

Pathophysiology lab questions

Calcium-phosphate questions

1. A 56-year-old woman complains of fatigue. According to her medical records, she has hypertension, peptic ulcer and nephrolithiasis. Laboratory findings:

serum Ca: 2.8 mmol/l

serum phosphate: 0.6 mmol/l

serum ALP: 450 U/l

DEXA scan: T-score of -2.8 SD on the hip and forearm.

What test(s) would you order to determine the exact cause of her disease?

2. A 68-year-old nonsmoking man has been complaining of progressive weakness for 2 weeks. In addition to these symptoms he has developed intermittent cough, pleuritic chest pain and exertional dyspnea for 6 days. In the last weeks he frequently experienced nausea and vomited several times. Medical history reveals no hypertension or coronary artery disease. He has a long history of heartburn – he takes regularly antacids and drinks 1–2 l milk a day. Laboratory findings:

serum Ca: 2.8 mmol/l

serum phosphate: 1.8 mmol/l

BUN: 24 mmol/l

HCO₃⁻: 38 mmol/l

PTH and vitamin D: normal.

What is the most likely diagnosis?

3. A 35-year-old woman is complaining about frequent muscle cramps. She was admitted to the hospital after having a convulsion. She had thyroidectomy 3 months ago and she is on thyroid hormone substitution since then. Physical examination revealed a positive Chvostek's sign and Trousseau's phenomenon. Laboratory findings:

serum Ca: 1 mmol/l

serum phosphate: 2.0 mmol/l

serum ALP 140 U/l

What is your diagnosis? What further test(s) would you order to support your diagnosis?

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4. A 66-year-old woman felt a sharp, sudden lumbar pain as she was lifting a bag of groceries out of the supermarket cart. An X-ray taken in the emergency department showed a compression fracture of L1 vertebra. Laboratory findings:

serum Ca: 2.4 mmol/l

serum phosphate: 1.1 mmol/l

What is your diagnosis? What further tests would you order?

5. A 60-year-old diabetic woman has been on hemodialysis for 15 years. She recently started to complain of cardiac pain. She has no history of cardiac illness. Physical examination reveals pale, grey-yellow colored skin, but nothing else remarkable.

Exercise electrocardiogram shows ST-T alterations. Laboratory findings:

ALAT: 45 U/l

ASAT: 52 U/l

ALP: 120 U/l

serum creatinine: 180 μ mol/l

serum Ca: 2.1 mmol/l

serum phosphate: 2.8 mmol/l

serum PTH: elevated

What is the possible diagnosis?? What further tests would you perform?

6. A 65-year-old man complains of frequent urination and urinary retention. There is no macroscopic hematuria, urination is not painful. He complains of recurrent abdominal pain in the last weeks. Laboratory findings:

serum Ca: 3.5 mmol/l

serum phosphate: 2 mmol/l

BUN: normal

What is the possible diagnosis? What further tests would you perform to support your diagnosis?