HYPOTHALAMUS & PITUITAY GLANDS.

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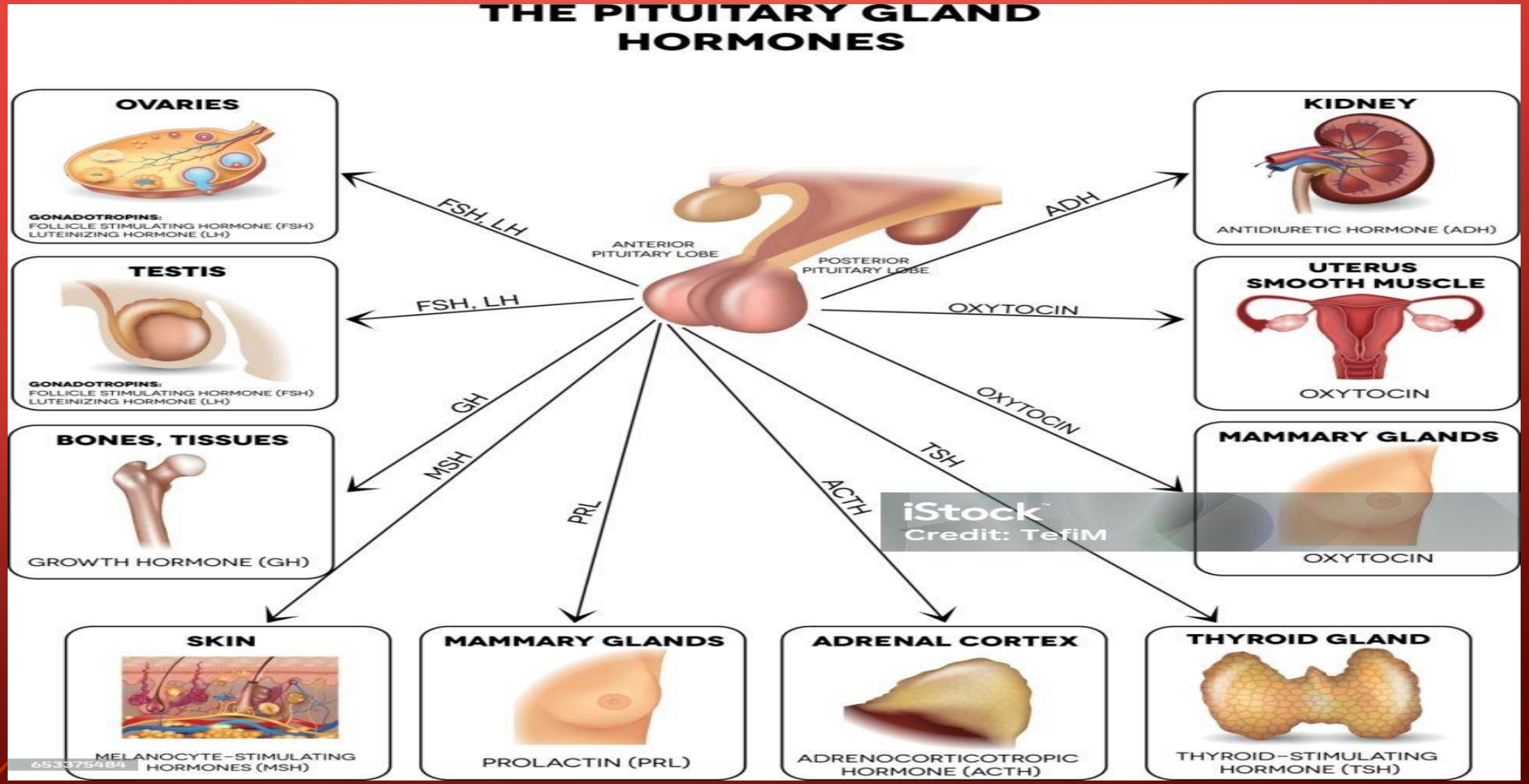
CLASSIFICATION

