

Endocrinology revision

Enumerate :

1. Causes of Cushing syndrome.
2. Causes of secondary diabetes.
3. Causes of stunted growth.
4. Endocrinal causes of short stature.
5. Causes of hypercalcemia.
6. Identify the TWO most common causes of hypercalcemia
 - Primary hyperparathyroidism 55%
 - Malignancy 30%
7. Causes of hypocalcemia.
 - Chronic renal failure.
 - Vitamine D deficiency.
 - Hypoparathyroidism.
 - Hyperphosphatemia.
 - Acute pancreatitis.
8. Causes of fasting hypoglycemia
9. Causes of hirsutism.
10. Causes of gynaecomastia.
11. Causes of tetany.
12. Causes of hypoadrenalism.
13. Causes of hypothyroidism.

14. Causes of delayed puberty.

- 1) Anatomic abnormality in the genital tract.
- 2) Hypergonadotropic hypogonadism:
 - ✎ Gonadal dysgenesis (Turner's syndrome)
 - ✎ Ovarian or testicular failure.
- 3) Hypogonadotropic hypogonadism:
 - ✎ Isolated gonadotropic deficiency.
 - ✎ Idiopathic hypopituitarism.
 - ✎ Neoplasm of the hypothalamic pituitary axis
- 4) Chromosomal abnormality: Turner syndrome
- 5) Chronic disease:
 - ✎ Thalassemia major
 - ✎ Malabsorption syndrome
- 6) Idiopathic delayed puberty

* Text book of internal medicine, Cairo university school of medicine.

15. Causes of obesity.
16. Causes of loss of weight inspite of good appetite.
17. Causes of nephrogenic DI.
18. Causes of hyperprolactinemia.
19. Acquired causes of hyperlipidemia
 - Hypothyroidism
 - DM
 - Obesity/metabolic syndrome
 - Primary biliary cirrhosis
 - Nephrotic syndrome
 - Diet high in saturated fat
 - Drugs : anabolic steroids , beta blockers , thiazides ...
20. Criteria for good diabetic control. P86
21. Endocrinal causes of hypertension.

22. Laboratory tests for hyperthyroidism.
23. Side effect of metformin.
24. Endocrinal causes of abdominal pain.
25. Plain X-ray skull in a case of acromegaly.
 - Widening of sella turcica and erosion of posterior clinoids.
 - Widening of nasal sinuses.
 - Prominent supraorbital ridges & occipital protuberance.
 - Prognathism with wide separation of teeth.
26. Genetic syndromes associated with diabetes
 - Down's syndrome.
 - Turner's syndrome.
 - Friedreich's ataxia
 - Myotonia dystrophy.
27. Criteria for diagnosis of diabetes mellitus
 - Classic symptoms of hyperglycemia PLUS random glucose of > 200 mg/dL
 - Fasting plasma glucose of 126mg/dL or greater on TWO separate occasions.
 - 2 hours postprandial glucose of 200 mg/dL or greater confirm the presence of diabetes.
28. Define Impaired glucose tolerance :

Patients with levels between 140 and 199 mg/dL , 2h postprandial or random blood glucose.

29. Acute diabetic complications :
 - Hypoglycemia
 - DKA
 - HHNK state
 - Lactic acidosis.
30. Clinical stages of diabetic nephropathy
31. Skin complications of DM
32. Cardiovascular , neurological , urogenital complications of DM.
33. Endocrinopathies ,that may be associated with hyperglycemia.
 - Acromegaly
 - Cushing's syndrome
 - Pheochromocytoma
 - Thyrotoxicosis.
 - Somatostatinoma , glucagonoma.
34. Lab data associated with DKA
 - Plasma glucose > 250mg/dL
 - Arterial PH < 7.3
 - High anion gap
 - $\text{HCO}_3^- < 18 \text{ mEq/L}$
 - Positive serum & urine ketones.
 - Elevated serum potassium.

Give a short account on :

1. Management of DKA
2. Clinical picture & treatment of hypoglycemic coma.

3. Different types of insulin.
4. Indications , adverse effects of insulin.
5. Diabetic nephropathy.
6. Diabetic neuropathy
7. Microvascular complications of DM
 - Retinopathy - nephropathy - neuropathy
8. Oral hypoglycemic drugs
9. Management of type II diabetes (drug details needed)
10. Diagnosis , treatment of hyperthyroidism.
11. Diagnosis & treatment of hypothyroidism.
12. Thyroid emergencies
 - o Thyrotoxic crisis (thyroid storm)
 - o Myxedema coma
13. Clinical picture , investigations & treatment of primary hyperparathyroidism.
14. Management of Cushing's syndrome.
15. Causes , Clinical picture , Investigations & treatment of chronic adrenal failure.
16. Acute adrenal failure
17. Hazards of obesity.
18. Diagnosis , treatment of acromegaly

