Endocrine

434 Physiology team
presents to you:

Hyper, Hypo Parathyroidism

- Important
- Further explanation

Contents

5:17 Min

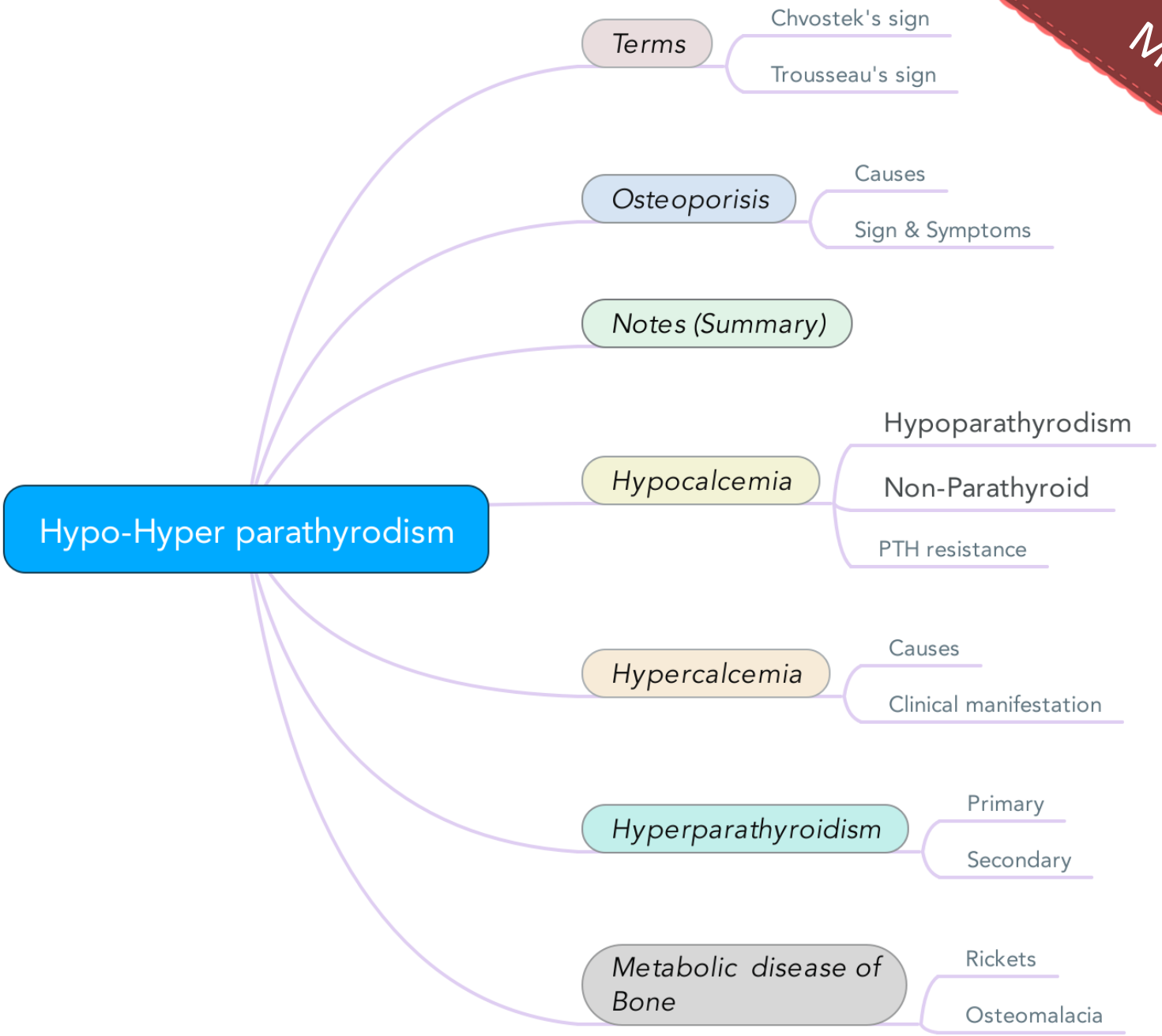
Parathyroid & hyperparathyroidism

20:22 Min

Hypo & Hyper-parathyroidiam

Please check out this link before viewing the file to know if there are any additions/changes or corrections. The same link will be used for all of our work Physiology Edit

Mindmap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Terms

Chvostek's sign

0:10 min

Tapping the facial nerve as it emerge from the parotid gland In front of the ear → Contraction of the facial muscles.

