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Circulating Serum VEGF, IGF-1 and MMP-9 and Expression of their Genes as Potential Prognostic Markers of Recovery in Post-Stroke Rehabilitation - A Prospective Observational Study

Topic: Molecular and Cellular Biology

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BACKGROUND

There are no prognostic biomarkers to identify stroke recovery and to support decisions regarding stroke care and rehabilitation. The first three months following a stroke are crucial for recovery due to the high levels of spontaneous and therapeutic-induced neuroplasticity, angiogenesis, and reperfusion. This study aims to assess the expression of VEGF, IGF-1, and MMP-9 proteins, along with their corresponding genes, to identify potential biomarkers for predicting brain repair capacity and assessing stroke outcomes. Additionally, the study explores possible correlations with clinical scales, such as cognitive and depression assessments.

METHODS

The study cohort consisted of 32 patients with moderate ischemic stroke severity, three to four weeks post-incident.

RESULTS

Results from a three-week hospitalization revealed statistically significant changes in clinical parameters, as well as in the expression of MMP9 and VEGF proteins and mRNA, throughout the rehabilitation period. Our findings suggest that the combined expression of MMP9 protein and mRNA could serve as a valuable biomarker for cognitive improvement in post-stroke patients, showing 87% sensitivity and 71% specificity ($p < 0.0001$).

CONCLUSION

Among the analyzed proteins and mRNAs, significant changes were observed in plasma MMP-9 and VEGF protein content over a three-week follow-up time. Particularly, MMP-9 appears to be a promising molecule as a biomarker of cognitive recovery in the subacute phase, which should encourage a further multicenter confirmatory study.

Statement of Disclosures

None

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