- The pituitary gland is located in the sella turcica above the cavernous sinus in the skull , & it is connected to the hypothalamus by the pituitary stalk which convey nerve axons to the posterior part of the gland. It also surrounded by portal circulation to transport the messenger hormones from the hypothalamus produced by different stimuli , to control pituitary hormone production according to the body needs.
- Any disease which affect the hypothalamus , will eventually cause pituitary gland dysfunction , mainly though hormonal derangement, but sometimes by direct pressure effect on the stalk or the pituitary gland itself.
- The anterior pituitary gland is a complex structure , it contains mainly 2 types of cells (basophils & acidophils) , which are subdivided to 5 different cell types (samatotropes,thyrotropes lactotropes, corticotropes & gonadotropes)& folliculostellate cells, each cell type produces specific hormone.
- In cases of pituitary tumors , the size of the tumor assists in its classification ,(Macro > 1cm , Micro – adenoma < 1cm) , which has practical implication for future therapy (surgical or non-surgical).

HYPOTHALAMUS & PITUITARY GLAND



CLASSIFICATION

- 1-Non- functioning tumors (pituitary adenoma, craniopharyngioma, metastasis).
- 2- Hormone excess a- anterior pituitary (prolactinoma, acromegaly ,Cushing's disease, FSH & LH secreting adenoma).
- b-hypothalamus (syndrome of inappropriate ADH secretion).
- 3- Hormone deficiency a- anterior pituitary (hypopituitarism).
- b- hypothalamus & posterior pituitary (Cranial diabetes insipidus).
- Hormone resistance (GH resistance leading to dwarfism, Nephrogenic diabetes insipidus.

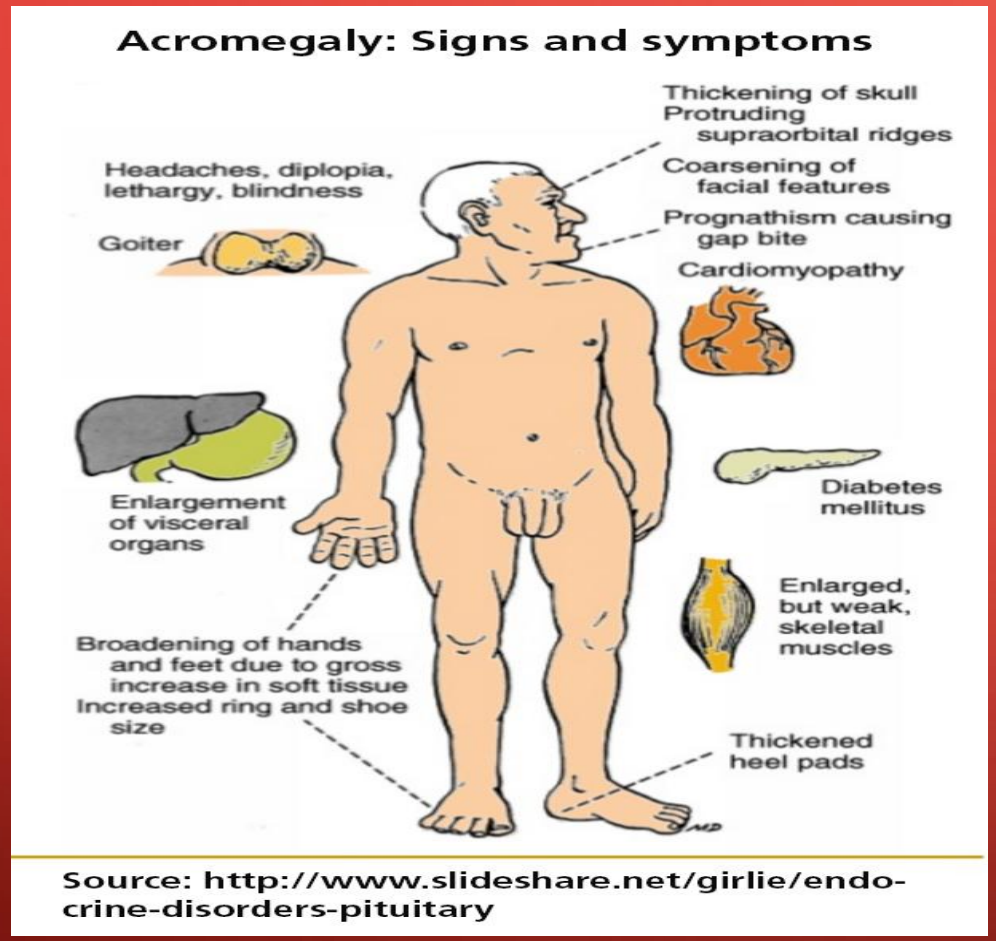
DISEASES CAUSED BY SPECIFIC HORMONE DERANGEMENTS

