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Re-Treatment with ^{177}Lu -DOTATATE in Patients With Neuroendocrine Tumors: Multicenter Real-World Experience



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BACKGROUND: Re-treatment peptide receptor radionuclide therapy (R-PRRT) with ^{177}Lu -DOTATATE may prolong survival in patients with neuroendocrine tumors (NETs) who have already responded to initial PRRT (I-PRRT).

METHODS: This retrospective analysis aimed to evaluate the safety and efficacy of R-PRRT with ^{177}Lu -DOTATATE (2 extra cycles; total 400 mCi \pm 10%) in patients at three independent sites: Erasmus Medical Center (EMC), Royal Free Hospital (RFH) and Universitätsklinikum Bonn (UKB). Patients had progressive somatostatin receptor-positive NETs and \geq 18 months' progression-free survival (PFS) after I-PRRT with ^{177}Lu -DOTATATE (3–4 cycles; total 800 mCi \pm 10%).

RESULTS: In the efficacy set, 65% of patients had pancreatic or midgut NETs (N=224). At I-PRRT baseline, median age was 59, 63 and 62 years (overall range, 32–85) at EMC, RFH and UKB, respectively; 28%, 65% and 60% had bone lesions and 91%, 96% and 97% had liver lesions. Other baseline characteristics were broadly similar across sites. After R-PRRT, transient grade 3 bone marrow toxicity occurred in 18/237 patients (8%) and grade 4 in 3/237 (1%) in the safety set, similar to rates after I-PRRT. The incidence of myelodysplastic syndrome or acute myeloid leukemia per 100 person-years was 0.243 (95% confidence interval [CI]: 0.066, 0.622).

CONCLUSION: The short-term hematological safety profile of R-PRRT was similar to that of I-PRRT, and long-term myeloproliferative toxicity remained within the expected range. The PFS following R-PRRT with two extra cycles suggests an appreciable survival benefit in patients with disease progression after I-PRRT with ¹⁷⁷Lu-DOTATATE.

PFS after R-PRRT

Median (95% CI)	Follow-up, months	PFS, months
EMC (n = 168)	30.4 (22.5, 38.4)	14.6 (12.4, 16.9)
RFH (n = 26)	15.4 (5.7–42.7)*	17.5 (12.4, 22.6)
UKB (n = 30)	26.7 (17.8, 31.0)	22.9 (17.4, 33.4)
Meta-analysis (N = 224)	–	16.7 (14.5, 18.6)

*Range

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