

EPIDERMAL GROWTH FACTOR RECEPTOR SERUM LEVELS AND PROGNOSTIC VALUE IN MALIGNANT GLIOMAS

Michele Quaranta¹, Rosa Divella¹, Antonella Daniele¹, Silvia Di Tardo¹, Maria Teresa Venneri¹, Ivan Lolli², and Giuseppe Troccoli²

¹Department of Experimental Oncology of Cancer Research, IRCCS "Istituto Tumori Giovanni Paolo II", Bari; ²Department of Medical Oncology of University of Bari, Bari, Italy

Aims and background: The epidermal growth factor receptor (EGFR) is a member of a family of cell membrane receptors that use tyrosine kinase activity as the signal transduction mechanism. It is commonly expressed or overexpressed by many solid tumors and correlates with disease progression and a poor clinical prognosis. Increased EGFR expression might therefore be a strong prognostic feature in multiple tumor types, and inhibition of its cellular actions may have substantial therapeutic benefit. The aim of this study was to estimate the EGFR serum concentration for potential use as a biological marker of brain cancer to predict prognosis and follow-up after treatment.

Methods and study design: Serum samples obtained from 50 healthy individuals and 65 brain cancer patients (35 glioblastoma multiforme and 30 anaplastic astrocytomas) were collected before and after treatment and assayed for EGFR extracellular domain serum concentrations by a sandwich ELISA.

Results: EGFR was elevated in 47 of 65 brain cancer patients,

with mean serum values of 84 ± 18 ng/ml, compared with that of healthy controls (43.6 ± 11 ng/ml, $P = 0.001$). There was a significant difference in the mean serum levels of EGFR between glioblastoma multiforme patients (96.2 ± 12 ng/ml) and anaplastic astrocytoma patients (71.6 ± 18 ng/ml, $P = 0.04$). Sixty brain cancer patients underwent surgery; EGFR serum levels did not show significant differences from those observed before surgery. For all patients, median overall survival was 13 months (anaplastic astrocytoma, 18 months; glioblastoma multiforme, 12.5 months). In 47 patients with high EGFR serum levels, overall survival was reduced ($P = 0.01$), with a median survival time corresponding to 11.5 months (anaplastic astrocytoma, 14.5 months; glioblastoma multiforme, 10.5 months).

Conclusions: Although a prospective study with large sample size is warranted, serum EGFR extracellular domain may be potentially useful as a biological marker of gliomas for prediction of prognosis and follow-up after treatment.

Key words: anaplastic astrocytoma, epidermal growth factor receptor, glioblastoma multiforme.