Peptide Receptor Radionuclide Therapy (PRRT) for Metastatic Neuroendocrine Tumors (NETs): A United States Experience

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Background: The phase III NETTER-1 trial showed that PRRT serves as effective therapy for low to intermediate grade progressive metastatic small bowel NETs but little is known about its general utility in real-world United States (US) practice. We therefore examined the efficacy and toxicity of PRRT in a US-based population.

Methods: Data was analyzed on all University of Pennsylvania patients with metastatic NETs who underwent PRRT therapy for progressive disease between July 2005 and March 2016 (n=24). Tumor progression was determined by RECIST 1.1. Laboratory and clinical data was analyzed using CTCAE criteria, to determine hematologic toxicity, nephrotoxicity, and hepatotoxicity. Kaplan-Meier plots were created to estimate progression free survival (PFS) and overall survival (OS).

Results: Mean age, duration of disease and number of prior therapies at first PRRT was 58 years, 5 years, and 2.6 treatments, respectively. 58% were male, 29% had small bowel primary tumors and 29% had grade 3 tumors. During follow-up (range 3-129 months), 17 of 24 patients (71%) progressed, 5 (21%) had stable disease, 2 (8%) have not yet obtained post-treatment imaging, and there were 11 deaths. Median PFS was 13 months and median OS was 36 months. New onset nephrotoxicity, anemia, leukopenia, and thrombocytopenia developed in 36%, 50%, 30%, and 28%, respectively. Acute liver injury occurred in 11 patients (46%) including 5 (21%) with biochemical injury, 11 (46%) with new onset ascites, and 3 (13%) deaths due to liver-related complications.

Conclusion: In this US population of metastatic NETs, PRRT provided a median PFS of 13 months. The PRRT-associated toxicities and lower PFS compared to the NETTER-1 trial may be due to extensive pre-treatment, higher grade tumors, inclusion of non-small bowel primary sites, and later use of PRRT, all of which may have implications regarding where PRRT should fit in the treatment algorithm of NET patients.

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