RADIATION PREDICTORS’ OUTCOMES OF ISCHEMIC STROKE

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The mortality rate from stroke in Russia is high and makes up to 175 people per 100 thousand populations.

As a result of the first stroke 21.4% die.

Ischemic stroke occurs five times more often than hemorrhagic and is up to 80%.
The purpose of this study

estimate predictors that determine prognosis of outcome of acute disorders of cerebral circulation by ischemic type.
Materials and methods

- A comprehensive examination of 140 patients with acute violation of cerebral circulation (main group) and 30 people without any pathological changes (control group or comparison group).

- The examination included native spiral computed tomography with the definition of the density of stem structures of the brain, CT-perfusion with quantification of blood flow in the brain stem and duplex scanning extra- and intracranial segments of the vertebral and basilar arteries.
10 patients died, a mortality of 7.1%.
The main causes of death in all cases were swelling and dislocation of the brain with ischemic disorders in the brain stem (at the level of the midbrain).
- 1 – tentorial foramen
- 2 – midbrain
- 3 – cerebral peduncles
- 4 – oculomotor nerves
- 5 – optic chiasma
Density of the brain stem in control group at the level of the tentorial foramen was 34.0±1.1 HU
## Indicators at the level of the tentorial foramen

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Survivor</th>
<th>Dead</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density of the brain stem (HU)</td>
<td>30.8±3.5</td>
<td>28.5±0.9</td>
<td>0.062</td>
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<tr>
<td>Blood flow in the brain stem (ml/100 g/min)</td>
<td>45.6±5.2</td>
<td>30.2±3.3</td>
<td>0.832</td>
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Density of the midbrain in main group at the level of the tentorial foramen was 28.5±0.9 HU (p<0.05)
Histogram of cerebral blood flow (CBF) ml/100g/min at the level of midbrain: cerebral peduncle r. (a), cerebral peduncle l. (b), tegmentum of midbrain (c).
CT and CT-perfusion of 72-year-old patient with ischemic stroke.

There is a decrease in blood flow in the left temporal lobe and brain stem.
Prognostically unfavorable reduction of blood flow in the brain stem below 24 ml/100 g/min.
Duplex scanning of intracranial part vertebral and basilar arteries in control group.

Speed indicators and indexes of peripheral resistance within the specified values.
Duplex scanning of vertebral and basilar arteries in the main group.

The decrease in speed performance and a marked increase in the indexes of peripheral resistance according to the type of blood flow "poor perfusion".
Conclusions

Native spiral CT with the investigation of the density of the brain stem at the level of the tentorial foramen, CT-perfusion measurement of blood flow in the midbrain and the basilar and vertebral arteries using Doppler sonography allows a high degree of reliability to determine the prognosis of ischemic stroke (patent of investigation № 2598459 RU).
Thanks for attention!