Editorial
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Editors' Pick in January 2025

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In this issue, we feature 10 articles, including one laboratory research paper, eight clinical studies, and one letter to the editor. Among these, the editorial board would like to highlight two noteworthy clinical studies. The first is a genomic study on patients with low-grade glioma, exploring the prognostic role of spermine synthase. The second is a clinical study that aimed to predict the recurrence of facial spasms after microvascular decompression using a specific magnetic resonance imaging (MRI) technique.

Spermine Synthase : A Potential Prognostic Marker for Lower-Grade Gliomas[3]

Spermine synthase (SMS) is a polyamine biosynthetic enzyme involved in critical biological processes such as cell proliferation, differentiation, and apoptosis[1,5]. In this study, the authors identified SMS as a key factor in tumor development and prognosis in lower-grade gliomas (LGGs).

To evaluate the clinical and pathological significance of SMS, they performed quantitative genetic analyses using datasets from 523 LGG patients and 1152 normal brain tissue samples[3]. These data were obtained from the Cancer Genome Atlas (TCGA) for LGG patients and the Genotype-Tissue Expression (GTEx) database for normal tissues. LGG patients were categorized into high- and low-expression groups based on SMS levels, and clinical and pathological differences between the two groups were analyzed. SMS expression levels were also examined in relation to pathological characteristics, immune cell infiltration, cell cycle regulation, apoptosis, cell proliferation, and clonal formation.

The analysis revealed that SMS expression levels differed significantly between low-grade gliomas and normal brain tissue. High SMS expression was strongly correlated with immune cell infiltration, including eosinophils, neutrophils, T lymphocytes, and macrophages. Additionally, elevated SMS levels were associated with unfavorable clinical features, such as older age at onset (>40 years), more aggressive histological subtypes (e.g., astrocytoma), higher tumor grades (grade >3), wild-type isocitrate dehydrogenase status, and poorer clinical outcomes. High SMS expression was further identified as an independent risk factor for reduced overall survival in LGG patients.

These findings suggest that SMS plays a critical role in the progression and prognosis of LGG and may serve as a potential prognostic biomarker for developing targeted treatment strategies.

This study has strong academic value due to its use of robust datasets, novel insights into SMS as a prognostic biomarker, and implications for clinical application. However, its reliance on correlational data, lack of experimental validation, and lim-

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ited mechanistic exploration are limitations that future research should address to strengthen its scientific impact.

Prediction of Hemifacial Spasm Re-Appearing Phenomenon after Microvascular Decompression Surgery in Patients with Hemifacial Spasm Using Dynamic Susceptibility Contrast Perfusion Magnetic Resonance Imaging[2)]

Potential causes of reappearing facial spasms include incomplete decompression, revascularization or adhesion, nerve injury, and residual hyperexcitability[4)]. To predict this reappearing phenomenon before surgery, the authors used dynamic susceptibility contrast (DSC) perfusion MRI[2)]. Since DSC MRI can evaluate the integrity of the blood-brain barrier, it was hypothesized to be a useful tool for identifying facial nerve injury due to persistent neurovascular conflict.

The study retrospectively reviewed the medical records of 83 patients who underwent microvascular decompression surgery and had DSC perfusion MRI prior to the procedure. These patients were divided into two groups : group A (32 patients) experienced early recurrence of hemifacial spasm, while group B (28 patients) did not. Receiver operating characteristic (ROC) curve analysis and machine learning methods were employed to predict early recurrence.

Voxel-based analysis revealed reduced cerebral blood flow in several brain regions, including the cerebellum, culmen, cingulate gyrus, and precuneus, among patients in the reappearing group. In the ROC analysis, the right amygdala exhibited the highest area under the curve (AUC) value, indicating that changes in cerebral blood flow in this region had the strongest predictive value for symptom reappearance. Machine learning analysis further demonstrated that the naïve Bayes (NB) model provided the best prediction of early recurrence, combining three different extraction fraction values at the middle temporal gyrus, posterior cingulate, and brainstem, along with patient age.

The authors concluded that integrating DSC MRI with advanced analytic techniques can effectively differentiate between patients likely to experience early recurrence and those who are not. The findings have potential practical value, suggesting that neurosurgeons could use these predictive methods to better identify high-risk patients and tailor postoperative management strategies.

AUTHOR'S DECLARATION

Conflicts of interest

No other potential conflict of interest relevant to this article was reported.

Author contributions

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