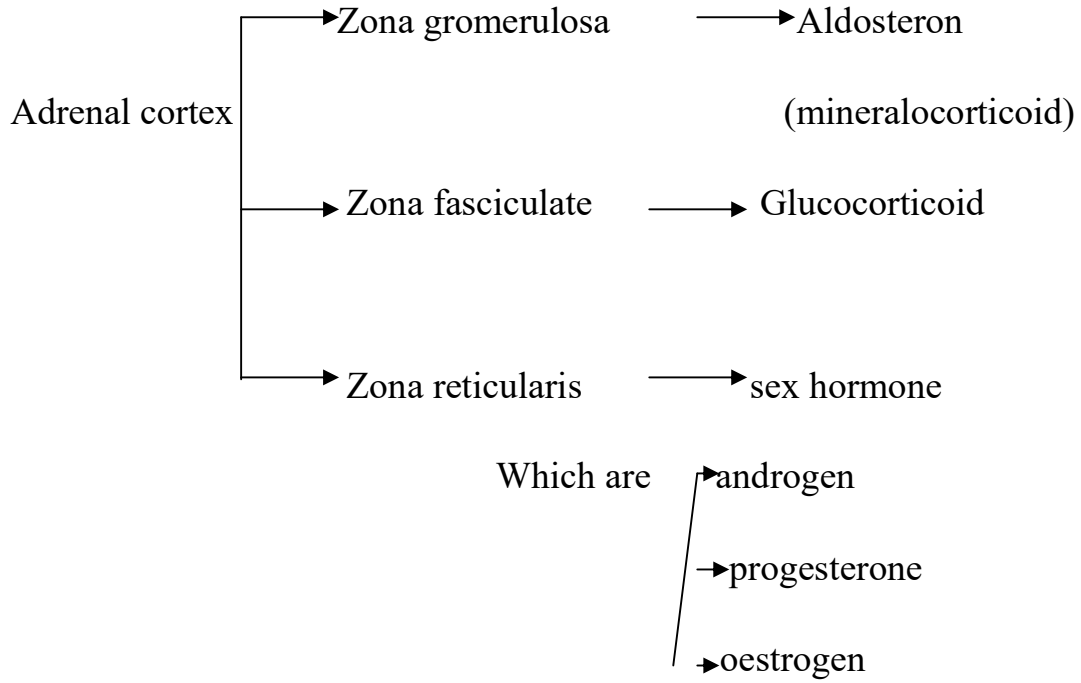
Supra renal gland:

It has two parts :

Outer part the adrenal cortex secret corticosteroid have no nerve supply :-

Inner part the adrenal medulla secret adrenalin 80% and nor adrenalin 20% nerve supply by greater splanchnic nerve.



Zona glomerulosa:

Secret aldosteron (mineralocorticoid)

Action of aldosteron :

1- Increase reabsorption of Na^+ by renal tubule therefore maintain normal level of Na^+ in ECF (extra cellular fluid) and increase excretion of K+ by renal tubes usually absorption of Na^+ accompanied by absorption of an equivalent amount of water by renal tubules. Therefore the osmotic pressure remain uncharged. On

the other hand decrease aldosteron accompanied by decrease Na^+ in ECF and also decrease in water with an equivalent amount therefore osmotic pressure remain uncharged.

2- Secretion of aldosteron is not under the control of ACTH but it is under the control of angiotensin level in blood.

   So that if plasma K+ increase resulted in increase secretion of aldosteron result in an increase in K+ excretion by kidney (feedback mechanism)

