

COMPARATIVE CHARACTERISTICS AND DYNAMICS OF IL-20 AND VEGF IN ISCHEMIC AND HEMORRHAGIC STROKE.

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Background. Ischemic and hemorrhagic stroke are accompanied by a systemic inflammatory response, endothelial injury, and alterations in angiogenic activity. Interleukin-20 (IL-20), a member of the IL-10 cytokine family, is involved in the regulation of inflammation and endothelial function, whereas vascular endothelial growth factor (VEGF) has complex effects, including stimulation of angiogenesis, support of neurovascular remodeling, and increased vascular permeability. Changes in IL-20 and VEGF in different types of stroke remain insufficiently understood.

Objective. To compare IL-20 and VEGF concentrations at admission and evaluate their dynamics during treatment in patients with ischemic and hemorrhagic stroke.

Materials and Methods. This single-center pilot observational study included 35 patients: 22 with ischemic stroke and 13 with hemorrhagic stroke. Plasma IL-20 and VEGF concentrations were determined at admission and reassessed during treatment. The concentrations of both biomarkers were expressed in pg/mL. Paired measurements were available for 20 patients with ischemic stroke and 7 patients with hemorrhagic stroke. Because of the skewed distribution of the data, results are presented as median and interquartile range: Me [Q1–Q3]. Independent groups were compared using the Mann–Whitney U test, while paired measurements were analyzed using the Wilcoxon signed-rank test. The Benjamini–Hochberg procedure was applied to adjust for multiple comparisons.

Results. At admission, IL-20 concentrations did not differ significantly between patients with ischemic and hemorrhagic stroke: 2.157 [2.131–2.281] versus 2.150 [2.130–3.297] pg/mL, respectively; $p=0.973$. Baseline VEGF concentrations were also comparable: 305.334 [215.704–640.000] versus 287.979 [231.228–581.526] pg/mL; $p=0.932$.

In patients with ischemic stroke, no significant change in IL-20 was observed: 2.172 [2.126–2.298] pg/mL at the first measurement and 2.164 [2.107–2.220] pg/mL at the second measurement; $p=0.869$. VEGF concentrations were 338.531 [228.146–672.396] and 440.825 [248.898–694.495] pg/mL, respectively; $p=0.841$.

In patients with hemorrhagic stroke, IL-20 concentrations also remained unchanged: 2.150 [2.089–2.756] versus 2.116 [2.116–2.665] pg/mL; $p=0.469$. In contrast, VEGF concentrations decreased from 564.535 [259.603–581.526] to 186.996 [163.542–235.060] pg/mL; nominal $p=0.047$. However, this difference did not remain statistically significant after adjustment for the two comparisons: $q=0.094$.

Discussion. The findings demonstrated no differences in baseline IL-20 or VEGF concentrations between the two stroke types. The observed reduction in VEGF in hemorrhagic stroke may reflect temporal changes in endothelial activation and vascular permeability. Current evidence suggests that the relationship between VEGF and cerebrovascular injury is complex and stroke subtype-dependent, with intracerebral hemorrhage and different ischemic stroke subtypes potentially showing divergent associations with VEGF [1]. The absence of a baseline difference in VEGF is also consistent with evidence indicating that circulating VEGF cannot be considered a specific causal marker of ischemic stroke [2]. Interpretation of the observed VEGF dynamics is limited by the small number of paired observations in the hemorrhagic stroke group.

Conclusions. Baseline IL-20 and VEGF concentrations did not differ between ischemic and hemorrhagic stroke. A trend toward decreased VEGF during treatment was observed in hemorrhagic stroke, but this finding requires confirmation in a larger cohort. No significant changes in IL-20 were identified.

References

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