



Expression of NOTCH1 intracellular domain in intracranial meningioma

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Introduction: Intracranial meningioma count for one of the most common primary brain tumors. Although mostly benign, small portion of meningioma can develop malignant characteristics. Aberrant cellular signalling can lead to tumorigenesis, but the underlying mechanism of meningioma progression is still unknown. Notch signalling pathway has a role in maintaining neural progenitor cells during embryogenesis. In tumorigenesis, activation of this signalling pathway can lead to proliferation, invasion and progression. One of the main molecular actors of the pathway is NOTCH1. Translocation of Notch intracellular domain (NICD) to the nucleus can commence transcription of oncogenes. Information on the role of NICD in meningioma is still scarce.

Aim: The aim of this study was to investigate expression and localization of NOTCH1 intracellular domain in different grades of meningioma.

Materials & Methods: Formalin-fixed paraffin-embedded sections were collected from 56 patients diagnosed with meningioma tumors of different grades. In order to study expression and localization of NICD in meningioma sections, we used DAB-labelled immunohistochemical reaction with Anti-Notch1 intracellular domain antibody (ab8287, Abcam, Cambridge, UK). Healthy brain tissue from cortex was also analysed, and results were compared to the ones of tumor samples.

Results: In healthy brain tissue we observed high cytoplasmic expression of NCID (IRS=12). However, the translocation of NICD into nuclei was absent. Contrary, in meningioma only 10.71% samples lacked nuclear expression of NICD, while 71.43% had strong expression in more than half of nuclei in the field of view. The cytoplasmic expression of NICD was observed in all meningioma samples with strong expression in 69.64%, medium in 25% and low in 5.36%. The higher nuclear expression was accompanied with higher cytoplasmic expression ($p=0,002$).

Conclusion: Nuclear translocation of NICD in meningioma, which was absent in healthy brain tissue, suggests aberrant Notch signalling in intracranial meningioma.

Key words: Intracranial meningioma, NOTCH1 intracellular domain, Notch signalling pathway