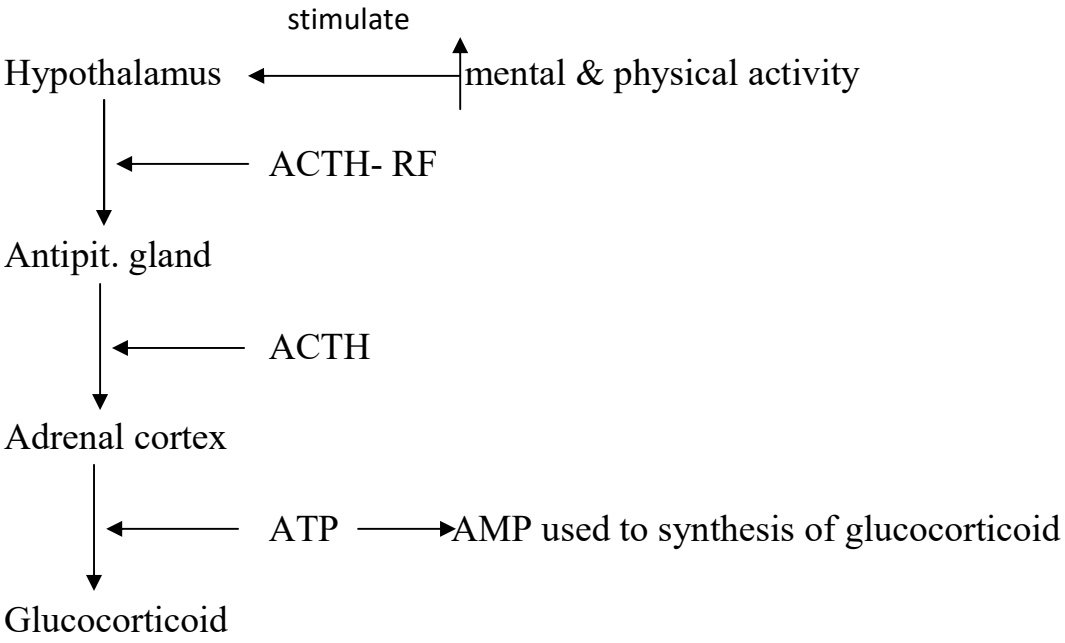
3- Abnormal increase secretion of aldosteren Cause increase loss of k from plasma when it decrease to half (normally the value of k is 4.5 meq\L) resulted in hypokalemia in which there is muscle paralysis sever muscle weakness.

4- Abnormal decrease secretion of aldosteron cause k in plasma when it to double resulted in hyperkalemia with cardiac toxicity, Arrhythmia & decrease contraction of cardiac muscle

II. Zona Fasciculata :

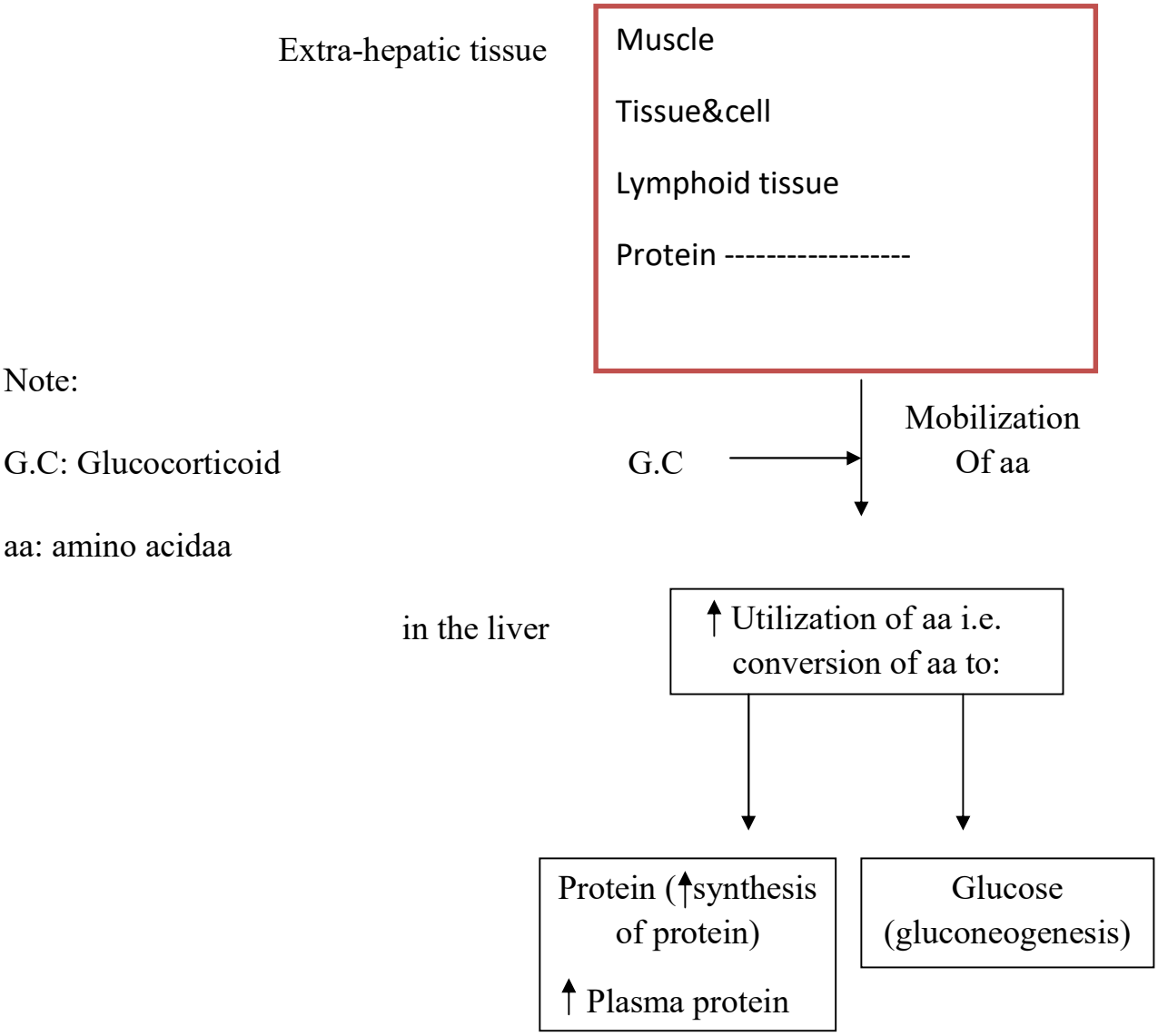
Secret Glucocorticoid hormone its name is because it increase glucose level in the blood .abaut 2% of cortisol circulat in free form and the major part is bound to plasma protein mainly to globulin .

