NEURO-ONCOLOGY

Abstracts

PRE-CLINICAL MODELS

PCM-01. DIFFERENTIAL RESPONSES OF MURINE MODELS OF SUPRATENTORIAL EPENDYMOMA TO GEMCITABINE AS MEASURED BY MRI AND PET-CT

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CENTRAL HYPOTHESIS: Mouse and human ependymomas have similar imaging characteristics. Therefore, preclinical MRI and PET in mice harboring ependymoma can help identify imaging correlates of differential drug response for application to future human clinical trials. METHODS: 7-T MRI was performed on two murine models of supratentorial ependymoma, one RELA-fusion negative, the other fusion positive, treated with gemcitabine 0.805 mg/m²/min fixed dose rate infusion for 3 hours (equivalent pediatric dose 10 mg/m²/min) and compared to untreated controls. Tumor growth was measured volumetrically on MRI and correlated with tumor bioluminescence. Mice were anesthetized using isofluorane during acquisition of T2-weighted sagittal, transverse and coronal; diffusion-weighted (DW); and susceptibility-weighted images (SWI). Single-position, whole-body PET imaging was performed 10 minutes post injection of [¹¹C]methionine, retro-orbitally, on fusion positive tumors. PET and CT images were co-registered using Inveon Research Workspace software with manual optimization. The reading neuro-radiologist and neuro-oncologist were blinded as to treated mice and untreated controls. RESULTS: Both models responded to gemcitabine compared to untreated control mice with supratentorial ependymoma as evidenced by bioluminescence, volumetric measurement on T2-weighted MRI, and qualitative evaluation of DWI and SWI; RELA-fusion positive disease was notably more responsive. This response was further supported by a decrease in [¹¹C]methionine uptake in the RELA positive murine model treated with gemcitabine. CONCLUSIONS: Both MRI and bioluminescence confirmed differential responses of RELA-fusion positive and negative murine models of ependymoma to gemcitabine. PET may provide an additional imaging correlate for translation to human clinical trials.

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