PRE-OPERATIVE CHEMOTHERAPY AS A NEW STRATEGY OF TREATMENT FOR LOW GRADE GLIOMAS IN ELOQUENT AREAS

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BACKGROUND: (blind field). METHODS: Patients with LGG after biopsy or partial resection at a previous surgery, who progressed with increasing seizures and/or radiologically, received 1 week on/1 week off temozolomide to a maximum of 12 cycles. Response on MRI-FLAIR images was evaluated every 3 months based on RANO and volumetric criteria. Changes on diffusion tensor imaging (DTI) were assessed by histogram analysis and Functional Diffusion Maps and compared with RANO and volumetric criteria, and response of seizures. RESULTS: 24 patients with an histological diagnosis of LGG according to WHO 2007 were enrolled from 2008 to 2013: 19/24 males, median age 32 years (range 23-56) and median KPS 90. Reasons for chemotherapy were either a large residual tumor in 15/24 (seizures in 13/15) or tumor progression in 9/24 (seizures in 3/9). Nineteen of 24 patients are evaluable so far for response, while 5 patients are still under treatment. Median number of cycles was 6 (range 4-12). Best response according to RANO was: MR in 3/19 (16%), SD in 14/19 (74%) and PD in 2/19 (10%). Among patients with response or stable disease according to RANO, tumor volume reduction on FLAIR images ranged between 4.3% and 42.7% (median: 26.6%). In all patients significant changes in diffusion patterns, suggestive of a reduced tumor infiltration, were observed after 3 cycles (p < 0.05) and became more significant (p < 0.01) after 6 cycles. Twelve out of 15 patients had a significant reduction of seizure frequency concurrent with significant changes on DTI despite a volumetric stability. Seventeen out of 19 patients underwent reoperation (most after 6 cycles of temozolomide); overall a near-total resection (≥95%) was achieved in 9/19 (47%) patients of the whole series. In 4 patients total resection was confirmed by the absence of IDH1 mutated cells in tumor margins. CONCLUSIONS: Preoperative chemotherapy in patients with LGG in “eloquent” areas can allow a total near-total resection at reoperation in a significant subset of patients. DTI changes may be an early signature for response and correlate with seizure response better than conventional MRI. Moreover, DTI could improve the evaluation of feasibility and timing of reoperation.

SECONDARY CATEGORY: n/a.