be used as diastolic point if it continues to very low pressure before silence.
* Korotkoff V is silence - pressure at this point is diastolic pressure.

Malaise

Malaise is a term used to describe a feeling of being generally unwell, but with no specific symptoms.

Osler's Phenomenon

Inflate sphygmomanometer to level that obliterates radial pulse. Positive if a sclerotic radial artery can be palpated against the underlying radius. Indicates presence of significant arteriosclerosis which may result in overestimation of systolic blood pressure

Papilloedema

On ophthalmoscopic or slit lamp examination, the optic disc is noted to be flattened, swollen or protruberant bilaterally with blurred edges. Absent venous pulsation, dilated retinal veins, and flame shaped haemorrhages may also be noted

May be due to increased intracranial pressure (eg. haemorrhage, tumour, meningitis, cerebral abscess, emphysema, hypoparathyroidism), optic neuritis,hypertension, multiple sclerosis, Guillain-Barré syn.

The cause is increased CSF pressure, due to an increase in CSF volume (caused by haemorrhage or increased protein content) or blocked CSF circulation, is transmitted along the sheath of the optic nerve to the optic disc. Vision remains unimpaired in early stages

Pulsus Alternans

An alternate variation in size of pulse wave, often detected by sphygmomanometry.

May be due to paroxysmal tachycardia, left ventricular failure, cardiomyopathy,hypertension, ischaemic heart disease

Not all fibres of myocardium able to contract with each beat due to disease causing this phenomenon.

Retinal Arteriovenous Nipping

Ophthalmoscopic or slit lamp examination of the retina reveals narrowing of venules where they are crossed by arterioles. It indicates hypertension, arteriosclerosis. The cause is increased pressure on the venule in the shared adventitial sheath where vessels cross.

Retinal Exudates

Ophthalmoscopic examination of retina reveals white fluffy patches

May be due to diabetes mellitus,hypertension, increased intracranial pressure, massive blood loss

Caused by occlusion of retinal capillaries

Retinal Haemorrhages

Red spots and patches adjacent to blood vessels are noted on ophthalmoscopic examination of the retina. Various types described as punctate, splinter and flame

May be due to pernicious anaemia, leukaemia, aplastic anaemia,hypertension, diabetes mellitus, bacterial endocarditis, anticoagulants, haemorrhagic disease

Caused by damaged retinal capillaries

CURIOSITY

Pickwickian syndrome

The Pickwickian syndrome is named after the extraordinarily obese Dickens character, and is a complication of being seriously obese that usually occurs in women. Patients have significant shortness of breath, gross obesity, tiredness, blue skin (cyanosis), shallow breathing, cor pulmonale, ***high blood pressure*** *(hypertension) and heart failure*

Totally, completely and utterly useless medical information

LIQUORICE

Liquorice is a herbal remedy that is used orally to treat lung and throat infections. Clinical trials show some effectiveness for these viral conditions. Its main adverse effects are ***increased blood pressure****, swelling of tissue and blood chemistry abnormalities (low potassium). It may interact with diuretics (fluid tablets), nitrofurantoin, digoxin and prednisone.*

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