

Hypertension

Pathology Team

These are the companion notes
for the HANDOUTS given by Dr. Sufia Hussain
You can study from: Them + The Pathology Handouts

N.B. The”  “means it is an important MCQ

This was made by:

Dona Baraka - Nourhan Al-Shamma' - Dina Al-Kuhaimi - Sara Al-Husain.

In Cooperation with:

The Male's Pathology Team:

Abdullah Al-Faris - Muhammad Al-Harbi

Aban Al-Bahebry - Abdulrahman Al-Johar

Hypertension:

Silent Killer: it is Painless, Asymptomatic (has no symptoms) but a person could DIE from it if they wasn't treated/stopped.



What is the most organ that will be affected/damaged in hypertension? The heart

Ranges:

Diastolic > 98mmHg. Systolic > 139mmHg.
If it passes these ranges, we call it Hypertension.

p.s. diastolic is the most important in determining the cause/disease of HTN.

Primary (essential) Hypertension:

Has no identifiable or direct cause although the risk factors increase the possibility of having HTN

→ It is **Multifactorial** we don't know its causes.

Secondary Hypertension:

A results of an identifiable cause. This type of HTN is **treated differently than essential type** by treating the underlying cause.

DISEASES THAT WOULD CAUSE HYPERTENSION (secondary Hypertension)

Glomerulonephritis: nephritis characterized by inflammation of glomeruli

Renal Artery Stenosis: no blood supply (BP) to kidney → **Atrophic Kidney** (smaller)
this activates "rennin angiotensin system"

Adult polycystic Disease (bubbles in kidney) → **Hypertrophic Kidney** (4 times bigger than normal size of a kidney)

Chronic Renal Disease – Renin Producing tumors (rennin activates "angiotensin")

Thyrotoxicosis: overactive tissue within thyroid gland/ ↑thyroid hormone

Primary Aldosteronism: overproduction of : "**Mineralocorticoid**" hormone (produced by adrenal gland)
"**Aldosterone**" hormone (produced by adrenal gland)

Cushing's /hypercorticism-hormone disorder:

↑ Cortisol in blood → bcuz of a tumor (adenoma) in pituitary gland that produce **ACTH**

Acromegaly:

A chronic disease, marked by enlargement of *bones of extremities – Face – Jaw*
Caused by: overactivity of pituitary gland

Pheochromocytoma:

Neuroendocrine tumor of the medulla of the "Adrenal Gland"
secretes "catecholamines", "noradrenaline" and "adrenaline" that increase the sympathetic tone (↑ H.R → ↑B.P)

Coarctation of the Aorta: narrowing of the Aorta

Kidney Failure will cause → **Hypertension** // **Hypertension** will cause → **Kidney Failure**

Mineralocorticoid: ↑ water retention ⇒ ↑ B. Volume → HTN

Aldosterone: Anti-diuretic hormone (prevents going to the bathroom) ↑ water retention ⇒ ↑ B. Volume ⇒ ↑ B.P

High Intracranial B.P. → High B.P. in all body

Benign Hypertension: More common

Malignant Hypertension:

NOT a tumor, cannot be treated and it causes DEATH



A severe (Malignant) Hypertension is Associated with: Diastolic pressure over 120mmHg.



Why is - Malignant HTN could cause “Cerebrovascular accidents”??

When blood supply is diminished → necrosis happens in a part of the brain → cause paralysis.

Stroke: no blood supply to brain

Papilledema: High pressure in the EYE

Retinal Hemorrhage: نزيف في شبكة العين



Hypertensive Risk Factors: Factors that increase the risk of having Hypertension

age – elderly – smoking – gender (more in males) – diabetes – Color (Africans)
obesity – alcoholism – hypercholesterolemia (high cholesterol) – Hereditary

Regulation

Aldosterone ⇒ ↑ B.P

Sympathetic Effect: Vasoconstriction

Parasympathetic Effect: Vasodilation

Heart rate & Contractility: (depending on multifactorials)

↓ Contraction ⇒ ↓ Blood Pressure

Etiology = Causes

“Postulated mechanisms of Essential Hypertension” are more likely predicted to be the reason for it.

Angiotensin’s Functions:

- 1- Vasoconstriction (increase in B.P.)
- 2- Stimulate “aldosterone” hormone

Morphology:

-Sclerosis= Thickening



1) Hyaline Arteriosclerosis (in diabetic patients):

Associated with “pink hyaline narrow lumen”

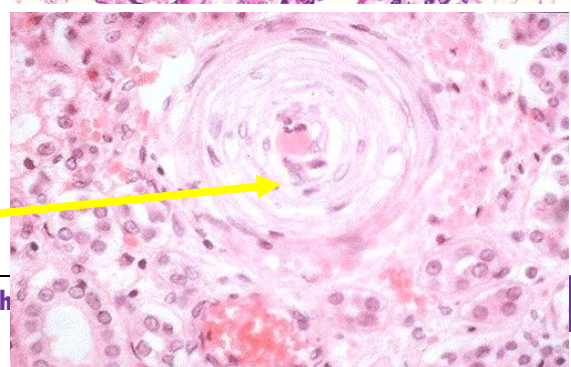
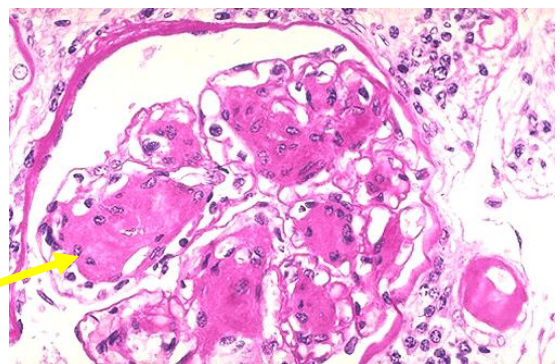


2) Hyperplastic Arteriosclerosis (in malignant Hypertension):

Associated with “Necrotizing Arteriolitis”

(necrosis in blood vessels is always **Fibrinoid Necrosis**)

Anterior Line is markedly **THICKENED** and lumen is **NARROWED**



Organ Damage (due to HTN generally)

HTN \Rightarrow \uparrow Peripheral Resistance

\Rightarrow resistance in all branches and in Aorta \Rightarrow \uparrow B.P in aorta \Rightarrow \uparrow Lt. Ventricle Contraction

\Rightarrow **Left Ventricle Hypertrophy (LVH)**

HTN \Rightarrow \downarrow Lt. ventricular pressure overload (because of hypertrophy- JUST THICKENING)

\Rightarrow \uparrow weight of the Heart \Rightarrow \uparrow overall cardiac size

\Rightarrow Thickness in Lt. Ventricle **impairs** diastolic filling

\Rightarrow **Left Atrial Enlargement**



Factors indicating Adverse Prognosis in Hypertension

