

Oligodendroglial change dynamics in perifocal critical zones of brain infarction in state of progression

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Introduction

Brain infarction nucleus is surrounded by zone of tissue critical level metabolism, which called "ischemic penumbra". Nervous tissue changes of this zone are preserved for a long time, reflecting the process of infarct deformation. To better understanding nervous tissue adaptation in the progression state of brain infarction it is necessary to study in details the oligodendroglial response to acute ischemia.

Aim

Using pathohistological methods to study the dynamics of oligodendroglia changes in brain infarction critical zones.

Materials and methods

It was used 50 section cases of progressive hemispheric cerebral infarction in the the middle cerebral artery pool. In each case it was taken 4 slices of tissue bordering necrosis area and after 2, 5 and 7 cm from the edge of necrosis. Pieces were fixed in 10% formalin, pouring paraffin and made hematoxylin-eosin slices, also it was used silver impregnation elective technique by Ortega to identify oligodendroglia. The sections were studied under a microscope Axioplan 2 («Carl Zeiss», Germany).

Results

Elective oligodendroglial silver impregnation identify in critical zones of cerebral infarction is not successful - with the processes they are stained in single items only in the peripheral portion of the critical areas. On hematoxylin-eosin slices perineuronal oligodendrocytes undergo changes such as in the adjacent neurons: in necrosis are predominant karyolytic processes, in perifocal zones - multidirectional changes, almost identical to those in "their" neurons. In interfascicular oligodendrocytes of necrotic area is observed a clear decrease in tinctorial sensitivity of cell nuclei (hematoxylin pale coloring), in the perifocal areas - unusual for a norm nuclear polymorphism (size, density and contours). In later periods (3-9 days of disease) there are the most notable changes in interfascicular cells. These changes are associated with deeper and more widespread than in the beginning of the disease destructive processes in pathways of white matter and presented in pronounced discomplexation of cells (violation linearly arranged along myelinated nerve fibers), polymorphism of nuclei, converting in the so-called "drainage cells" - on hematoxylin-eosin slices cytoplasmatic granular eosinophilic rim becomes noticeable in these cells.

Conclusion

With the progression of cerebral infarction satellite oligodendrocytes basically repeat changes of neurons: in necrotic foci prevails karyocytolysis in perifocal zones - multidirectional changes. In interfascicular oligodendrocytes there are reduced tinctorial sensitivity of cell nuclei and appears unusual for a norm polymorphism of nuclei.