Abstract:

Aim/Introduction: Several molecular imaging tracers and MRI techniques are available for differentiating radiation necrosis from residual/recurrent gliomas. We aimed to explore the utility of post-therapy 99mTc-methoxyisobutylisonitrile (MIBI) brain SPECT/CT and multiparametric MRI (mpMRI) in patients with glioma. Methods: Patients with pathologically or radiologically documented glioma were prospectively recruited for this study. 99mTc-MIBI brain SPECT/CT scanning was acquired 1 h. after i.v. injection of 666–925 MBq of the tracer. Quantitation of activity within lesions was performed using isocontour threshold of 70% of the maximum pixel. mpMRI was performed on a 1.5 Tesla MRI machine within a median of two weeks from MIBI SPECT/CT study for a subset of patients. Techniques included perfusion, with calculation of relative mean transit time and relative cerebral blood volume (rCBV), spectroscopy, with calculation of choline NAA ratio, and diffusion, with calculation of mean apparent diffusion coefficient (ADC). Qualitatively, the readings from both modalities were reported on a 5-point probability score as (1= definitely negative or benign changes, 2= probably negative or benign changes, 3=equivocal findings, 4= probably positive for residual/recurrent disease, 5= definitely positive for residual/recurrent disease malignant. For analysis, scores≥3 were considered positive.

Results: Thirty-five non-consecutive patients; (25 male, 10 female; mean age 43.5±16.4, 86% of them high grade glioma) were enrolled in this study. 8/21 patients who were scored positive on MIBI SPECT died by the time of analysis, compared to only 1/14 scored negative (p=0.056). Isocontour volume varied significantly according to pathologic grade (low-grade: 1±1.4 vs. 2.64±2.42 for high-grade, p=0.039) and was significantly higher in patients who later died compared to those who were still alive (1.92±1.85 vs. 3.79±3.17, p=0.038 ). 13/35 patients underwent mpMRI. Isocontour volume from MIBI SPECT shows marginal positive correlation with Choline NAA ratio (r=0.872, p=0.054) . Both MIBI SPECT/CT and mpMRI agreed on categorizing 4 benign and 7 malignant lesions. Two patients showed positive findings on MIBI while they were negative on mpMRI. The two patients European Association of Nuclear Medicine Schmalzhofgasse 26, 1060 Vienna, Austria Phone +43-(0)1 890 44 27, Fax +43(0)1 890 44 27/9 Email: abstracts@eanm.org demonstrated increasing uptake on subsequent follow-up MIBI scanning. One of them progressed rapidly and died on disease. 19/35 patients had at least one follow-up MIBI SPECT/CT. Among the 19, 3/8 patients with negative findings demonstrated positive uptake on subsequent scans while the remaining 11 who were scored positive continued to show uptake impressive of residual/recurrent disease e. Conclusion: In patients with glioma, post-therapy brain SPECT/CT with 99mTc-MIBI can provide useful diagnostic and prognostic information, that may complement the results from mpMRI. References: none

Published In:

EANM 2019, NULL, NULL