

Hypertension in Adults: Part 1. Prevalence, types, causes and effects

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Introduction

Arterial hypertension is a common and preventable cardiovascular risk factor, leading to about 1.7 million deaths/year worldwide.

Prevalence

The incidence and prevalence of hypertension depends upon the racial composition of population and criteria used to define hypertension (see Table 1). The prevalence of hypertension in the USA ranges from 4% in 18-29 years olds to 65% in those aged 80 years and over. Prevalence of hypertension in South Sudan is unknown but a review of studies in sub-Saharan Africa¹ showed it was higher in urban than rural areas and, like other races, increased with age. In most studies reviewed:

- Less than 40% of people with blood pressure above the defined normal range had been detected
- Of people with previously diagnosed hypertension, less than 30% were on drug treatment.

Table 1. Classification of BP levels (according to The British Hypertension Society)

Category	Systolic BP (mm Hg)	Diastolic BP (mm Hg)
Optimal	< 120	< 80
Normal	< 130	< 85
High Normal	130 - 139	85 - 89
Grade 1 (mild)	140 - 159	90 - 99
Grade 2 (moderate)	160 - 179	100 - 109
Grade 3 (severe)	≥ 180	≥ 110

Hypertension occurs more frequently in 'black' compared to 'white' populations and is associated with:

- A higher incidence of cerebrovascular and renal complications
- A greater tendency to develop left ventricular hypertrophy
- Enhanced sodium retention with a higher incidence of salt-sensitive hypertension, expanded plasma volume and A higher prevalence of low plasma renin activity.
- Reduced sodium-potassium ATPase activity with a tendency towards increased intracellular sodium and calcium concentrations

- Greater frequency of proteinuria.

Types of hypertension

There are two types:

1. Primary or essential hypertension (97-98%) has no clear underlying cause but appears to be the result of an interplay of complex genetic and environmental factors.
2. Secondary hypertension (2-3%) is caused by a specific underlying mechanism usually involving kidneys or endocrine system.

Mechanisms in primary hypertension

Several patho-physiological mechanisms contribute to the development of primary hypertension. The factors include:

- Genetics
- High salt intake
- Low physical activity
- Obesity
- Insulin resistance
- Renin – angiotension system
- Sympathetic nervous system
- Intrauterine nutrition and low birth weight

Causes of secondary hypertension

These are unusual but are important because the cause may be curable:

1. Endocrine causes:
 - Cushing's syndrome
 - Conn's syndrome
 - Pheochromocytoma
 - Hyper / Hypothyroidism
 - Acromegaly
 - Hyperparathyroidism
 - Exogenous hormones, e.g. contraceptive pills, glucocorticoids.
2. Renal causes:
 - Glomerulonephritis
 - Diabetic nephropathy
 - Polycystic kidney disease
 - Renal artery stenosis.
3. Other causes:
 - Coarctation of the aorta
 - Pregnancy associated hypertension
 - Alcohol
 - Acute stress.

Effects of Hypertension

Damage to organs (end organ damage) appears in two main forms:

1. Obstruction to arterial blood flow: atherosclerosis causing cerebral infarction ("stroke"), coronary and peripheral arterial disease.
2. Rupture of arteries: e.g. cerebral haemorrhage ("stroke") and aortic dissection.

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Organ damage can also result from drugs used for treatment of hypertension. Other common complications of hypertension include:

- Atrial fibrillation
- Left ventricular hypertrophy and failure
- Kidney damage leading to failure
- Retinopathy.

Risk Factors for a poor prognosis in hypertension

- Black race
- Youth
- Male gender
- Persistent diastolic BP > 115 mm Hg
- Smoking
- Diabetes Mellitus
- Hypercholesterolaemia
- Obesity
- Excess alcohol intake
- Evidence of end organ damage.

References

1. Addo J, Smeeth L & Lean DA 2007 Hypertension in Sub-Saharan Africa: A Systematic Review *Hypertension*. 2007;50:1012.
<http://hyper.ahajournals.org/cgi/content/abstract/50/6/1012>)

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What do you know about the Juba Teaching Hospital/St Mary Hospital UK Link?

The objective of the link between Juba Teaching Hospital (JTH) and St Mary's Hospital on the Isle of Wight is: "To promote understanding of the needs and to support the Government of Southern Sudan, in order to improve clinical services through the development of education and training."



Over the past year trainers from St Mary's have supported the following activities at JTH:

- a 3-day workshop for midwives,
- a week long course in Applied Surgical Physiology
- a course in Trauma Management
- a needs assessment in psychiatry and daily teaching in psychiatry for the medical assistants and a review of educational needs.

In addition 2 trainee doctors from UK had a 4-month attachment to Juba Teaching Hospital where they undertook a major review of the functioning of the Emergency Unit and provided teaching to the local healthcare professionals – see photo.

News of the latest 2009 visit from trainers to JTH will be in the next issue of the Bulletin. And we will tell you about some fundraising activities on the Isle of Wight. For more information email eluzai_hakim@yahoo.co.uk or twalsh721@btinternet.com.