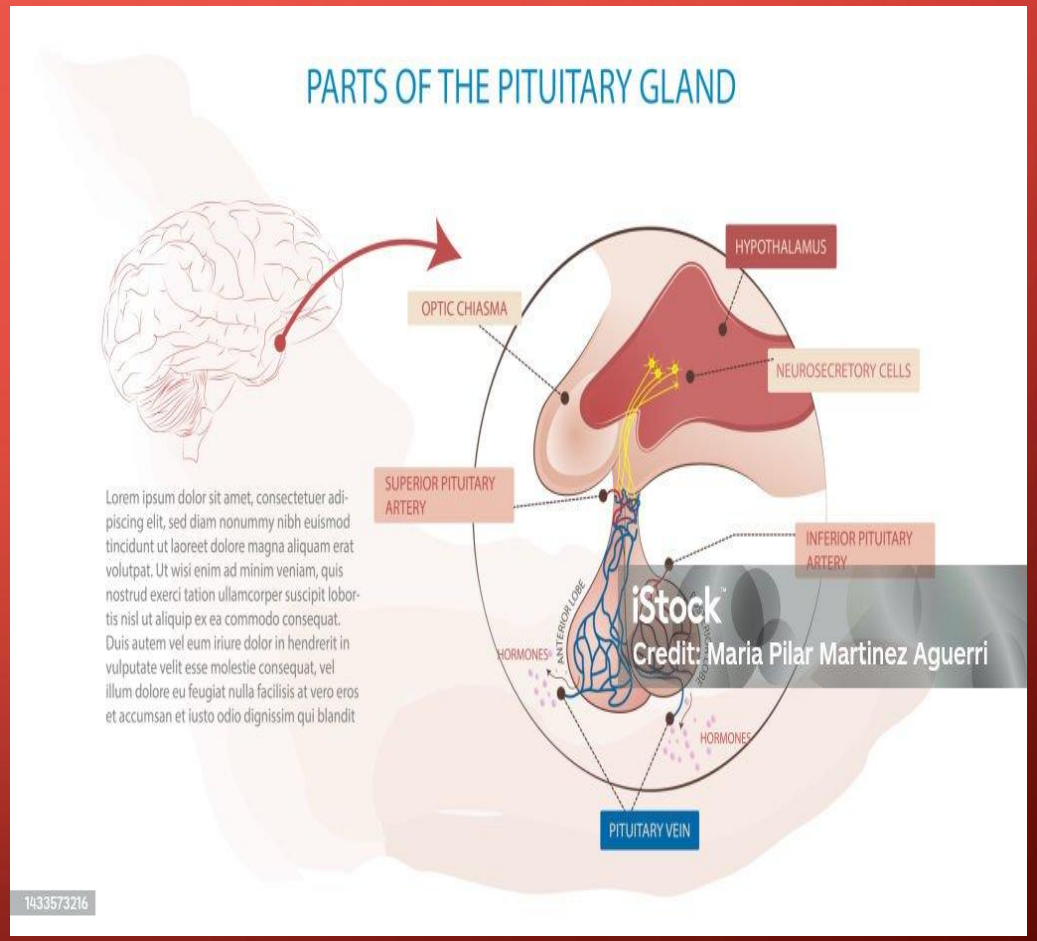
- GH , its excess leads to acromegaly or gigantism, while the deficiency causes dwarfism .
- Prolactin , its excess leads to infertility in male & female. Due to loss of inhibitory effect from hypothalamus or non- functioning pituitary tumors.
- ACTH , its excess leads to Cushing‘s disease, & hypoadrenalism
- ADH, its deficiency or end organ resistance can cause diabetes insipidus (cranial or nephrogenic).
- TSH deficiency causes hypothyroidism, while its excess can lead to thyrotoxicosis.
- FSH & LH deficiency causes male & female infertility .
- Non functioning tumors can cause panhypopuitarism (multiple disease conditions).-

