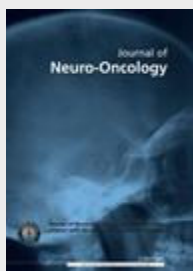



## Journal Article



## Quantitative PCR analysis of the expression profile of genes related to multiple drug resistance in tumors of the central nervous system

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### Abstract

**Objectives** To evaluate and compare the profile of expression of genes related to drug resistance in brain tumors and to analyze the impact of the increased expression of these genes on overall survival.

**Methods** Eighty microdissected brain tumor samples from 79 patients were analyzed by RQ-PCR for the genes *MDR1*, *MRP1*, *MRP3*, *LRP* and *BCRP*. Protein expression was assessed by immunohistochemistry for *MRP1* and *LRP* genes. Pediatric cases (0 to 20 years): 46 (17F:29M, median age  $7.3 \pm 5.9$  years); adult tumors: 33 (17F:16M, median age  $46.6 \pm 14.5$  years). Histological diagnoses: 21 astrocytomas I and II, 28 astrocytomas III and glioblastomas, 17 medulloblastomas, 8 ependymomas, and 6 oligodendrogliomas.

**Results** glial tumors expressed higher *MDR1* ( $P = 0.003$ ) and *BCRP* ( $P = 0.03$ ) levels than embryonic tumors. Low-grade astrocytomas expressed high *MDR1* ( $P = 0.001$ ), *MRP3* ( $P = 0.01$ ) and *LRP* ( $P = 0.02$ ) levels. The *MRP1* gene was preferentially expressed by medulloblastomas ( $P = 0.04$ ) and ependymomas ( $P = 0.04$ ); ependymomas also presented an increase of *LRP* ( $P = 0.02$ ). The mRNA levels of *MRP1* and *LRP* genes were associated to protein expression. The profile of gene expression of primary pilocytic astrocytomas of the hypothalamus and of the other locations was similar. Increased expression of resistance genes, separately or jointly, was not correlated with shorter overall survival in patients with medulloblastomas/PNET and

malignant gliomas.

*Conclusions* Drug resistance genes do not explain the higher sensitivity of gliomas of the hypothalamus/pituitary/optic pathways to chemotherapy. The increased expression of resistance genes had no impact on the overall survival of patients with medulloblastomas/PNET and high grade gliomas. High *MDR1*, *MRP3* and *LRP* levels may be implicated in the primary resistance of pilocytic astrocytomas to chemotherapy.

**Keywords** Cancer - Brain tumor - Drug resistance - Chemotherapy

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