HEMIANOPSIA - PERSONAL RESEARCH

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Abstract: *The purpose of this study is to describe the clinical characteristics and clinical-anatomic correlations of hemianopsia. Hemianopsia impairs visual function and frequently precludes driving. Demographic characteristics, risk factors, characteristics of visual field defects, causes of visual field defects, neuroradiologic definition of lesion location, and associated neurological deficits were recorded.*

Keywords: *homonymous hemianopsia, risk factors, visual field, ophthalmologic signs, neurological signs, neuroradiologic location.*

Rezumat: *Scopul studiului de faţă este descrierea caracteristicilor clinice şi corelaţiilor anatomo-clinice ale hemianopsiei. Hemianopsia slăbeşte funcţia vizuală şi împiedică frecvent coordonarea pacientului. Au fost înregistrate caracteristicile demografice, factorii de risc, caracteristicile defectelor câmpului vizual, cauzele defectelor câmpului vizual, definiţia neuroradiologică a locaţiei leziunii şi asocierea deficitelor neurologice.*

Cuvinte cheie: *hemianopsia homonimă, factori de risc, câmp vizual, semne oftalmologice, semne neurologice, localizare neuroradiologică.*

MATERIAL AND METHOD

I studied the ophthalmologic disorders in the patients suffering from ischemic cerebrovascular diseases, hospitalized in the Neurology Section of the County Emergency Clinical Hospital of Sibiu, between September 1999 and April 2007.

A number of 274 patients were diagnosticated with hemianopsia within the context of ischemic attacks (transient, progressive, regressive, complete) regarding the carotidian and vertebrobasilar system, as well as regarding the cerebral atherosclerosis.

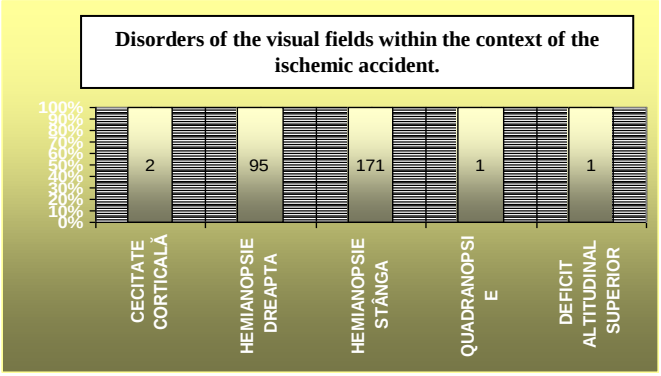
RESULTS

The visual field exam may reveal the presence of an intracranial lesion or even its location, being important in the topographic diagnosis. The definitive vascular lesions are translated through a constant and irreversible defect of the visual field. Each type of homonymous hemianopsia was found in all lesions placed along the retrochiasmic visual ways. Lateral homonymous hemianopsia is encountered in the lesions between the optic band and the edge of the occipital lobe. It is partial or total in the posterior lesions of the optic radiations (occipital pole).

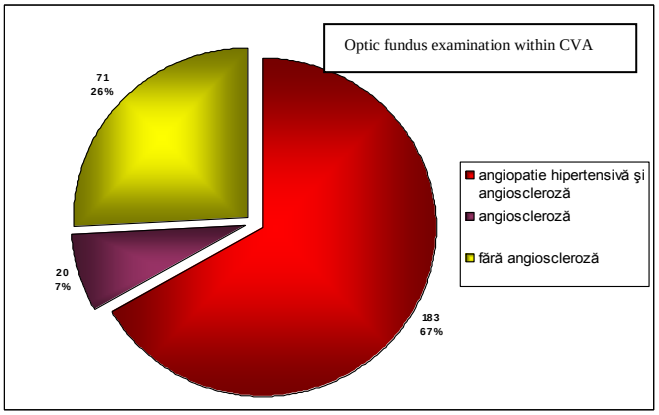
Congruent lateral hemianopsia is due to the posterior lesions of the bands, lesions of the external geniculate bodies and to the optic radiations.

Incongruent lateral homonymous hemianopsia is encountered in the anterior lesions of the optic bands (“NEUROOFTALMOLOGIE” C. Arseni).

