O7.04. DCE-MRI DISCRIMINATES BETWEEN RESPONDER AND NON-RESPONDER IN RECURRENT HIGH-GRADE GLIOMA PATIENTS UNDERGOING ANTI-ANGIOGENIC TREATMENT

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OBJECTIVES: In this prospective phase II clinical study we analyzed whether dynamic contrast enhanced (DCE) MRI is able to distinguish between anti-vascular and anti-tumor effects in the course of anti-angiogenic treatment of recurrent high-grade glioma patients (rHGG). METHODS: Twenty-two patients with rHGG (16 glioblastoma, 5 anaplastic astrocytoma, 1 anaplastic oligoastrocytoma) were treated biweekly with bevacizumab/irinotecan. DCE-MRI scans were performed prior to (baseline) and eight weeks after treatment commencement. DCE-MRI analysis included four semi-quantitative parameters, describing gadolinium contrast medium behavior: 1) initial slope of signal increase (marker for vessel permeability; slope), 2) maximum enhancement (marker for extravascular volume; ME), 3) time from starting of curve increase until ME (time-to-peak; TTP), 4) area under the curve until ME (AUC). Comparison of DCE parameters at baseline and follow-up was performed by Wilcoxon rank test. Responders to anti-angiogenic therapy were defined as having a progression free survival greater than 6 months. RESULTS: Mean PFS was 4.0 ± 2.2 months and 4 patients had a PFS greater than 6 months. At baseline there was no difference in ME, TTP, AUC and slope between responder and non-responder. At follow-up responders showed a significant decrease in ME, TTP and AUC, whereas slope did not change (mean ME 60.03% vs. 23.00%, mean TTP 579.5 sec vs 367.4 sec, mean AUC 55,040 vs 12,150, p < 0.001, respectively, slope 1.03 vs 1.04). In contrary, non-responder showed no change in ME, TTP and AUC but an increase in slope (mean ME 55.45% vs. 50.21%, mean TTP 539.0 sec vs. 523.4 sec, mean AUC 53,440 vs. 50,320 and slope 1.49 vs 1.74, p < 0.001). CONCLUSION: Semiquantitative DCE-MRI analysis may identify responders to anti-angiogenic therapy characterized by a significant decrease in extravascular volume despite lack of reduction in vascular permeability. These results may provide insights into anti-angiogenic treatment effects and serve as a new imaging biomarker in rHGG patients undergoing bevacizumab therapy.