The secretion of Glucocorticoid is under the control of ACTH as follow:


stimulate
Hypothalamus
mental & physical activity
ACTH- RF
Antipit. gland
ACTH
Adrenal cortex
ATP
AMP used to synthesis of glucocorticoid
Glucocorticoid

Function of glucorticoid Hormone :

1) Effect of glucocorticoid on protein metabolism :



Note:

G.C: Glucocorticoid

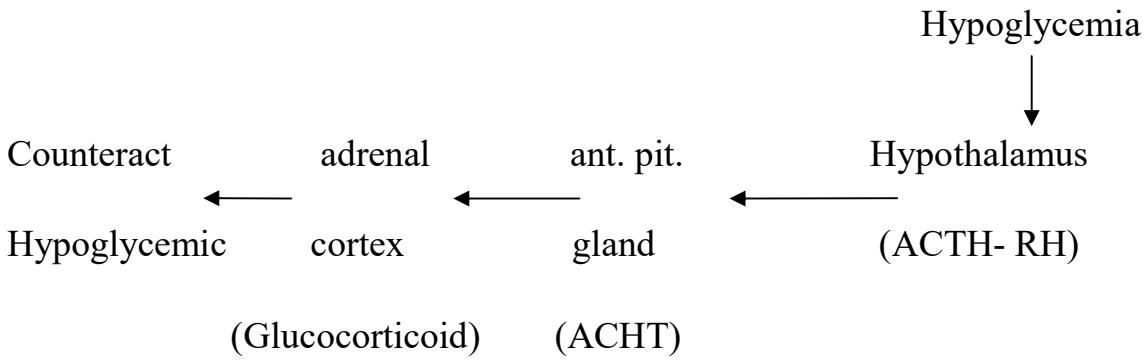
aa: amino acidaa

Therefore G.C have following effect:

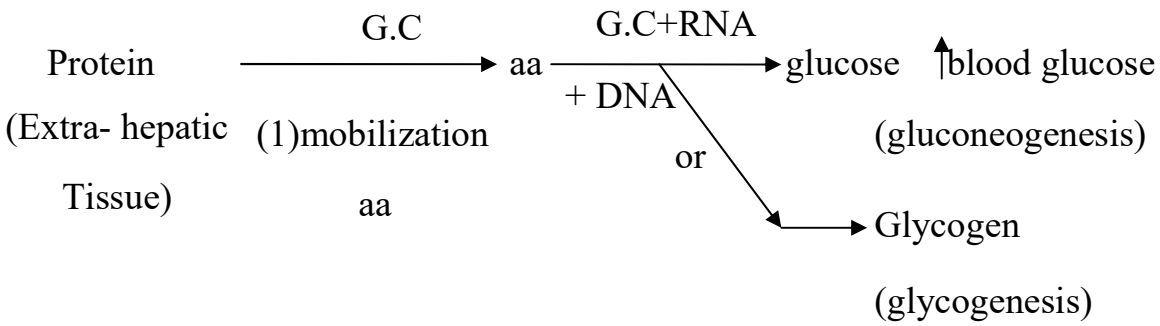
1. ↑Utilization of aa by the liver.
2. ↑ Protein synthesis by the liver.
3. ↑Formation of plasma protein by the liver.

2) Effect of Glucocorticoid on CHO:

a. Anti hypoglycemic effect:



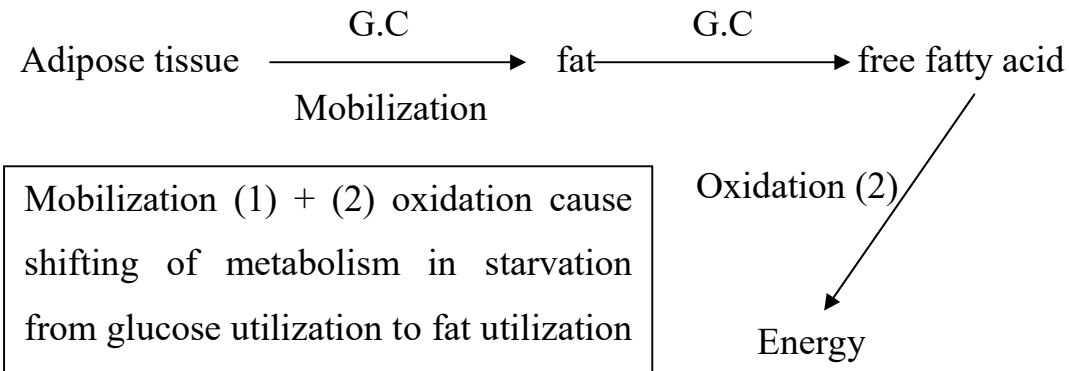
b. Stimulate Gluconeogenesis



Therefore action of G.C on CHO:

1. ↑ Mobilization of aa from protein.
2. ↑ Activation of RNA, DNA necessary for conversion of aa to glucose in the liver (or glycogen).
3. ↑ Utilization of glucose by the cell.

3) Effect of G.C on fat:



Mobilization (1) + (2) oxidation cause shifting of metabolism in starvation from glucose utilization to fat utilization to produce energy.

4) Effect on mineral metabolism:

Similar to aldosterone it increase Na+ retention and increase K+ elimination with 1/10 effect of aldosterone.

5) effect of G.C on water balance:

Increase retention of water and increase retention of Na+ with increase GFR so no oedema formation . because increase GFR will counteract water retention.

6) effect on respiratory system:

Inter in formation of surfactant in intrauterine. Life when surfactant decrease it result in respiratory distress syndrome.

7) Effect on CVS:

Increase arteriolar tone response to sympathetic activity. So hypertension may result from overactivity of adrenal cortex and hypotension due to adrenal cortex insufficiency.

8) effect on haemopoietic & lymphoid tissue:

It affect lymphoid tissue to decrease production of AB(antibody) against his own tissues. Also it suppress AB formation to foreign protein e.g kidney transplant to decrease allergic process.

9) effect on GIT:

Decrease resistance of gastric mucosa to HCL so may cause peptic ulcer. Also it prevent absorption of vitamin D from intestine.

10) effect on bone: ↓ bone matrix (osteoporosis) catabolic effect on protein because protein enter in formation of bone matrix.

↑

Abnormal action of adrenal cortex:

1. Increase secretion of glucocorticoid hormone known Cushing's syndrome.
2. Decrease secretion of glucocorticoid hormone known as Addison's disease.