Trousseau's sign

0:44 min

Arresting blood flow to the forearm for few minutes → Flexion of the wrist, thumb and metacarpophalangeal joints.

Metabolic diseases of Bone

Rickets (in children)

❖ Cause :

Lack of Vit-D (which will increase Ca++ in blood) that will lead to Ca & phosphate deficiency. (Bow-legged) انعواج

Deficiency of renal 1a-hydroxylase (Vit-D resistance) :

sex link on X chromosome & the teeth could be hyperplastic & eruption.

❖ Features :

- Low Ca & phosphate.
- Weak bones. (effect bone salts)
- Tetany. (spountensly contraction)

❖ Treatment :

- Ca & phosphate supplement.
- Large amount of Vit-D.

Osteomalacia (in Adult)

❖ Serious deficiencies of Vit-D & Ca could be of steatorrhea.

❖ Rarely proceeds to tetany stage but often cause sever bone disability.

❖ Effect bone salts.

❑ Renal Rickets

It's caused of prolonged renal disease which will effect the enzyme 1a-hydroxylase (convert inactive form of Vit-D to active form).

Cont.... Metabolic disease of Bone

Stages of Rickets

There is no tetany.

PTH stimulate osteoclastic absorption which will increase Ca level in ECF and become normal

→

The bone become exhausted of Ca (mean absorption of Ca is prolonged)

Ca level fall down

→

Blood level of Ca is below 7 mg/dl (9-10.5 mg/dl)

Signs of tetany (Chvostek's & Trousseau)

Tetanic respiratory spasm.(larynx and bronchus contraction → Death)

Bone is composed of :-

bone salts (Ca) → which give compression force

organic matrix (collagen) → which give Tensile force

Osteoporosis

Osteoporosis

- It's the most common of all bone disease.
- It effect the bone salt & organic matrix.
- It's due excess osteoclastic activity

Sign & symptoms

- Compression fracture (most common asystematic)
- Hip fracture

Causes

- 1- lack of physical stress.
- 2-Malnurtient .
- 3- lack of vitamin C
- 4- postmenopausal (lack of estrogen) why? Because estrogen is one of the factors that stimulate calcitonin

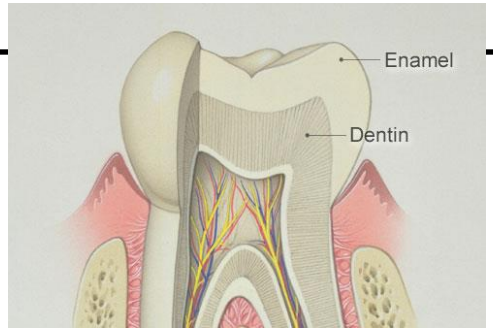
  calcitonin lower Ca in bloodstream. By deposition of Ca in bones.
- 5- old age.
- 6- Cushing's syndrome

Hypocalcemia

Hypoparathyroidism (rare)	No parathyroid	PTH resistance
➢ Malignant tumor . ➢ Idiopathic. ➢ Autoimmune	➢ Vit-D deficiency (Rickets). ➢ Malabsorption. ➢ Liver & Kidney disease. ➢ Vit-D resistance.	❖ Pseudohypoparathyroidism: ➢ Increase production of calcitonin (tumor in thyroid)

- ❖ Tingling of lips.
- ❖ Dry hair.
- ❖ Muscle cramps & pain.
- ❖ Cataract on eyes.
- ❖ Loss of memory.
- ❖ Seizure.
- ❖ Tetany :
  - Chvostek's sign.
  - Trousseau's sign .

- ❑ Pseudohypoparathyroidism:
- ❖ Have normal PT gland, but they fail to respond to PTH.
  - Symptoms begin at 8 years old
  - Tetany .
  - Hypoplasia dentin or enamel.
  - Absence of eruption 50% .ترتيب
  - Short stature.
  - Hypocalcemia & hypophosphatemia
- ❖ Autosomal disease.
- ❖ Treatment by supplement of Ca & Vit-D



Hypercalcemia

Common	Uncommon
Malignant disease	Renal failure
Hyperparathyroidism	Sarcoidosis
Vit-D excess intake	Multiple myeloma

- **How can malignant tumors cause hypercalcemia ?**
  - By increase PTHrP which will increase PTH.
- **What is PTHrP?** Parathyroid hormone related peptide
  - it's found in breast (lactation) & in placenta (pregnancy) & and there is some adenoma or malignancy that increase PTHrP .

