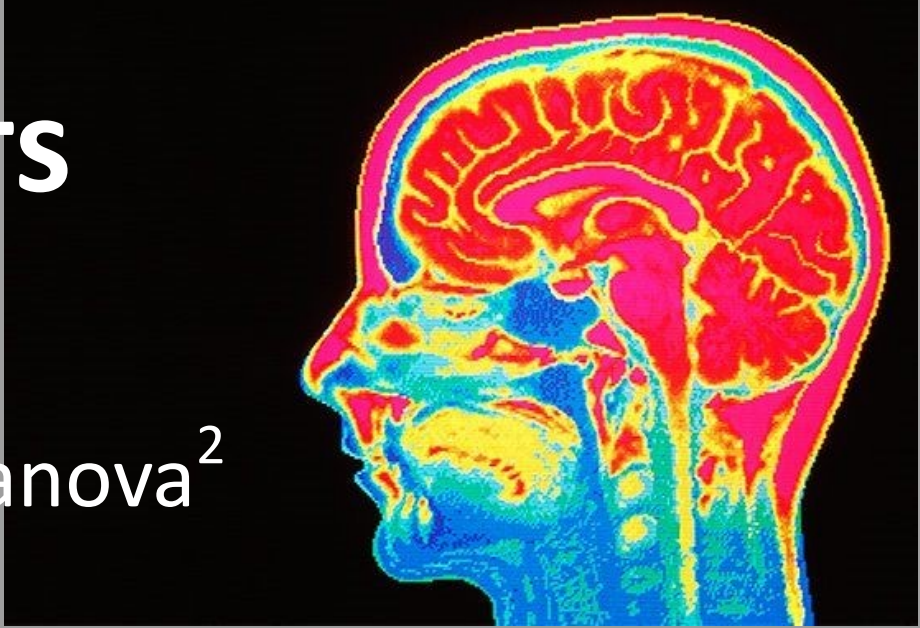




COGNITIVE VISUAL IMPAIRMENTS IN TRAUMATIC BRAIN INJURY

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ABSTRACT

More than 10 million people all over the world suffer from traumatic brain injury (TBI) each year. The problem of the TBI is actual due to its influence on various aspects of the patient's quality of life, including cognitive, behavioral, emotional and physical aspects, which affect the interpersonal, social and professional activity of a person. Frequent consequence of TBI of different degrees of severity is the damage to the visual analyzer. The leading manifestations of functional disorders include defects of the central and peripheral vision, disorders of color perception, binocular vision, significant violations of reading and writing, etc.

However, there are such patients whose visual disorders are associated with impaired higher levels perception, which are difficult in terms of existing visual dysfunctions diagnosis and objectification. Such patients have violations of the visual-spatial feeling, disorders of processing and analysis of complex visual scenes and images, difficulties in recognizing certain aspects of the surrounding world, as well as the presence of visual phenomena that are objectively absent. Such visual disorders are called cognitive.

The difficulties of diagnosing these disorders are characterized by the following circumstances: the lack of parallelism between the ophthalmoscopic picture and the change in visual functions; features of the topography of the lesion of the optic tract: the farther from the eyeball is the main pathological focus – the later changes occur in the fundus. The lesion of the central neuron of the visual pathway, the cortex and the subcortical visual centers of the brain do not appear ophthalmoscopically.

Therefore, modern methods of neuroimaging (such as: CT, MRI, functional MRI, PET etc.) play an important role in the objectification of cognitive visual disorders. It becomes possible to identify the morphological substrate of the visual impairment with their help. In addition, it is advisable to supplement these studies with a neurological examination, neuropsychological testing and assessment of the quality of life related to health.

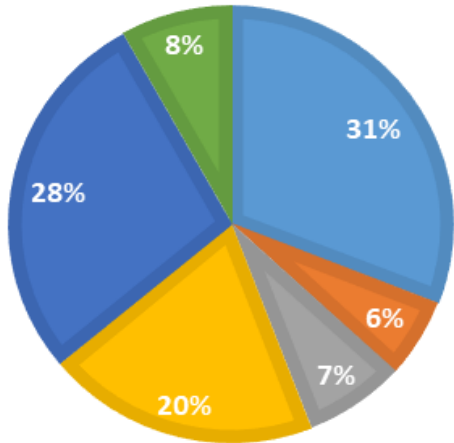
MATERIALS AND METHODS

- 100 patients with severe traumatic brain injury (74 men and 16 women)
- History 18 month Severe Traumatic Brain Injury
- Age range 18—54
- Post-traumatic changes evidenced by CT, MRI
- Clinical and neurological examination, complex ophthalmological examination (visual acuity assessment, visual fields assessment, accommodation, papillary function and vergence, ophthalmoscopy, color vision assessment, optic coherence tomography, visual evoked potentials visual perception and motion perception assessment, visual memory and object recognition assessment, assessment, reading and writing test, visual hallucinations presence\absence

RESULTS

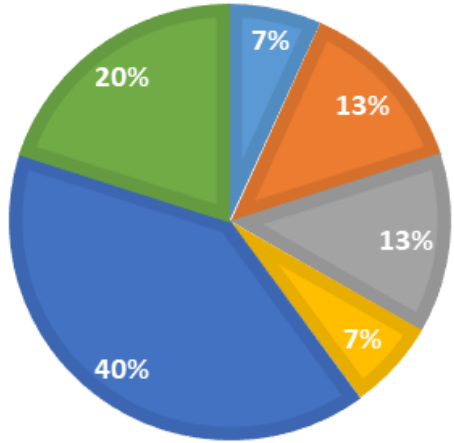
MOST FREQUENT VISUAL IMPAIRMENTS IN SEVERE TBI PATIENTS 18 MONTHS POSTINJURY (N=100)

Poor Visual Acuity
Binocular vision impairments
Optic nerve atrophy (OCT findings)
Color vision impairments
Visual fields disturbances
Cognitive visual impairments



PREVALENCE AND CLINICAL CHARACTERISTICS OF THE DIFFERENT TYPES OF COGNITIVE VISUAL IMPAIRMENTS (N=11)

Balint syndrome
Central achromatopsia
Visual agnosia
Reading and writing difficulties
Prosopagnosia
Complex syndromes



64% (N=64) patients with the history of severe TBI had different types of visual impairments. 11% (N=11) had cognitive visual dysfunctions.

CONCLUSIONS

Severe TBI is associated with a variety of visual problems, involving more complex aspects of visual perception and cognitive functions with a decline in ocular and overall health. Patients with chronic visual dysfunction after TBI may require visual, cognitive, occupational and other forms of physical therapy.

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