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NEUROPHYSIOLOGICAL MECHANISMS OF BODY IMAGE AND THEIR DISORDERS

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Introduction. People can feel their bodies due to a variety of mechanisms in brain. Such processes attract scientific interest, because they can help to understand our brain more deeply, analyze multisensory integration in the cerebral cortex and its disruption. Disorders are rare, but interesting neurological pathologies. It is important to understand their mechanism, so that we can find treatment. [1]

Purpose. Analyze multisensory integration in the cerebral cortex and its disruption.

Materials and methods. The study applies scientometric analysis of scientific literature, using international scientific databasis, in particular Google Scholar, PubMed.

Results. Processing of interoceptive information plays an important role in the possession of own body. This sensation appears due to the combination of body signals and cognitive representation and processes of sensory integration. [2]

Mental body representation (MBR) provides touch perception, dimensional analysis of body parts, sense of body integrity. They form in the posterior parietal cortex (PPC) and constantly updated by signals from the primary somatosensory cortex. [3]

The processing of somatosensory information in the cerebral cortex has a hierarchical structure. Information is transmitted from the primary somatosensory cortex to the secondary and then to the associative regions of the. [4]

At the lowest level, simple tactile and proprioceptive signals are processed with

high precision. As the information becomes more complex and integrated, it combines different types of sensory data. In the secondary somatosensory cortex, further processing and integration of signals take place, after which they transmitted to higher level centers. The associative areas of the PPC provide the most complex level of analysis and integrate sensory information with other brain parts (motor or cognitive). [4]

Violation of MBR are shown in the phenomenon of phantom limb pain after amputation. Patients continue to feel the missing limb and pain in it. It`s because after amputation, the primary motor and somatosensory areas of the cortex previously controlled the limb stop to receive sensory information and are replaced by neighboring cortical areas. To reduce phantom pain can be used methods based on restoring sensory feedback. [5]

It can be mirror therapy, when patient sees a reflection of a healthy limb in the mirror and the illusion of moves in the missing limb. The illusion activates motor and sensory cortical areas and helps reduce pathological cortical reorganization. The similar mechanism is used in virtual reality in which patient can see and control a virtual limb. [5]

Conclusion. The sense of own body form through the integration of the body schema and sensory information in the cerebral cortex. Somatosensory information is processed hierarchically. This organization allows brain to perceive, interpret different types of sensory information.

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