19. Pituitary apoplexy

- Def : sudden enlargement of the pituitary by hemorrhage into the tumor
- C/P :
 - Pressure manifestations : Headache , vomiting , visual defect .
 - Panhypopituitarism :
- Investigations :
 - Lab : evaluate pituitary hormones , electrolytes , glucose.
 - Imaging : CT , MRI (MRI is the most sensitive)
- TTT : Replacement therapy , Transsphenoidal surgical decompression of the tumor. See *panhypopituitarism*

20. Management of tetany.

21. DD of polyuria.

22. DD of short stature.

23. DD of hypercalcemia.

24. DD of skin pigmentation.

25. Multiple Endocrine Neoplasia {**MEN**}

MEM-I

- ✎ Hyperparathyroidism
- ✎ Pancreatic tumor
- ✎ Pituitary tumor

MEN-II**MEN-IIa**

- ✎ Medullary carcinoma of the thyroid
- ✎ Pheochromocytoma
- ✎ Hyperparathyroidism

MEN-IIb

- ✎ Medullary carcinoma of parathyroid 100%
- ✎ Pheochromocytoma 50%
- ✎ Muocosal neuroma 100%
- ✎ Marfinoid habitus 75%
- ✎ Ganglio-neuromatosis of the bowel 40%

26. Autoimmune polyglandular syndrome

Type I

- ✎ Mucocutaneous candidiasis
- ✎ Autoimmune hypoparathyroidism
- ✎ Adrenal failure

Type-II

More common than type –I

Female : male = 3:1

- ✎ Adrenal failure
- ✎ Autoimmune thyroid disease
- ✎ Type-I DM
- ✎ Others:
 - Primary hypogonadism
 - Myasthenia gravis
 - Pernicious anemia
 - Celiac disease
 - Alopecia
 - Vitiligo

Other new therapy for diabetes : ***Pramlintide :**

- Is synthetic amylin analogue.(amyline is a hormone secreted by beta cells of pancreas)
- Used in type 1 or insulin requiring type 2 DM.
- Given with current diabetic regimen.
- Mode of action : Pramlintide injected SC just before a meal slows gastric emptying & suppresses glucagon but doesn't alter insulin levels.
- S/E : nausea , vomiting , frequent dosing injection (3 times daily)

Oral hypoglycemic agents : ***1- Sulfonylureas :****2- Biguanides (Metformin)****3- Alpha glucosidase inhibitors : Acarbose (glucobay)**

- Prevent breakdown of CHO in intestine \Rightarrow \downarrow glucose absorption.
- Disadvantage : Contraindicated in hepatic patient , abdominal pain.

4- Glinides : Repaglinide , Nateglinide.

- Stimulate secretion of insulin from beta cells.
- Rapid onset & short duration , acts on post prandial hyperglycemia.

5- Thiazolidinediones : (Rosiglitazone)

- Increases insulin sensitivity
- Can be combined with sulfonylurea , metformin or insulin.
- Advantage : improve diabetic dyslipidemia.
- Disadvantage :
 - Contraindicated in mild liver impairment.
 - Given cautiously to patient with heart failure , renal impairment.
 - Weight gain , mild edema.

NB : all oral hypoglycemic drugs are given cautiously to patient with hepatic ,renal & heart failure.

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Endocrine doses**1- DM :**

- **Dose of insulin** : P 80

- **DKA** : P 75 don't forget the doses of the following :

i- Short acting insulin : 5 – 10 U / hour infusion

When blood glucose < 250 mg/dl : reduce insulin to 2 – 4 U / hour.

ii- Fluid therapy : 6 – 8 L is usually required.

At first saline is given , then change to glucose 5 % when blood glucose < 250 mg/dl.

iii- K therapy : add 20 – 40 m.eq to each 1 L of fluid.

2- SRG :

Caushing : Suppression test : by dexamethazone

- Small dose : 0.5 mg / 6h for 2 days
- Large dose : 2 mg / 6h for 2 days

Addison :

- Cortisone : 7.5 mg / d
- Flurocortisone : 0.1 – 0.2 mg/d

Addisonian crisis : Hydrocortisone : 50 mg / 6h

NB : Dexamethasone 2mg IV is indicated before or during ACTH test because it will not interfere with plasma cortisol assay.

