Subarachnoid hemorrhage mouse model

Preclinical experimental studies

He et al. aim to investigate whether Dental Pulp Stem Cells can improve early brain injury after subarachnoid hemorrhage, and explore the mechanisms. In the study, they utilized the endovascular perforation method to establish a subarachnoid hemorrhage mouse model and investigated whether DPSCs administered via tail vein injection could improve EBI after SAH. Furthermore, they used hemin-stimulated HT22 cells to simulate neuronal cell injury induced by SAH and employed a co-culture approach to examine the effects of DPSCs on these cells. To gain insights into the potential mechanisms underlying the improvement of SAH-induced EBI by DPSCs, they conducted bioinformatics analysis. Finally, they further validated the findings through experiments. In vivo experiments, they found that DPSCs administration improved neurological dysfunction, reduced brain edema, and prevented neuronal apoptosis in SAH mice. Additionally, they observed a decrease in the expression level of miR-26a-5p in the cortical tissues of SAH mice, which was significantly increased following intravenous injection of DPSCs. Through bioinformatics and luciferase reporter assay, they confirmed the target relationship between miR-26a-5p and PTEN. Moreover, we demonstrated that DPSCs exerted neuroprotective effects by modulating the miR-26a-5p/PTEN/AKT pathway. The study demonstrates that DPSCs can improve EBI after SAH through the miR-26a-5p/PTEN/AKT pathway, laying a foundation for the application of DPSCs in SAH treatment. These findings provide a theoretical basis for further investigating the therapeutic mechanisms of DPSCs and developing novel subarachnoid hemorrhage treatment research strategies [1].

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He P, Zhang H, Wang J, Guo Y, Tian Q, Liu C, Gong P, Ye Q, Peng Y, Li M. Dental Pulp Stem Cells Attenuate Early Brain Injury After Subarachnoid Hemorrhage via miR-26a-5p/PTEN/AKT Pathway. Neurochem Res. 2025 Jan 30;50(2):91. doi: 10.1007/s11064-025-04340-y. PMID: 39883266.