Acute Phase Response, Fever, Hyperthermia.

Case 1.

Patient B., 47 years old, after an operation for a thyroid gland tumor removal developed symptoms of hypothyroidism (thyroid gland insufficiency). She was prescribed thyroxin. Her condition improved, and she increased the dose of the medication without consulting her doctor. Some time later, she began to complain of insomnia and palpitations, her body temperature increased to 37.5 – 37.7˚C.

1. Can we regard the body temperature increase in this patient as a fever?
2. How can we explain an increase in body temperature in excessive intake of thyroxin?
3. Is it advisable to administer aspirin to this patient? Why?
4. What is the difference between fever and hyperthermia?

Case 2.

Natasha K., 6 years old, was admitted to hospital with a diagnosis "infectious inflammation of the parotid glands (mumps)". The disease began with general malaise and gradual increase in the body temperature which reached 39˚C. The high temperature persisted for ten days. The difference between the temperature in the morning and in the evening did not exceed 1˚C. The patient developed weakness, drowsiness and poor appetite. 10 days later the temperature began to decrease gradually which was accompanied by intensive sweating.

1. What typical pathological processes were observed in this patient?
2. Explain their interrelation.
3. What type of temperature curve was found in this patient?
4. What degree of temperature rise was observed in this patient?
5. Explain the mechanism of the development of weakness, drowsiness and poor appetite.

Case 3.

Patient K., 18 years old, is admitted to an internal disease department with croupous pneumonia. His temperature is 40.5˚C, he is pale, the skin is dry. The tongue is white and coated. The patient complains of headache, complete loss of appetite, drowsiness, severe cough with sputum, dyspnea, soreness of muscles and joints. His blood pressure is 130/90 mm Hg, pulse - 98/min. The heart boundaries are normal, heart sounds are muffled. The breathing is rapid and shallow. Crepitation is heard in the lower part of the left lung. The liver is slightly enlarged.
Blood test: leukocytes – 18 x 10^9/l, neutrophil leukocytosis; erythrocyte sedimentation rate (ESR) – 22 mm/h. Blood sugar is 7mmol/l, albumin/globulin (A/G) coefficient is decreased.

1. Make a pathogenetic chain characterizing the mechanism of temperature rise in this patient.
2. What degree of temperature rise is observed in this patient?

3. Explain the connection between the inflammatory process in the lungs and general reactions of the organism.
4. What inflammatory phenomenon can crepitation be associated with?
5. Explain the mechanism of tachycardia, neutrophilia, hyperglycemia and a decrease in A/G coefficient.

Case 4.

Physical examination of the patient revealed a temperature increase to 37.8 ˚C. She has a history of persistent subfebrile temperature over the last year. Taking antipyretic medications (such as aspirin) does not lead to temperature normalization.

1. What pathological process (fever or hyperthermia) takes place in this case?
2. What causes can lead to this process?
3. What additional data should be obtained to make an accurate diagnosis?
4. Name the endogenous pyrogens (3) and list their main properties.
5. Give a brief characteristic of the stages of hyperthermia.

Case 5.

A child of 8 months of age was taken to hospital with a confirmed diagnosis of an infectious disease. Physical examination revealed a temperature rise up to 39.7˚C.

1. Explain the pathogenesis of the child's temperature rise.
2. What complications associated with high temperature can develop in this case?
3. Is it advisable to use methods of physical cooling in such cases? Why?
4. What is the difference between fever and hyperthermia?
5. What changes in the protein composition of blood plasma will be observed in this child?

Case 6.

Two patients were delivered to the admitting office of a hospital with acute pain in the ileac area of the abdomen. Their blood tests were made with diagnostic purposes.

Patient A.: no deviations from the norm were found in the patient's blood. The body temperature was 36.8 ˚C. After administration of spasmolytics the pain disappeared and the patient went home.

Patient B.: neutrophil leukocytosis with the left shift and an increased erythrocyte sedimentation rate (ESR) were detected, body temperature was 38.2 ˚C. The patient was taken to the operating block for further evaluation and possible surgical intervention.

1. What pathological processes did patients A. and B. most likely have?
2. What is a possible pathogenesis of pain syndromes in patients A. and B.?
3. Explain the mechanism of leukocytosis and ESR increase in patient B.
4. Explain the mechanism of body temperature rise.

Case 7.

A patient was admitted into the surgical department of hospital, with the diagnosis acute abdomen (abdominal pain). Based on the local symptoms like high temperature and neutrophilic leukocytosis, this confirms the diagnosis of acute appendicitis. The patient was sent to the operation room. As a result of appendectomy, the appendix was removed, which was then developed into purulent inflammation.

1. What is the mechanism of formation of purulent exudate?

2. How does purulent exudate fundamentally differ from serous exudate?

3. What complications can arise during the formation of purulent focus in the tissue?