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**The dynamics of the state of neuronal complex of the brain in patients with aortic pathology operated on cardiopulmonary bypass and deep hypothermia.**

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To determine the state of the neuronal complexes of the brain in patients with aortic pathology, was done the thermographic and electroencephalographic study of 56 patients before and after surgery with cardiopulmonary bypass and deep hypothermia, using a verified dopplerosonografics color duplex scanning of the main arteries of the brain. Taking into consideration our developed "method for predicting psychosomatic conditions in cardiac patients with aortic pathology" in 20% (11 patients) of the cases identified EEG thermographic and dopplerosonografics verified depressive spectrum disorders in patients with aortic pathology after surgery. It is shown that the affective disorders in the perioperative period were significantly associated with autoregulated hymodynamic circuit of eth brain.

**Keywords:** bioelectrical activity of the brain, thermography, cardiopulmonary bypass, aortic pathology, hypothermia, dopplerosonografics.

Studies regaring EEG thermographic condition monitoring of neuronal complexes as the main functionality (Luria, 1982) subunits of the brain, have their own autoregulated hemodynamic circuit, in patients with aortic pathology were never before studied in the world in the context of the effect of cardiopulmonary bypass (CPB) and deep hypothermia.

**Objective:** To determine the state of the neuronal complexes of the brain of patients with aortic pathology operated on cardiopulmonary bypass and deep hypothermia.

Objectives: 1. Conduct a study of bioelectric activity of the brain in patients with aortic pathology before and after surgery with cardiopulmonary bypass and deep hypothermia;

2. Explore thermographic neuronal correlates of functional state of the brain complexes of patients with pathology of the aorta, before and after surgery with cardiopulmonary bypass and deep hypothermia.

3. To verify the data obtained in all patients before and after surgery perform color duplex scanning (CDS) of major cerebral arteries of the brain.

**Material and Methods**: was conducted the thermographic and electroencephalographic study of 56 patients with aortic pathology before and after surgery with cardiopulmonary bypass and deep hypothermia, using a verified dopplerosonografics CDS of the main arteries of the brain. Were used clinical-psychopathological, theoretical methods, methods of descriptive statistics and variation.

**Results:** 20% (11 patients) of the cases identified after surgery significant correlation between "cross-functional alpha-blocking" - activation of bioelectrical activity in the alpha range in the right frontal and left occipital EEG with the overall decrease in the index and the amplitude of the alpha rhythm, with the strengthening of the spectral density of the beta rhythm in these departments (irritation) and local hyperthermia in their respective areas of neuronal projection systems. In all of these patients were diagnosed psychiatric disorder of depressive spectrum after surgery.

During the CDS of the main arteries of the brain was used a method developed by us, "A method of predicting psychosomatic conditions in cardiac patients with aortic pathology."

The method is based on the fact that patients with dissecting aortic aneurysm before and / or after the surgery is performed CDS of the front (ACA), middle (SMAm1), rear (ZMAp1) cerebral arteries in both hemispheres via the temporal window and basilar arteries through the cervical access. By determining the diastolic flow velocity (Vd) is set in these arteries existence of hemodynamic insufficiency in the pool of cerebral arteries, respectively moderate when Vd <0.032 + 19 cm / s at AGR, Vd <0.015 + 19 cm / s to PMA, Vd < 18 + 0.033 cm / s ZMAp1 with relevant stakeholders and Vd <19 + 0.041 cm / s a.basilaris; established fact of hemodynamic insufficiency in the respective basin cerebral arteries respectively marked degree when Vd <9 + 0.012 cm / s AGR, Vd <9 + 0.014 cm / sec to PMA, Vd <8 + 0.013 cm / s with appropriate ZMAp1 side and Vd <0.021 + 5 cm / s a.basilaris. Determination of hemodynamic insufficiency is a moderate predictor of occurrence of depressive states in the post operative period (r = 0.83, p <0.03), which was confirmed in 20% of operated patients.

**Conclusion**

1.EEG-thermographic studies are promising to assess the effect of cardiopulmonary bypass and deep hypothermia on the state of the neuronal complexes of the brain;

2. In 20% (11 patients) of the cases identified EEG thermographic and dopplerosonografic verified depressive spectrum disorders in patients with aortic pathology after surgery.

3. Affective disorders in the perioperative period was significantly associated with autoregulated hemodynamic circuit of the brain.

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