IB-02. ROLE OF TUMOR INFILTRATING LYMPHOCYTES AND PDL1 EXPRESSION IN GLIOBLASTOMA (GBM) AND BRAIN METASTASES (BM): COMPARATIVE ANALYSIS

Anna Sophie Berghoff1,2, Barbara Kiesel3,4, Georg Widhalm3,4, Orsolya Rajkó2,3, Gerda Ricken1,3, Adelheid Wöhler1,3, Felicitas Oberndorfer2, Karl Dieckmann3,6, Martin Filipits2,3, Christine Marosi2,3, Christoph Höller7, Wolfgang Wick8, and Matthias Preusser2,3; 1Institute of Neurology, Medical University of Vienna, Vienna, Austria; 2Department of Medicine I, Medical University of Vienna, Vienna, Austria; 3Comprehensive Cancer Center, Medical University of Vienna, Vienna, Austria; 4Department of Neurosurgery, Medical University of Vienna, Vienna, Austria; 5Institute of Clinical Pathology, Medical University of Vienna, Vienna, Austria; 6Department of Radiotherapy, Medical University of Vienna, Vienna, Austria; 7Department of Dermatology, Medical University of Vienna, Vienna, Austria; 8Neurology Clinic and National Center for Tumor Disease, University of Heidelberg, Heidelberg, Germany

BACKGROUND: Differences in the adaptive immune response to various kinds of brain tumors have been poorly characterized. METHODS: We immunostained 287 neurosurgical specimens: 170 BM (lung cancer: 77 (45.3%); breast cancer: 17 (10.0%); melanoma 44 (25.9%); renal cell carcinoma 10 (5.9%) others 22 (7.7%)) and 117 GBM for CD3 (n = 287), CD8 (n = 287), PD1 (n = 287) and PDL1 (n = 234) and used previously published semiquantitative evaluation criteria. RESULTS: TIL infiltration of variable density (sparse to dense) was found in 161/170 (94.7%) BM and 78/117 (66.6%) GBM. TILs were predominantly present in the tumor stroma and perivascular areas in BM and in perivascular area in GBM. Dense infiltration with CD3+ TILs (p < 0.001), CD8+ TILs (p < 0.001) and PD1+ TILs (p < 0.001) was observed more frequently in BM than GBM. Among BM, we found significant differences in the composition of immune infiltrates with renal cell carcinoma BM showing the highest density of CD3+ and PD1+ TILs. Membranous PDL1 expression on tumor cells was evident in 25/117 (21.4%) BM and 44/117 (37.6%) GBM. Expression of PDL1 in over 5% of tumor cells was more frequently observed in GBM than in BM (p = 0.006). Dense infiltration of CD3+ TILs (9 vs. 12 months; p = 0.015) correlated with favorable survival prognosis in BM patients, while no prognostic impact of TIL infiltration was evident in GBM. Expression of PDL1 in over 5% of tumor cells was not associated with survival prognosis in BM (11 vs. 11 months; p = 0.395) or GBM (15 vs. 14 months; p = 0.859). CONCLUSION: We found high TIL densities and prognostic impact of CD3+ immune infiltrates in BM. GBM was characterized by sparse TIL infiltrates, higher expression of PDL1 and lack of prognostic impact of immune infiltrates. Our results indicate clinically relevant differences in the immune response to brain tumor types and may be of interest for studies with immunomodulatory agents.