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[¹⁷⁷Lu]Lu-PSMA Therapy as an Individual Treatment Approach for Patients with High-Grade Glioma: Dosimetry Results and Critical Statement

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Abstract

The theranostic use of prostate-specific membrane antigen (PSMA) appears to be promising in patients with high-grade glioma. This study investigated [¹⁷⁷Lu]Lu-PSMA therapy as an individual treatment approach with a focus on intratherapeutic dosimetry. **Methods:** Three patients were treated with a median of 6.03 GBq (interquartile range [IQR], 5.74-6.10) of [¹⁷⁷Lu]Lu-PSMA. Intratherapeutic dosimetry was performed using a hybrid scenario with planar whole-body scintigraphy at 2, 24, and 48 h after treatment injection and SPECT/CT at 48 h after injection. Additive whole-body scintigraphy at 8 d after injection was performed on 1 patient. **Results:** The median doses were 0.56 Gy (IQR, 0.36-1.25 Gy) to tumor, 0.27 Gy (IQR, 0.16-0.57 Gy) to risk organs, 2.13 Gy (IQR, 1.55-2.89 Gy) to kidneys, and 0.76 Gy (IQR, 0.70-1.20 Gy) to salivary glands. Whole-body exposure was 0.11 Gy (IQR, 0.06-0.18 Gy). **Conclusion:** Because the intratherapeutic tumor dose is lower than that used in external radiation oncology, the effectiveness of treatment is questionable.

Keywords: PET/MRI; [¹⁷⁷Lu]Lu-PSMA; [⁶⁸Ga]Ga-PSMA; glioma; theranostics.

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