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*Cardiopulmonary manifestations
of subarachnoid hemorrhage – a case report*

A 48-year-old female was admitted to the 1st Department of Internal Diseases in poor general condition, unconscious and with a pulmonary oedema. She did not respond to pain stimulation, but earlier, during transportation, she received narcotic analgesics. Her blood pressure was 140/120 mmHg. Heart rate was regular, 100/min, and peripheral blood pulse consistent with heart rate. Pupils were narrow, without reaction to the light. Paresis was not observed and Babiński sign was negative.

In laboratory tests the glucose level was elevated to 214 mg% and levels of kalium, natrium, urea and creatinine in serum were within normal ranges. Transaminases activity was also unaffected. In gasometric examination pH was reduced to 7.33 and pressure of carbon dioxide was at the lower normal range (35.7 mmHg). Pressure of oxygen in blood was reduced (48.8 mmHg) and base deficit was observed (–6.5 mmol/l).

In ECG recording sinus rhythm was observed; it was accelerated to 100/min, the electrical axis of the heart was deviated and the heart was in a semihorizontal position. In electrocardiographic lead I, aVL, v5-v6 horizontal elevation of ST segment was observed, which could suggest the possibility of myocardial necrosis in the lateral wall. In the treatment furosemidum was applied as well as intravenous infusion of nitro-glycerine, piracetam, nicergoline, K vitamin, cyclonamine, relanium, droperidol and dexamethasone. The patient was intubated and was left to breathe spontaneously. Blood pressure was reduced, and auscultatory signs of pulmonary oedema disappeared. Limb episodes of spasms appeared together with compulsory eyeballs positioning. Computed tomography of the head was performed, which revealed signs of subarachnoid bleeding – noticeable amount of blood could be seen in the cisterns of skull base, especially on the left side. Afterwards the patient was referred to Neurology Department where her general status slowly improved. In the angiographic examination of brain vessels two aneurysms, placed symmetrically on both internal carotid arteries, were discovered. Aneurysm on the left side was gigantic (diameter >2.5 cm).

The patient was then admitted in good general condition to the Neurosurgical Department after 3 weeks from the onset of illness: Except for positive Babiński sign on the left side no neurological deficits were observed. The patient was operated on twice, in accordance with computed tomography findings. First, fronto-temporo-sphenoidal craniotomy was performed on the left side in order to clip the neck of a giant left internal carotid artery aneurysm, the one that bled. After 11 days the second

aneurysm on the right side was clipped. After the first operation the patient developed a transient paresis of the ipsilateral oculomotor nerve. She stays under the supervision of neurosurgical outpatient clinic, suffers from cephalaea, memory disorders and slight paresis of 3rd cranial nerve.

Cardiological disturbances in ECG can be observed frequently in different neurological disorders – in intracranial haematomas, epilepsy, stroke and brain tumours. These disturbances may dominate clinical symptoms in patients and delay proper diagnosis of subarachnoid haemorrhage and appropriate treatment.

Disturbances in ECG record in patients with subarachnoid haemorrhage were described for the first time in 1947, but their reason is not clear enough even now. It is estimated that from 2% to 91% of patients with former aneurysmal bleeding have abnormal ECG (1, 4, 5). The most frequent finding is inversed T wave, lowered or elevated ST interval, elongation of QT interval and appearance of U wave (3, 4). In 4 – 7% of patients atrial fibrillation occurs. Other disturbances include ventricular tachycardia, atrioventricular block, ventricular fibrillation, atrial and ventricular extrasystole, tachycardia type torsade de pointes (1, 4, 5). Most of changes can be observed during first 48 hours from aneurysmal bleeding. Usually changes described above are mild and transient, but sometimes severe dysrhythmia can lead to sudden death. Cardiac disorders appear in approximately 1-4% of patients after subarachnoid haemorrhage caused by aneurysmal bleeding (1, 3, 4, 5). Cases are described, where altered ECG record stays unchanged for many weeks after the bleeding. (3). Dysrhythmias and disorders of heart contraction in ECG record more often apply to patients in severe neurological condition. Some assume that patients after subarachnoid haemorrhage are especially vulnerable to cardiological disturbances in future (3). Cardiac performance disorders are more frequently described in women, and the reason of it is unknown (5).

Changes in ECG in patients with subarachnoid haemorrhage often reveal as symptoms of myocardial ischaemia or symptoms of cardiac infarction (3, 5). In 30-50% of patients with subarachnoid haemorrhage an elevated level of creatinine kinase is observed (5), which can suggest the presence of acute myocardial necrosis and create additional diagnostic difficulties. Changes in ECG may be the source of great diagnostic problems in unconscious patients and in those with atypical clinical signs. The necessity of constant cardiological monitoring should be underlined, especially during first days after subarachnoid haemorrhage. Myocardial dysfunction described as neurogenic cardiac damage, is reversible in patients who survived an acute phase of subarachnoid haemorrhage. It can also evoke haemodynamic heart failure and lead to neurogenic pulmonary oedema (5). Cardiological disorders in SAH result from disequilibrium in autonomous nervous system and elevation of blood catecholamines. During sudden increase in intracranial blood pressure, which can be seen in case of subarachnoid haemorrhage, overstimulation of sympathetic nervous system occurs (2). In some patients after subarachnoid bleeding symptoms of structural heart damage can be seen. The most frequently described pathology in autopsy and experimental models of SAH is the marginal necrosis of myocardium (2, 4, 5). It is also underlined that hypocaliemia often accompanies severe dysrhythmias, also during SAH. Therefore, it is very important to define the level of kalium in blood serum and supplement its deficiency. It was proved, that not only the quantity of extravasated blood in CT examination but also lowering of cardiac volume are independent factors predisposing to brain vasospasm after SAH. In many clinical experiments relation between cardiological disturbances and the location of intracranial bleeding aneurysm was not, however, revealed (1).

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SUMMARY

The study presents a case of a 48-year-old female patient, in whom first symptoms of subarachnoid hemorrhage were suggestive of acute pulmonary oedema, caused by acute left ventricular insufficiency, evoked by myocardial infarction. The authors discuss the course of illness, diagnostic difficulties and changes in circulatory system, which can appear as a result of subarachnoid hemorrhage.

Objawy sercowo-płucne krwawienia podpajęczynówkowego – opis przypadku

Praca przedstawia przypadek 48-letniej chorej, u której początkowe objawy krwawienia podpajęczynówkowego sugerowały rozpoznanie ostrego pęcherzykowego obrzęku płuc w wyniku ostrej niewydolności lewej komory serca, spowodowanej świeżym zawałem mięśnia serca. Autorzy omawiają przebieg choroby u tej chorej, trudności diagnostyczne oraz zmiany układu krążenia, które mogą wystąpić w następstwie krwawienia podpajęczynówkowego.

