mMEDCON International

Round 2 MPSC: OCCUPATIONAL MEDICINE (35 points)

Case study I: *(15p)*

History:

Male, 68 years old, former construction worker, worked for over 30 years in the construction industry, mainly renovating old buildings. In recent years, he began to experience worsening cough, shortness of breath and general fatigue, but did not pay much attention to these symptoms, attributing them to ageing and work fatigue. There was no family history of serious lung disease. The patient was a smoker, smoking approximately 15 cigarettes a day since his 20s, he had stopped smoking 10 years ago. The patient complains of increased shortness of breath when walking uphill or with physical exertion, even with daily activities such as climbing stairs.

Physical examination:

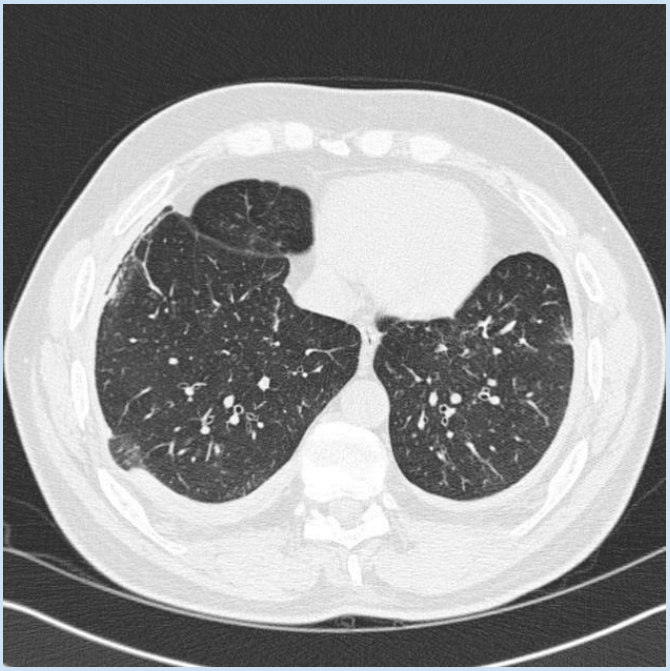
The patient's skin is pale with a slight cyanotic tinge on the lips.

On auscultatory examination, audible thickened breathing in the lower parts of the lungs and inspiratory crepitus. Dyspnoea present

Laboratory tests and imaging:

Chest X-ray: shows irregular "plaque-like" shadowing on the basal pleura of the lung and interstitial changes

CT scan of the chest: presence of diffuse pleural fibrosis, pleural thickening and a focus of round atelectasis in the posterior basal segment of the right lung



Spirometry: reduction in total lung capacity (TLC) and FVC associated with restrictive lung disease

Blood test:

C-reactive protein(CRP): 18 mg/l

Erythrocyte sedimentation (FW): 30 mm/h

Leukocytes: 8.5 x 10^9/l

Haematocrit (HCT): 0.48

Haemoglobin (Hb): 170 g/l

Arterial blood gas (ABG):

- pO_2: 8.5 kPa
- pCO_2: 5.8 kPa
- pH: 7.42

Creatinine: 90 µmol/l

Liver tests:

- AST: 0.47 µkat/l
- ALT: 0.50 µkat/l
- ALP: 1,17 µkat/l

Questions

1. What is the probable diagnosis and its pathophysiology ? *(5p)*
2. What are the main risk factors that may have contributed to the development of the disease in this patient ? *(2p)*
3. What further tests could we do for further confirmation of diagnosis and what findings would we expect? *(2p)*
4. What are the potential complications of the disease that should be considered in the long-term care of the patient? *(3p)*
5. What tests will be used to monitor further disease progression? *(2p)*
6. What occupational precautions could minimize the risk of developing the disease? *(1p)*

Case study II. *(10p)*

History:

The patient, a 45-year-old man, works as a farmer on the family farm where he regularly uses pesticides and insecticides. While applying insecticide spray in a closed room (greenhouse), after about 30 minutes of work, he began to experience dizziness, nausea, blurred vision, and shortness of breath. His symptoms gradually worsened and his colleagues preferred to bring him to the emergency room.

Physical examination:

On examination in the emergency department, the patient was pale, disoriented, hyperhydrotic and shallow tachypnea(28/min) was present. There were signs of cold sweats on the skin. Permanent miosis and hyperlacrimation present, photoreaction bilaterally presented poorly. There was a marked increase in airway mucus secretion and hypersalivation. On auscultation of the lungs, there were tender rales and wheezing. Blood pressure was 90/60 mmHg and heart rate 48bpm.

Laboratory and toxicological examinations:

Serum cholinesterase (butyrylcholinesterase): 28.39 µkat/l

Arterial blood gas (ABG):

- pO_2: 9.0 kPa
- pCO_2: 6.8 kPa
- pH: 7.32

Hematological and biochemical findings:

Leukocytes: 11.2 x 10^9/l

Creatinine: 95 µmol/l

AST: 0.57 µkat/l

ALT: 0.47 µkat/l

Questions:

1. What is the diagnosis ? *(2p)*
2. What is the pathophysiology of the diagnosis and why does it cause such symptoms ? *(3p)*
3. What will be the treatment and what is its pharmacological principle ? *(2p)*
4. What specific type of substances could have caused this condition and in which other occupation might you have encountered this condition? *(2p)*
5. What other measures would you recommend to protect workers to prevent such accidents ? *(1p)*

Case study III. (10b)

History:

The patient, a 52-year-old man, has been working as an auto mechanic and welder in a small workshop for more than 25 years. During his career, he has frequently come into contact with old lead batteries, paints and sometimes lead-containing solder. The patient admits that he did not use protective equipment, such as gloves or a mask, when working for a long time. In

recent months he has been feeling increasingly tired, complaining of abdominal pain, hair loss, frequent headaches, muscle aches and impaired concentration. Colleagues have also noticed that he is more irritable and moody.

Physical examination:

On physical examination, the patient appears pale and exhausted. His skin is pale, dry, and we observe signs of chronic dehydration. A fine grey-blue streak (Burton's line) is observed on the gums. Breathing is auscultatory clear and without pathological phenomena. Blood pressure was slightly elevated (145/90 mmHg). Palpation of the abdomen revealed mild tenderness in the epigastric region.

Hematological and biochemical findings :

- Haemoglobin: 110 g/l
- MCV (mean corpuscular volume): 75 fl
- Basophilic erythrocyte speckles: present
- Creatinine: 130 µmol/l
- Urea: 8.0 mmol/l
- AST: 0.60 µkat/l
- ALT: 0,53 µkat/l

Neurological examination:

Mild neuropathy present with hyporeflexia and hypesthesia in the upper limbs.

Questions:

1. What is the diagnosis and what caused it? *(2p)*
2. What is the pathophysiology and what are the long-term consequences of this condition? *(3p)*
3. What will the treatment be and what is its principle? *(2p)*
4. What is the prognosis for this condition? *(2p)*
5. What precautions should be put in place to protect workers? *(1p)*