NI-62. DCE-MRI DISCRIMINATES BETWEEN RESPONDER AND NON-RESPONDER IN PROGRESSIVE HIGH GRADE GLIOMA PATIENTS UNDERGOING ANTI-ANGIOGENIC TREATMENT

Martha Nowosielski1, Christian Kremser3, Michael Schocke3, Elke Gizewski3, Sarah Iglseder1, Armin Muigg1, Christian Freyschlag1, Günter Stockhammer1, and Markus Hutterer1,2; 1Innsbruck Medical University, Department for Neurology, Innsbruck, Austria; 2University of Regensburg, Department for Neurology, Regensburg, Germany; 3Innsbruck Medical University, Department for Radiology, Innsbruck, Austria; 4Innsbruck Medical University, Department for Neurosurgery, Innsbruck, Austria

OBJECTIVES: In this prospective phase II clinical study we analyzed whether dynamic contrast enhanced (DCE) - MRI may distinguish between anti-vascular and anti-tumor effects in the course of anti-angiogenic treatment of progressive high-grade glioma patients (pHGG). METHODS: Twenty-two patients with pHGG (16 glioblastoma, 5 anaplastic astrocytoma WHO III, 1 anaplastic oligoastrocytoma) were treated biweekly with bevacizumab/irinotecan. DCE-MRI scans were performed at baseline and eight weeks after treatment commencement. DCE-MRI analysis included four semiquantitative 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 (IAUC). Responders to anti-angiogenic therapy were defined as having a progression free survival (PFS) greater than six months (PFS6). DCE-MRI parameters were compared to PFS6 by Wilcoxon rank test. RESULTS: Mean PFS was 4.0 ± 2.2 months and 4 patients showed a PFS greater than 6 months and were classified as responders. At baseline there was no difference in ME, TTP, IAUC and slope between responder and non-responder. At follow-up responders showed a significant decrease in ME, TTP and IAUC, whereas slope did not change (mean ME 60.03% vs. 23.0%, mean TTP 579.5sec vs 367.4sec, mean IAUC 55040 vs 12150 and slope 1.03 vs 1.04, p ≤ 0.001). In contrary non-responder did not show a change in ME, TTP and IAUC but an increase in slope (mean ME 55.45% vs 50.21%, mean sTTP 539.0sec vs 523.4sec, mean IAUC 53440 vs 50320 and slope 1.49 vs 1.74, p < 0.001). CONCLUSION: By semiquantitative DCE-MRI analysis we could show that responders to anti-angiogenic therapy show a significant decrease in extravascular volume despite no decrease in vascular permeability. These results might provide insights into anti-angiogenic treatment effects in responding patients.