Nuclear survivin expression predicts poorer prognosis in glioblastoma

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Abstract Survivin is a member of the inhibitor of apoptosis family, and is expressed in various malignant tumors. Survivin overexpression has been reported to be a poorer prognostic factor in various malignancies. However, the prognostic value of survivin expression in patients with glioblastoma is still controversial. Therefore, in this study the role of survivin as a predictor for survival was investigated in patients with glioblastoma. Tissue specimens were obtained from 66 patients with glioblastoma treated with radiotherapy. Survivin expression was detected by an immunohistochemical method. Nuclear and cytoplasm survivin scores were defined by using the cell positivity and staining intensity. The scores were defined as follows, 0 (no staining), 1 (less than 50% of cell positivity and any staining), 2 (more than 50% of cell positivity and weak to moderate intensity) and 3 (more than 50% of cell positivity and strong intensity). The correlation between survivin scores and the overall survival rate was evaluated. Nuclear and cytoplasm survivin staining were noted in 47 and 58 patients, respectively. The number of patients with nuclear survivin score of 0, 1, 2 and 3, were 19 (28.8%), 26 (39.4%), 9 (13.6%) and 12 (18.2%), respectively. The 3-year overall survival rate of the nuclear survivin score 3 was 0%, significantly lower than the 11.6% of the nuclear survivin score 2 ($P = 0.0003$). Cytoplasm survivin score did not correlate with the prognosis. Nuclear survivin expression may be a useful biomarker for predicting prognosis in patients with glioblastoma.

Keywords Survivin · Glioblastoma · Radiotherapy · Nuclear · Cytoplasm

Introduction

Glioblastoma, the most malignant brain tumor in adults, is highly resistant to radiotherapy and chemotherapy. The recent standard treatments of this disease are considered to be surgical resection to the extent feasible, followed by radiotherapy and chemotherapy including temozolomide. The median survival time of the patients with glioblastoma has remained approximately 12 months over the last few decades, even though multimodal therapies have been applied.

Survivin is 16.5-kDa protein and a member of the inhibitors of apoptosis family. It is expressed in fetal tissues...