Picture no. 1. Disorders of the visual fields within the context of the ischemic accident.



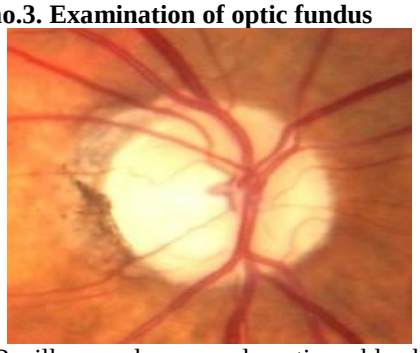
Picture no. 2. Optic fundus examination within the context of an ischemic cerebrovascular accident.



The insufficiency of the ophthalmic artery may bring about crises of transitory amaurosis. The optic fundus examination revealed: hypertensive angiopathy, angiosclerosis, ocular semiology within the ischemic attacks of the carotidian system.

As a sign of hemisphere, I noticed: visual field disorders under the form of homonymous hemianopsia (intersection of the optic radiations in the visual field) or even blindness through optic atrophy.

Picture no.3. Examination of optic fundus



Papillary edema and retina bleedings are exceptional. The syndrome of anterior cerebral artery does not give ocular signs.

Middle cerebral artery syndrome:

a) Total silvian softening: homonymous ocular semiology;

b) Profound silvian softening: ocular semiology: without signs;

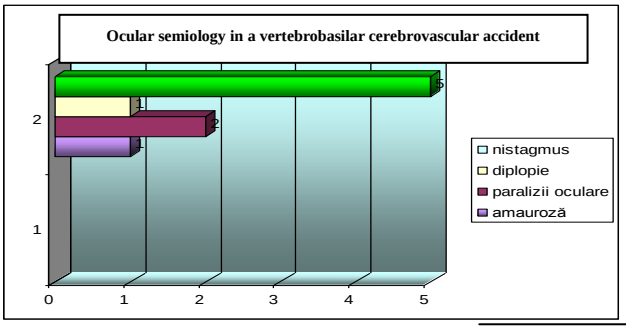
c) Great superficial silvian softening: hemianopsia is inconsistent and occurs when the lesions extent to the optic radiations when passing through the external wall of the lateral ventricle;

d) Posterior silvian softening: ocular semiology: homonymous hemianopsia that has a large value in the topographic diagnosis; difficulty in provoking the optokinetic nystagmus.

Anterior choroidien artery syndrome – ocular semiology: homonymous hemianopsia sometimes limited to the upper quadrant of the visual field. Monnier and Walthard quote mydiriasis as a rarity, accompanied by the absence of the papillary reaction to light, also complicated by the central scotoma "NEUROOFTALMOLOGIE" Arseni C.).

Ocular semiology in the ischemic attacks of the vertebrobasilar system: decrease of the visual acuity up to amaurosis or hemianopsic disorders (due to irrigation disorders on the posterior cerebral artery), papillary alterations, ocular paralyses, diplopia, nystagmus, the decrease or the abolition of the corneous reflex (v), visual eclipses, signs of Claude Bernard – Horner series, („NEUROOFTALMOLOGIE" Arseni C.)

Picture no. 4. Ocular semiology within a vertebrobasilar cerebrovascular accident.



Signs and symptoms:

If the affected cerebral area contains one of the three prominent tracts of the central nervous system – spinothalamic tract, corticospinal tract and the dorsal column [medial lemniscus], the symptoms may include:

- Hemiplegia and muscle weakness of the face;
- Drowsiness;
- Sensorial reduction or vibratory feeling.

In most of the cases, the symptoms affect only a part of the body. The brain defect is usually on the opposite region of the body [dependence on each part of the affected brain]. Yet, the presence of one of these symptoms does not necessarily suggest an ischemic stroke. Meanwhile, these tracts also pass in the spinal marrow and any lesion may produce these symptoms.

The cerebral trunk also contains 12 cranial nerves. The cerebral vascular accident affects the cerebral trunk, so it may produce symptoms relative to the deficits of these cranial nerves:

- Alteration of smell, taste, hearing or sight [totally or partially];
- Fall of eyelids [ptosis] and the weakness of the ocular muscles;
- Decrease of reflexes: in swallowing, papillary reactivity to light;
- Decrease of the feelings and muscle weakness of the face;
- Balance problems and nystagmus;
- Alteration of the respiratory system and cardiac rhythm;
- Weakness in the sternocleidomastoid muscle with inability when turning the head sidewards;
- Weakness in language [incapacity of moving the tongue outside and/or sideward].

