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Problems in Diagnosing Convulsive Attacks in Hypoparathyroidism

Trudności diagnostyczne napadów drgawkowych w niedoczynności tarczycy

Calcium is the essential factor conditioning irritability of neurons and contractility of muscle fibres. Calcium content in the human body equals 1.5% of dry mas and is almost entirely found in the extracellular space. Concentration of Ca ions in the extracellular space is almost ten thousand times larger than inside the cell. The difference results from the cell membrane's passive impermeability to these ions and the presence of membrane mechanisms which transport Ca ions into the extracellular space. The process of transporting Ca into the intracellular space is completed through calcium ducts which can be either active or blocked. Inside the cell Ca ions are found in composites together with calmodulin protein and so they exert an impact on many enzymatic reactions, Ca content increase inside the cell leads to the cell activity increase.

In the blood Ca is protein bound and ionized, its concentration in the blood depends on absorption in the digestive sytem, excretion with urine and degree of accumulation or mobilization in the bones.

Parathormone, calcitonin and vitamin D are essential for maintaining Ca balance in the body. Hypoparathyroidism leads either to parathormone deficiency or its insufficient functioning which finally results in hypocalcemia and hyperphosphatemia. Low concentration of ionized Ca in the blood leads to an excessive neuromascular irritability manifested by tetany (2).

The central nervous system and the hypothalamus area, locus ruber and structures of the brain stem in particular, seem to have an impact on tetany symptoms formation (3).

The most common tetany symptoms are paroxysmal myospasmus of either some or all the muscles, characteristic hand position: "obstetrician's hand", spasm of facial muscles which are accompanied by myailgis. The symptoms become worse because of respiratory alkalosis resulting from hyperventilation often accompanying tetany attack. Sometimes a tetany attack may resemble an epileptic attack which may result in misdiagnosis epilepsy. Administration of anticonvulsants may cause vitamin D deficiency which may intensify frequency of tetany attacks (1, 2).

CASE REPORT

A patient E. P., 17, pupil, received an outpatient treatment for three weeks prior to admission and was administered antiepileptics because of three convulsive attacks that occurred in him. Radiological examination of the cranial

bones revealed no abnormalities. On EEG general paroxysms of high voltage theta waves were marked with no changes in lateralization. The patient was admitted to Neurology Clinic because of persistent headaches, limited consciousness, apathy and complaints of spinal pains. Neurological examination revealed marked meningeal symptoms with no other symptoms of focal lesions of CNS present. Laboratory examinations showed no abnormalities. Since subarachnoid bleeding was suspected diagnostic lumbar puncture was performed and transparent fluid correct composition was obtained. In order to complete the diagnostic procedure panarteriographic examination of the brain vessels was performed under anaesthesia and it revealed no direct or indirect symptoms of vascular intracranial anomalies. On vascular examination and immediately after it general convulsive attacks occurred, the patient was unconscious, intubated, breathed with the help of assistor. Convulsive attacks were stamped out after Rivotril administration. Because of the nature of the convulsions Ca concentration in the blood was determined and marked hypocalcemia was reported: 1.7 mEg/l (standard 4.5—5.5 mEg/l). 10% Calcium "Polfa" was administered in a drip and the patient was on a proper diet. In the next days the patient's general condition improved, consciousness was regained, he was able to breathe by himself but was apathic and reluctant to contact environment. Neurological examination revealed a slight right-lateral hemiparesis. No convulsions were observed, the Chvostek's symptom was still present as well as the positive Trousseau test. Despite everyday application of Ca preparations, its concentration higher than 2.5 mEg/l and that of phosphorus lower than 8 mEg/l were not achieved. The Sulkowicz test was correct and Ca concentration in the urine was equal to 2.1 mEg/l and P concentration was equal to 16.6 mEg/l. CT scanning of the brain revealed no pathologies. In the presence of some difficulties with regaining calcium-phosphatase balance hydrochlorothiazid and vitamin D_3 (300,000 units) were administered for three days (then 50,000 units) which led to normalizing Ca and P concentrations in the blood and allowed to give up intravenous administration of Ca preparations within two weeks. Parathormone content, marked at that time in the blood, was equal to 239 pg/ml with the upper norm limit to 240 pg/ml. Four weeks after admission, neurological examination revealed no abnormalities in calcium-phosphatase balance, either. The patient was then transferred to the Endocrinological Clinic at the Silesian Medical Academy.

Epileptic attacks of metabolic origin are most common in young children. With age, frequency of metabolic ethiology violently decreases. The demonstrated pathological situation of the patient is an example of a serious course of clinical hypocalcemia which was manifested by recurrent convulsive attacks with the presence of pathological process in CNS excluded, which proves causality of neurological symptoms with acknowledged metabolic disorders.

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STRESZCZENIE

Przedstawiono sytuację chorobową pacjenta z powtarzającymi się napadami drgawkowymi, których przyczyną była stwierdzona badaniami diagnostycznymi hipokalcemia w przebiegu niedoczynności przytarczyc.