3- Thyroid :

- **Antithyroid drugs :**

- Methyl thyouracil : **200** mg tds then reduce after 2 months to **100** mg tds for 2y
- Propyl thyouracil : **100** mg tds then reduce after 2 months to **50** mg tds for 2 y
- Carbimazole : **20** mg tds then reduce after 2 months to **10** mg tds for 2 years

Thyrotoxic crisis :

- ◇ Propyl thyouracil : 200 mg / 4 h orally , rectally or nasogastric.
- ◇ Propranolol : in full dose (1mg/ 5 min IV then 100 mg / 6h orally)

Hypothyroidism :

L thyroxin : start with 50 µg/d & gradually up to 100 – 200 µg /d orally

Myxedema coma : Thyroxine 250 µg IV

Cases

1- Male patient of 42 years old, presented with parasthesia in his hands & feet of 6 months duration. During this period he was admitted to the emergency hospital with disturbed level of consciousness and left sided body weakness. He was fully investigated and received medical treatment and discharged well after one week. He advised to be kept on special diet regimen and specific drug (injection) used daily. He gave history of palpitation & fainting attacks on standing. Clinical examination revealed cachexia, white patches over the tongue. Pulse 98b/m, BP standing 140/85 and recumbent 180/105 mmHg. Heart accentuated S2 with ejection systolic murmur over the mitral area, Liver was enlarged 2 fingers with rounded border but not tender. Neurological examination revealed superficial & deep sensory affection.

- a) What is the provisional diagnosis ?
- b) Give an explanation to symptoms & signs in this patient.
- c) If there are other complications to the primary disease ?
- d) What is the pathogenesis of these complications ?
- e) What are the investigations suggested for diagnosis ?

a) This is a case of DM complicated by stroke.

b)

- ✓ Peripheral neuropathy : parasthesia of hands & feet
- ✓ Autonomic neuropathy : fainting & postural hypotension & tachycardia.
- ✓ Monilial infection : white patches over the tongue.
- ✓ Accentuated S2 is due to hypertension
- ✓ Ejection systolic murmur is due to functional AS

c) complications of DM see endocrinology book

d) pathogenesis of DM & its complications

- ✓ Metabolic
- ✓ Recurrent infections.
- ✓ Vascular : micro & macro angiopathies
- ✓ Biochemical : accumulation of sorbitol ⇒ neuropathy.

e) Investigations : see endocrinology book

2- Female patient aged 32 years presented with backaches and fatigability with polyuria. She was overweight. BP 140/100 mmHg. Fasting blood glucose 200mg%

- a) Mention 4 signs that help the diagnosis.
- b) What is the possible diagnosis and differential diagnosis ?
- c) How would you treat such case ?

a)

- ✓ Plethoric face.
- ✓ Hirsutism and acne may be apparent in female
- ✓ Pigmentation & purpura.
- ✓ Trunkal obesity with stria rubra.
- ✓ Moon face : rounded face , bloated cheeks.
- ✓ Muscle wasting & weakness.

b)

Possible diagnosis : **Cushing's syndrome**

DD :

- ✓ Obese hypertensive diabetic patients.
- ✓ Female taking oral contraceptive pills.
- ✓ Chronic alcoholism.
- ✓ Frolich's syndrome : trunk obesity , hypogonadism , polyphagia.
- ✓ Differentiate between 1ry & 2ry Cushing. (.....)

c) Treatment of Cushing : see endocrinology book p 53

3- A 40-year-old man is seen because of headaches, muscle aches, and chronic low back and joint pain. As he enters the office, you notice his coarse facial features, frontal bossing, and large jaw. When you shake his hand, you find he has large, doughy, sweaty palms and, when he smiles, you note his teeth are widely spaced. He has not seen a physician in 10 years and is taking no medications. His back and joint pain have been worsening for 6 years, but his headaches started 6 months ago. His physical examination findings are significant for a BP of 150/100 mm Hg, pulse of 60 per minute, and respiratory rate of 12 per minute.

He returns in 2 weeks with old photographs that confirm a change in his physical appearance over time, and the laboratory test results confirm your clinical impression.

- a) What is your initial diagnosis in this patient?
- b) Besides the back and joint pain and the headaches, what other symptoms would you look for to confirm or refute your diagnosis?
- c) Besides the physical features you observe initially, what other abnormalities would you look for on physical examination?
- d) What laboratory tests should be performed initially?
- e) What additional testing should be performed once the initial laboratory results are known?
- f) What is the preferred treatment in this patient?

a) What is your initial diagnosis in this patient?

Acromegaly should be your initial diagnosis.

b) Besides the back and joint pain and the headaches, what other symptoms would you look for to confirm or refute your diagnosis?