ACROMEGALY & GIGANTISM

- This disease is due to excess GH production from the anterior pituitary gland.
- If the overproduction occurs before the closure of epiphyseal growth plate , this will cause gigantism , & the patient will gain excessive height , will normal body contours. While if this excess GH production occur after the closure of the epiphyseal growth plate , this will leads to acromegaly , as the bone have no chance to increase in linear fashion . So the patient will develop coarsening of the facial features (increased frontal bossing , enlarged base of the nose ,thickening of nasolabial sulcus & lips , parotid hypertrophy , prognathism , widening of space between the teeth). Large spade shaped hands & large feet , organomegaly with skin changes.

ACROMEGALY & GIGANTISM

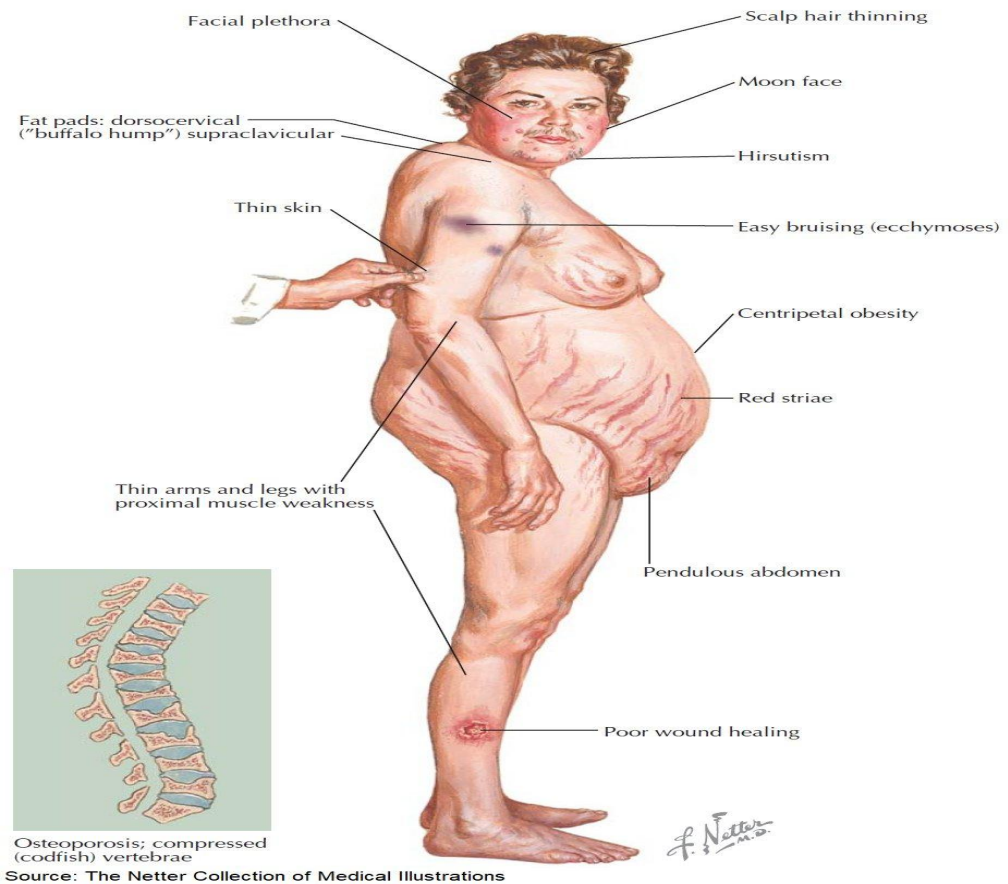


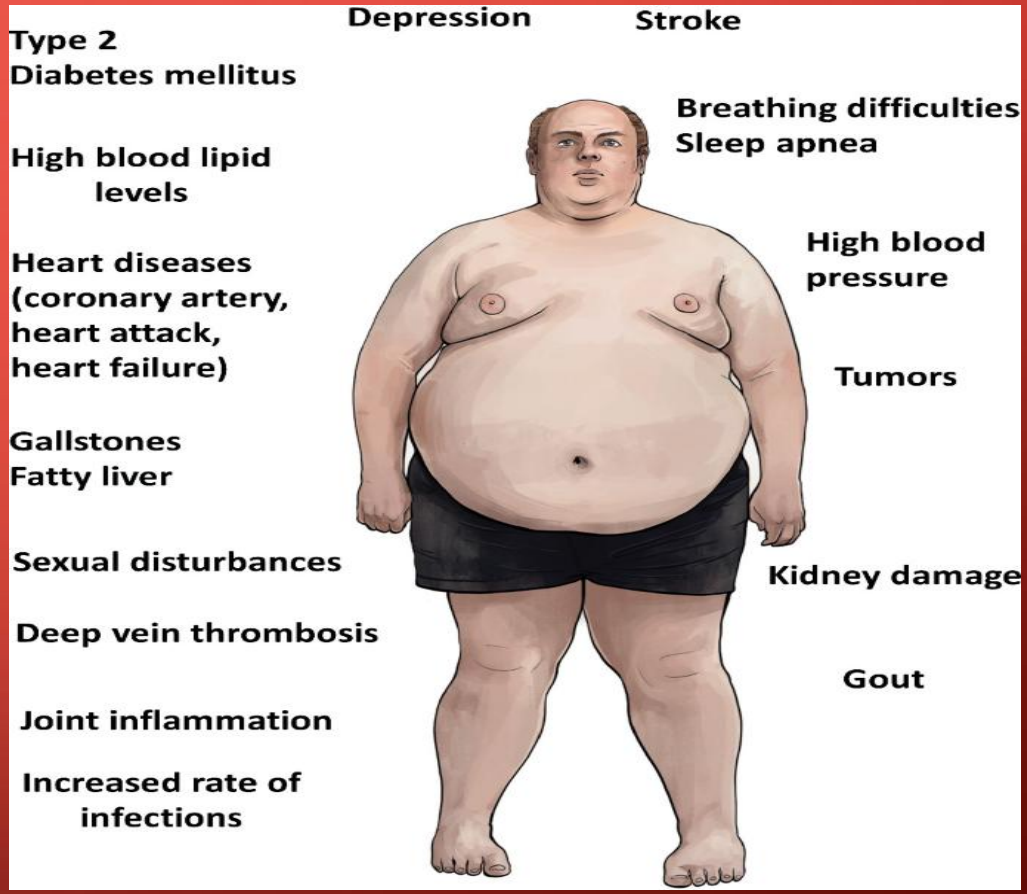


CUSHING'S DISEASE

- This disease occur due to excess pituitary gland production of adrenocorticotrophic hormone (ACTH) from the anterior pituitary adenoma .
- The signs & symptoms of the disease are :
- Weight gain in the trunk with thin arms & legs.
- Moon face .
- A fatty hump between the shoulders .
- Pink purple stretch lines on the lower abdomen , hips, highs, breasts.
- Thin frail skin that bruises easily .
- Slow wound healing .
- Acne
- Arterial hypertension, impaired glucose metabolism , dyslipidemias, myopathy, skeletal fractures, neuropsychiatric & cognitive impairment

