Short Communication

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Optics "clear vision", storozhynets, chernivtsi region, Ukraine

Abstract

Manifestation of ocular symptoms in severe covid patients reaches 30% - 60% of cases. This high frequency of involvement of the visual analyzer in the pathological process is explained as follows: the visual system is very energy consuming, and when the general condition of the body is severe, the brain blocks the visual analyzer (motor and / or sensory parts) to pay more attention to other vital organs and systems (paralysis of motor activity of the eye muscles or a significant drop in visual acuity saves brain resources). In severe Covid -19, it is proposed to switch the visual analyzer to «energy saving mode»: turn off the pupillary response and accommodation (cycloplegics) and close the eyes with a bandage (for a while). These manipulations (artificial blocking of the visual analyzer) can improve the overall condition of the patient and reduce the risk of blindness.

Keywords: Covid -19, ocular symptoms, visual analyzer blockage

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Introduction

Topicality. The Covid -19 pandemic is a serious medical and social problem.[1-3] The disease affects every organ of the human body. Manifestation of ocular symptoms in covid patients with severe pathology reaches 32% of cases.[4] In intensive care units, the frequency of ocular complications in patients with acute respiratory distress syndrome - up to 60% of cases.[5] Observe the following disorders of the anterior segment of the eye: conjunctivitis, episcleritis, keratitis. In the posterior segment: occlusion of the central retinal vein and central retinal artery, acute retinal necrosis, optic neuritis, ischemic neurooptic opathy. Neuro-ophthalmic manifestations: tonic pupil of Adi, paralysis of oculomotor nerves, neurogenic ptosis.[4]

Why is the visual analyzer so often involved in the pathological process of Covid-19 ? We can give the following explanation.

The visual analyzer is very energy-intensive - its work is serviced by 6 pairs of cranial nerves (half of the 12 available). When the general condition of the body is severe, the brain is in a row In some cases, it tries to "make life easier" by blocking the visual analyzer (as a result, a significant part of energy resources is saved and the brain can pay more attention to other vital organs and systems).[6]

The brain chooses different ways to block the visual analyzer (motor and/or sensory parts): paralytic strabismus, paralytic mydriasis, retinal and optic nerve occlusion, optic neuritis, retinal detachment, metastases to the central part of the fundus (in oncology) and. This paralyzes the motor activity of the eye muscles or sharply decreases visual acuity, which significantly saves brain resources.

In each case, the brain calculates the most ergonomic way to "turn off" the visual system, so as not to deplete the brain processes, which is realized in neuro-mental or somatic diseases.

Similarly, with Covid-19, the brain works with olfactory and gustatory analyzers. Studies have shown that the loss of sensations of smell and taste involves central mechanisms, rather than peripheral.[7] That is, by temporarily blocking the sense of smell and taste, the brain also "makes life easier" to better control the state of the body as a whole.

Let's go back to the visual analyzer.

It is known that coronavirus infection in patients with chronic comorbidities (hypertension, diabetes, obesity) often has hypercoagulation - blood clots in arteries and veins: myocardial infarction, stroke, pulmonary embolism, renal failure [venous insufficiency, thrombosis 5.

According to our clinical observations, in thrombosis of the central retinal vein on the background of the covid (block of the sensory part of the visual system) other blood clots in the body of patients are not formed. That is, the brain, by "disabling" the visual analyzer, protects other vital organs from destruction. In other words, the body pays with partial blindness for its relative well-being ("chooses less out of two disasters").

Indicative in this respect is such an ocular complication of covid as the tonic pupil of Adi: the pupil is pathologically dilated, does not respond to light - paralytic mydriasis; the patient has difficulty reading - paralysis of accommodation (synergistic innervation of the muscles of the iris and ciliary body). No wonder central retinal vein thrombosis is treated under the cycloplegic homatropin:[4] a block of 2 muscles - the pupillary sphincter and accommodation muscle (one of the most active muscles in the body) - saves brain resources and improves treatment outcomes.

We used the cycloplegic atropine in the standard treatment of optic neuritis, anterior ischemic neurooptic opathy: visual treatment results were statistically higher and were achieved in a shorter time compared to traditional therapy without atropine.[6]

How can we use knowledge of the laws of operation of the visual analyzer in severe Covid-19 ?

In our opinion, it is necessary to transfer the visual analyzer to the "energy-saving mode": disable the pupillary response and accommodation (cycloplegia), give a tight blindfold for a while (motor and sensory unit of the visual system). This should reduce the risk of somatic complications of covid.

Paralytic mydriasis can also help prevent the neuropsychiatric consequences of coronavirus: depression, psychosis, parkinsonism,

Alzheimer's disease. It has been shown that mental health deteriorates with pupillary narrowing.[8,9] Thus, dilation of the pupil can have the opposite positive effect, so it is necessary to drip cycloplegics for a long time. A healthy lifestyle, observance of God's Commandments, and good deeds also contribute to pupil dilation.

In paralytic mydriasis in the long term it is advisable to wear dark with holes " Laser-Vision " glasses , which protect the retina from glare and mimic natural accommodation.

Conclusion

1. Manifestation of ocular symptoms in severe covid patients reaches 30% -60% of cases.
2. The visual analyzer is very energy consuming, and in cases of severe general condition of the body, the brain blocks the visual analyzer (motor and / or sensory parts) to save resources for other vital organs and systems.
3. It is suggested that in visual patients with severe comorbidities, the visual analyzer should be switched to «energy-saving mode»: disable pupillary response and accommodation (cycloplegia) and close the eyes with a bandage (for a while).
4. These manipulations (artificial blocking of the visual analyzer) can improve the overall condition of the patient and reduce the risk of blindness.

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