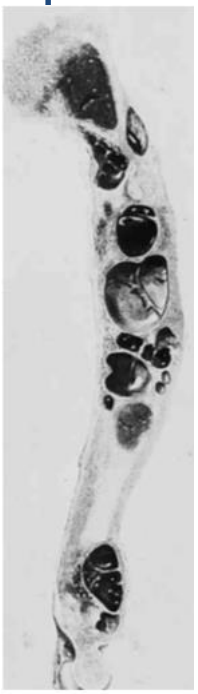
❑ **Clinical manifestation :**

- ❖ Renal → Nephrocalcinosis , Nephrolithiasis , Dehydration , Nephrogenic diabetes insipidus
- ❖ Bone → Pain , Athrgleia , Osteoporosis , Ostitis fibrous cytica (in primary hyperparathyroidism)
- ❖ GIT → Nausea, Vomiting , Weight loss , Abdominal pain , Pancreatitis , Peptic ulcer.
- ❖ Psychic → Impaired memory & Concentration , Coma , Confusion , Fatigue & Lethargy .
- ❖ Neuromuscular → Easily fatigue , Reduce excitability .
- ❖ CVS → Shortening of QT interval , Cardiac arrhythmias , Vascular calcification (stenosis).
- ❖ Others → Itching , Conjunctivitis , Carpal tunnel syndrome , Corneal calcification.

Hyperparathyroidism

Primary

- Hyper- calcemia
- Hypo- phosphatemia
- Hyper- calciuria
- Multiple bone cysts (osteitis fibrosa cystic)
- Broken bone because of osteoclastic activity.
- Alkaline phosphatase.



Secondary

- **Due Ca^{++} decrease in ECF**
- **Causes:**
  - Low calcium diet
  - Pregnancy
  - Lactation
  - Rickets
  - Osteomalcia
  - Chronic renal failure

Some Notes

Summary

- The most serous complication in hypocalcemia (hypoparathyrodim) is contraction of bronchus &larynx → could lead to Death.
- Ca^{++} → High (ECF) lead to depression of nerves.
  → low (ECF) lead to hypersensitivity (lower the threshold)
- How to understand it → the job of Ca^{++} is attached to Na channel which will lower Na influx so when the Ca^{++} is low the Na will influx easily cause hypersensitivity.

Hyperfunction	Hypofunction
Hyper- calciemia	Hypo- calciemia
Hypo- phosphatemia	Hyper- phosphatemia
Hyper- phosphaturia	Hypo- phosphaturia
Osteoporosis	Tetanus
Accumulation of Ca in tissues	

Answer key: 1:C, 2:D, 3:C, 4:C, 5:D

MCQs

1-All of the following are the manifestation of hypocalcemic tetany except:

A.Adduction of the thumb
B.Flextion at metacarpophalangeal joint
C.Flextion at interphalangeal joint
D.Flextion at wrist

2-regarding hypoparathyroidism choose the incorrect statement :

A.lead to hyper reflixa
B.can by triggered by Chovestk's sign
C.lead to low threshold
D.lead to renal stones

3-all of the following lead to Osteoporosis Except:

A- Ageing
B- Long Ca deficiency
C- Increase Estrogen
D- immobilization of bone
E- weight less ness

4-one of the following is a hypocalcaemia symptom:

A- hypo reflixa
B- increase threshold
C- hyper reflixa
D- cardiac arrhythmia
E- renal stones

5-One of the features of Rickets:

A.Low Ca & phosphate.
B.Weak bones. (effect bone salts)
C.Tetany. (spountensly contraction)
D.All of the Above:

SAQs

Q1: What is the Chvostek's sign?

Ans: Tapping the facial nerve as it emerge from the parotid gland
In front of the ear → Contraction of the facial muscles.

Q2: What are the Effects of Hypercalcemia on CVS?

Ans: Shortening of QT interval , Cardiac arrhythmias , Vascular calcification (stenosis).

Q3: What are the causes of osteoporosis?

Ans:
1- lack of physical stress. 2-Malnurtient .3- lack of vitamin C
4- postmenopausal 5- old age. 6- Cushing's syndrome

Q4: What are the common diseases that cause hypercalcemia?

Ans:
Malignant disease
Hyperparathyroidism
Vit-D excess intake

Thanks for checking our work

Good Luck

Done by:

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MCQs and SAQs:

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