Other symptoms to look for in this patient include a change in glove, ring, and shoe sizes, spaces between the teeth, decreased libido and impotence, sweating, new snoring, polyuria, polydipsia, and a change in vision.

c) Besides the physical features you observe initially, what other abnormalities would you look for on physical examination?

Other physical features to look for in this patient include thick coarse skin, enlarged extremities and organs, entrapment neuropathies, visual field abnormalities, and decreased body hair and testicular size. Old pictures would confirm the clinical suspicion.

d) What laboratory tests should be performed initially?

Initial laboratory tests in this patient would consist of the measurement of **IGF-1** (somatomedin C) and fasting GH levels. If the levels are elevated it would suggest the diagnosis of acromegaly, which would be confirmed if the GH levels did not suppress to less than 2 ng/mL in response to a glucose load (suppression test)

e) What additional testing should be performed once the initial laboratory results are known?

If the initial laboratory results indicate acromegaly, a fasting blood sugar test should be performed to rule out diabetes. Pituitary tests should include measurement of the prolactin, FSH, LH. An MRI scan can show the extent of the tumor, and formal visual field testing should be performed.

f) What is the preferred treatment in this patient?

The preferred initial treatment is surgical removal of the tumor. Bromocriptine or a somatostatin (octreotide) analog may be useful as medical adjuncts. Radiation therapy may be indicated for the destruction of residual tumor if reoperation or surgical cure is not feasible. Postoperative hormonal testing is indicated to reassess pituitary function. Echocardiography and colonoscopy should be performed to evaluate for cardiomegaly and colon polyps.

4- A known diabetic patient was brought to the hospital in coma.

- Enumerate the probable causes.
- How would you differentiate between the 2 most common causes of coma in diabetic patient aged 20 years ?

Answer : b) DKA & hypoglycemic coma : see endocrine book

5- A woman aged 55 years old, her weight is 95 kg & her height is 160 cm. She was discovered by chance to be diabetic.

- What are the laboratory criteria for diagnosis of DM?
- Discuss oral anti-diabetic drugs ?
- Describe one method by which you can know if she is obese.
- Enumerate the hazards of obesity.

The answer : Needless to say that she is **type 2 DM**

c)

Diagnosis of obesity :

1- Body Mass Index (BMI) :

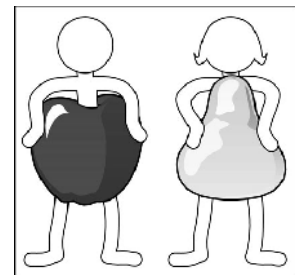
$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height}^2(\text{m}^2)}$$

BMI	Classification
18.5 – 25	normal weight
25 – 30	overweight
30 – 35	class I obesity
35 – 40	class II obesity
Over 40	class III obesity

2- Skin fold thickness e.g. over triceps (N : 20 mm in ♂ , 30 mm in ♀).

3- Estimation of body fat : (Waist / hip ratio)

- Central obesity : more fat in the upper body (*Apple shaped*) , associated with more morbidity .
- Peripheral obesity : more fat in lower body (*pear shaped*) , associated with less morbidity .



6- A male diabetic patient 30 years old who received his usual insulin therapy in the morning, but he neglected to take his breakfast, short time later he got blurring of vision, irritability, excessive sweating, then he passed into coma.

- a) What is the diagnosis ?
- b) How can you prove your diagnosis ?
- c) How can you treat this patient ?
- d) What are the possible other causes of such diagnosis ?

7- A 25 year old pregnant female developed severe post-partum hemorrhage which was successfully controlled. The baby was artificially fed as his mother's breast failed to secrete milk. The mother began to feel weak and she noticed atrophy of her breasts.

- a) What is the most probable diagnosis ?
- b) What is the expected BP of the patient ?
- c) How to prove your diagnosis by investigations ?

Three drugs were prescribed after the results of investigations were known, but the patient started only by one of them, in order not to distress her stomach. Next day the patient complained of severe abdominal colic, vomiting and diarrhea. Her BP was dropping rapidly and she became irritable and confused.

- d) What is your diagnosis ?
- e) How to manage the case ?

The answer :

- a) Sheehan syndrome.
- d) Acute adrenal failure.

MCQ

1- Insulin is contraindicated in :

- a) Type 1 DM
- b) Complicated type 2 DM
- c) DM with pregnancy.
- d) Hypoglycemic coma.

2- Hypoglycemia is characterized by all the following EXCEPT

- a) Blurring of vision.
- b) Headache.
- c) Dry skin
- d) Pupillary dilatation.

