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Vascularized head and neck tumors and growth factors: immunohistochemical and rt-pcr profile in pediatric age

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Brain tumors account approximately for 20% of all childhood cancers and are characterized by a large diversity of morphological entities. The formation of abnormal, dysfunctional tumor vasculature and glioblastoma stem-like cells (GSCs) are believed to be the major components of the difficulty to treat these tumors effectively. Massive formation of blood vessels is one of the most important histological elements to determine the progression and histological grading of tumors. We hypothesized that an increased expression of TGF-β1 in tumor cells stimulates tumor neo-vascularization by mediating the secretion of relevant angiogenic factors via an autocrine mechanism. Expression of TGF-β in relation to VEGF and VEGF-receptors involved in angiogenesis and inflammation pathways was evaluated in pediatric patients with brain tumors and compared with normal tissues. Our results demonstrated that TGF-β1, VEGF-A and VEGF-RII were significantly related to the development and to the growth of glioblastoma. We can speculate that TGF-β1 and VEGF are involved in the cascade of the malignant progression of glioblastoma. These factors promote tumorigenesis and malignant progression of glioblastoma by a mechanism determining anti-apoptotic, angiogenetic and invasive behaviour of the tumor cells. Basing on our experimental data, we propose that VEGF may be the double promoter responsible not only for the tumor vessels, but also for the tumor stem cells [1]. Our data demonstrate that GSCs in association with high levels of VEGF-A and TGF-β play a key role in the development of the tumor vascularization acting on endothelial cells differentiation.

References

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