FEATURES OF CUSHING'S DISEASE & SYNDROME





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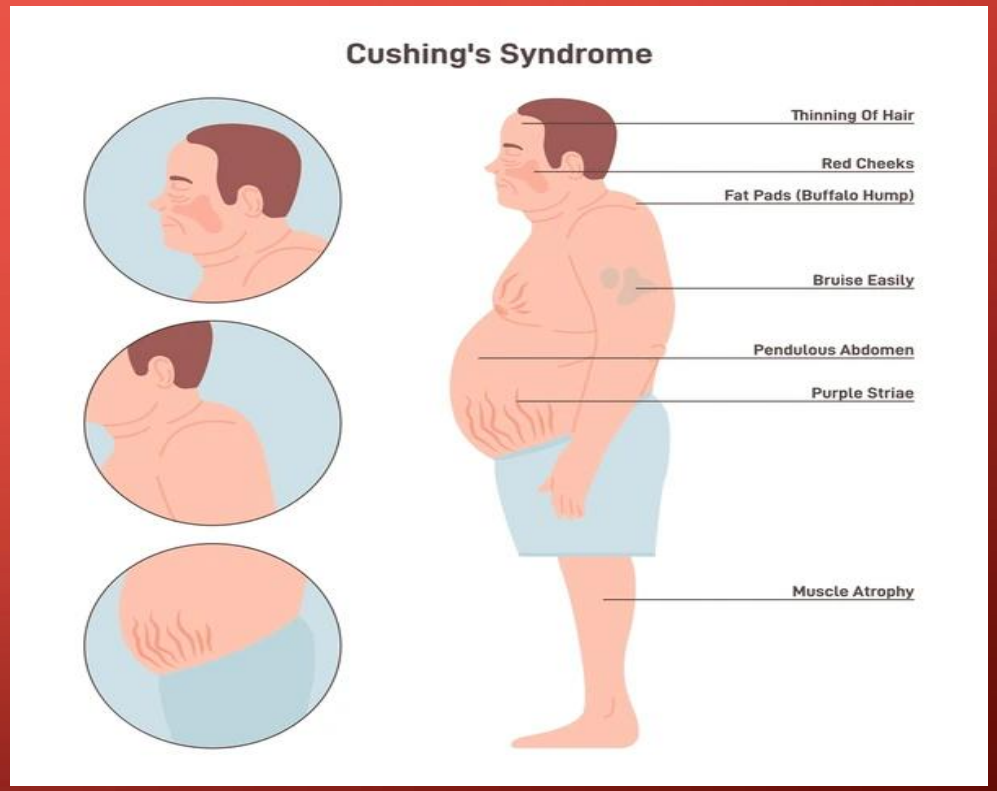

DIAGNOSIS OF HYPOTHALAMIC & PITUITARY DISEASES

- The same principle for diagnosis of endocrine diseases are applied here, i.e stimulation of secretion in deficiency & suppression for overproduction of specific hormones.
- Some hormone excess conditions , just simple hormone estimation will suffice , e.g. hyperprolactinemia.
- As the tests for endocrine diseases are expensive & time consuming , they should be carried out after full history & clinical examination is done. Some clinical presentations of endocrine diseases are non specific (headache, weakness, polyurea polydipsia, depression) , high index of suspicion is needed. The pituitary & hypothalamic disease are usually associated with neurological defects , so the assistance of a neurologist is important for complete evaluation of the patient (visual field defects , focal signs , increased intracranial pressure or focal signs).
- After confirmation of endocrine dysfunction, imaging studies are needed usually , CT or MRI . For deciding the best modality of treatment (surgical ,medical or radiotherapy).

TREATMENT

- Most hypothalamic & pituitary adenomas & tumors needed surgical removal , especially macroadenoma, or due to pressure effect on different pathways in the brain , or due to elevated intracranial pressure.
- In some cases surgical decision can not be applied , due to general health condition (elderly , metastatic tumors) , in these patients , medical treatment is advisable , by drugs or radiotherapy.
- Hormone level estimation is needed for follow up of these patients to detect early relapse & to confirm complete cure .