3- Gynaecomastia may be seen in all the following EXCEPT

- a) Newborn infants
- b) Klinefelter syndrome
- c) Hypopituitarism.
- d) Turner's syndrome

4- Secretion of which of the following hormones does not primarily occur at night

- a) Insulin
- b) Growth hormone
- c) Melatonin
- d) Prolactin

5- Earliest changes observed by ophthalmoscope in background retinopathy in diabetes

- a) Venous dilatation
- b) Microaneurysms
- c) Increased capillary permeability
- d) Arterio-venous shunts

6- Which is NOT a part of metabolic syndrome X

- a) Hyperlipidemia
- b) Obesity
- c) Ischemic heart disease
- d) Hypertension

7- Thiazolidinedione group of antidiabetic is

- a) Voglibose
- b) Nateglinide
- c) Rosiglitazone
- d) Glimepiride

8- All are features of diabetic ketoacidosis EXCEPT

- a) Hyperthermia
- b) Drowsiness
- c) Dehydration
- d) Air hunger

9- Commonest cause of coma in a diabetic is

- a) DKA
- b) Lactic acidosis
- c) Hyperosmolar hyperglycemic non ketotic coma
- d) Hypoglycemia

10- A patient of impaired fasting glucose ranges blood glucose value in between

- a) 96 - 106 mg/dL
- b) 106 - 116 mg/dL
- c) 100 - 125 mg/dL
- d) 116 - 130 mg/dL

11- Microalbuminuria is urinary albumin excretion ratio between

- a) 10 - 20 $\mu\text{g}/\text{min}$
- b) 20 - 200 $\mu\text{g}/\text{min}$
- c) 30 - 300 $\mu\text{g}/\text{min}$
- d) 40 - 400 $\mu\text{g}/\text{min}$

12- Myxedema coma is characterized by

- a) Hypertension
- b) Tachycardia
- c) Euthermia
- d) Hypoventilation

**13- Upper segment > lower segment of body is found in all (in dwarfism)
EXCEPT**

- a) Pituitary dwarf
- b) Cretinism
- c) Achondroplasia
- d) Juvenile myxedema

14- Which cranial nerve is not involved in acromegaly

- a) VIII
- b) III, IV, VI
- c) V
- d) II

15- Pseudo-Cushing's syndrome may be found in all EXCEPT

- a) Myxedema
- b) Chronic alcoholism
- c) Obesity
- d) Depression

16- Gynaecomastia may be produced after treatment with all EXCEPT

- a) Spironolactone
- b) Digitalis
- c) Cimetidine
- d) Rifampicin

17- Pheochromocytoma is not associated with

- a) Weight gain
- b) Fear of death
- c) Paroxysmal hypertension
- d) Constipation

18- Most common type of carcinoma of the thyroid gland is

- a) Follicular
- b) Anaplastic
- c) Papillary
- d) Mixed (follicular & papillary)

19- Froehlich's syndrome is characterized by all EXCEPT

- a) Infantilism
- b) Truncal obesity
- c) Diabetes mellitus
- d) Mental retardation

20 - Which is not a part of multiple endocrine neoplasia type 1

- a) Pheochromocytoma
- b) Tumor of pituitary
- c) Tumor of pancreas
- d) Hyperparathyroidism

21- Tertiary hyperparathyroidism is commonly found in

- a) Rickets
- b) Pseudohypoparathyroidism
- c) Chronic renal failure
- d) Malabsorption syndrome

22- Commonest cause of thyrotoxicosis is

- a) Multinodular goiter
- b) Hashimoto's thyroiditis
- c) Grave's disease
- d) Well differentiated carcinoma

23- Osmoreceptors are present in

- a) Atria
- b) Kidney
- c) Anterior hypothalamus
- d) Adrenal cortex

24- In Somogyi phenomenon commonly associated with type 2 DM, the dose of insulin should be

- a) Increased
- b) Stopped
- c) Decreased
- d) Needs no change

25- Orlistat is used to treat

- a) Diabetic nephropathy
- b) Gout
- c) Obesity
- d) Anorexia nervosa

The answers

- | | | | |
|-----|---|-----|---|
| 1) | D | 14) | C |
| 2) | C | 15) | A |
| 3) | D | 16) | D |
| 4) | A | 17) | A |
| 5) | B | 18) | D |
| 6) | C | 19) | C |
| 7) | C | 20) | A |
| 8) | A | 21) | C |
| 9) | D | 22) | C |
| 10) | C | 23) | C |
| 11) | B | 24) | C |
| 12) | D | 25) | C |
| 13) | A | | |

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