If the cerebral cortex is involved, the tracts of the central nervous system may be affected again and may produce the following symptoms:

- Aphasia [incapacity of speaking or understanding the language, because of the involvement of the area of Broca or Wernike];
- Apraxia [alteration of the voluntary movements];
- Deficits of visual field;
- Memory deficits [the involvement of the temporal lobe];
- hemineglígence [involvement of the parietal lobe];
- disorganized thinking, confusion, hypersexual gestures [with the evolution of the frontal lobe];

If cerebellum is involved, the patients may have the following symptoms:

- difficulty in walking;
- alteration of the movements coordination;
- dizziness or disequilibrium.

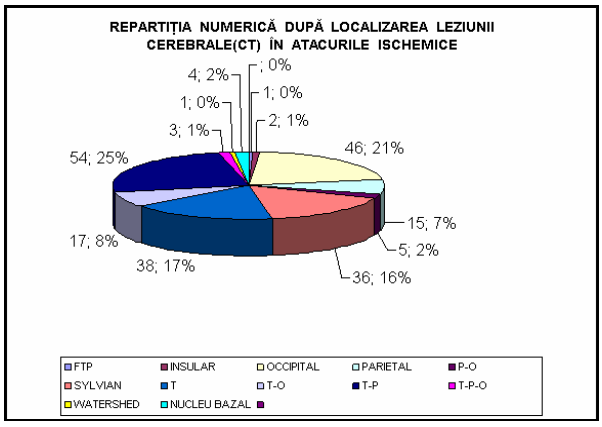
Loss of conscience, headaches and vomiting usually occur rather in the hemorrhagic cerebral vascular accident than in thrombosis because of the increase of the intracranial pressure, as a result of the compression of the flux flow on the brain. If the symptoms are at maximum

in the moment of the accident, the cause is likely to be a subarachoidal haemorrhage or an embolic CVA.

Neurological semiology within the context of a vertebrobasilar cerebrovascular accident:

- recurrent hemiplegia alternating from one episode to another, paroxysmal cephalagia, dizziness;
- recurrent confusional dizziness (through circulatory insufficiency regarding the rostral region of mesencephalon and thalamo-hypothalamic and depending on the lesion extension of the reticulate substance);
- speech disorders, either through bulbar lesions or through supranuclear lesions of pseudo-bulbar type, or cerebral);
- vegetative phenomena (cardiorespiratory or thermal deregulation ("NEUROOFTALMOLOGIE" Arseni C.).

Picture no. 5. Numeric distribution taking into account the location of the cerebral lesion in the ischemic accidents.



The majority of the lesions were placed in the occipital lobe, parietal lobe, temporal lobe optic tract and in the lateral geniculate nuclei.

CONCLUSIONS

1. An increase of the incidence of the ischemic cerebral vascular accident; the majority of the patients are above 65 years old;
2. There is a larger incidence of the ischemic cerebral vascular accident in men;
3. Atherosclerosis represents the most frequent cause of arteries stenosation that provides the cerebral irrigation;
4. The changes of the cerebral arteries are produced by arterial hypertension and diabetes mellitus;
5. Many cardiac diseases are associated to an increased risk for the ischemic cerebral vascular accident;
6. Other risk factors: cholesterol, obesity, anemia, smoking;
7. The largest part of the cerebral infracts are produced by the thromboembolic processes that determine acute arterial occlusion;
8. The visual filed examination may reveal the presence of an intracranial lesion, even its location, being important in the topographic diagnosis;
9. The optic fundus examination revealed: hypertensive angiopathy, angiosclerosis,

Neurological signs: affected cerebral area contains one of the three prominent tracts of the central nervous system – spinothalamic tract, corticospinal tract and the dorsal column [medial lemniscus], the symptoms may include:

- Hemiplegia and muscle weakness of the face;
- Drowsiness;
- Sensorial reduction or vibratory feeling.

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