endothelium cells & 4 Function

By ranem

↳ direct contact with blood

1- smooth blood flow (minimize friction)

2- maintain vascular tune < contraction (Balanced)
relaxation

vasoconstricting + vasodilation happens in tunica media
(vaso motor center) ↳ smooth muscles / elastic fibers

How ?! two ways

a secrete vasoconstrictors and vasodilators by itself

regulation of BP is 3 types: 1- Auto regulation
2- short term regulation
3- long term regulation

b transcytosis

substances → endothelial cells → basement membrane → interna elastic lamina

through transocytosis

(endocytosis)

exocytosis

tunica media

(elastic fibers)

↳ atherosclerosis تصلب الشرايين

تختزن

tunica externa (support) protection

3- coagulation regulation

grow coagulation factors / anti coagulation Factors

→ grow inflamatory factors / anti inflamatory Factors

↳ Balanced

4- inflammation regulation

- إلي يعم الدكتورة بالأمتحان -

- branching of blood vessels (بالترتيب مهم)

- تسجيل diameter كل ما انتقلنا downward

- علاقة blood pressure + blood flow لما نكون قريب للقلب وبعيد عنه

- the 3 layers of blood vessels (كلهم)
- the 4 functions of endothelial cells

smooth muscles (in tunica media) مسؤول عن vaso constriction
vaso dilation

① RAAS

bloodflow to Kidneys ↓ → renin يفرز هرمون

by juxtaglomerular cells

bloodflow to liver ↓ → angiotensin تفرز هرمون

renin يحول angiotensin I إلى angiotensin II

lungs تنتج أنزيم Angiotensin-converting enzyme ← وظيفتها

↳ convert angiotension I to angiotension II

يحفز هرمون Aldosterone → reabsorption

water / sodium ↓

distal convoluted tubule في

collecting duct ↓

capillaries ↓ رجع

↳ renal vein → posterior vena cava (right atrium)

method (2) in regulating BP↑

proximal convoluted tubule : عن طريق reabsorption تعمل نفس Angiotensin II

(3) sympathetic NS : centrally dilation

peripherally constriction (Angiotensin II)

(4) minimize vasodilators hormones (Atrial natriuretic peptide)

vasopressin ADH (anti diuretic hormone) → Function Reabsorption (water + sodium)

BF ↓ ← تحفز (thirst centers) لإشارة الدماغ

osmoreceptors in hypothalamums → posterior pituitary gland ← تفرز (ADH)

↓ action potential لـ

reabsorption through distal convoluted tubule + collecting duct

BF BP ↑ (Hypertension)

يزيد هرمون Atrial natriuretic peptide من right atrium ليزيل الضغط

Blood volume ↓ → Angiotensin II activation → Aldosterone activation → EP/NOREP activation

antidiuretic hormone activation → Atrial natriuretic peptide Inhibition

Blood volume ↑ → أعكس إلى فوق

BP ↑ hypertension أدوية لعلاج

- angiotensin - converting enzyme inhibtor
- diuresis
- angiotensin II inhibtor (antagonist)
- Beta blocker