C-39

Repeat Peptide Receptor Radionuclide Therapy in Neuroendocrine Neoplasms: A NET Center of Excellence Experience

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BACKGROUND

Lu177 DOTATATE Peptide Receptor Radionucleotide Therapy (PRRT) was FDA approved in the United States in 2018, however, the data for the safety and efficacy of repeat PRRT are almost exclusively from European centers. We present an updated experience with repeat PRRT in a cohort of US patients.

METHODS

We used our single-center longitudinal IRB approved neuroendocrine tumor (NET) registry to identify patients who had been previously treated with at least 1 dose of PRRT (PRRT 1, either Lu 177 DOTATATE or Y90 DOTATOC) and following disease progression were retreated with a second course of PRRT (PRRT 2). Patients who received alpha PRRT were not included.

RESULTS

A total of 153 patients received Lu-177 DOTATATE PRRT at our institution, out of which, 13/153 (8.5%) patients received repeat PRRT. 2/13 patients were excluded due to lack of follow up. All patients included were White (11/11, 100%). Median age of the participants was 65 years (IQR 63, 67) and 54.5% (6/11) patients were females. Most patients had grade 2 (9/11,81.8%) followed by grade 1 NET (2/11, 18.2%) and all except one patient included had a gastroenteropancreatic origin NET (10,11, 90.9%). 45.5% (5/11) patients received Lu-177 DOTATE PRRT only both for PRRT1 and PRRT 2, while 54.5% (6/11) patients received Y90 DOTATOC PRRT for PRRT1. Median number of lines of therapies before PRRT1 and PRRT2 were 2 (IQR 2,5) and 1 (IQR 1,2) respectively. Patients received a median of 3 (IQR 2, 4) and 3 (IQR 1,4) cycles for PRRT1 and PRRT2 respectively. At first restaging scan after PRRT1 (3-6 months), 54.5% and 45.5% patients had partial response (PR) and stable disease (SD) respectively. At first restaging scan after PRRT2 (3-6 months), 45.5%, 27.3% and 9.1% patients had SD, progressive disease (PD) and PR respectively; 2/11 patients (18.2%) died before first restaging scan. Median PFS for PRRT1 (n=11) was 22.5 months (IQR 12.7, 30.7). Median PFS (n=5) for PRRT2 was 10.9 months (IQR 10.05, 25.7). PFS was not reached for 1 patient after PRRT2. 1 (9.1%) patient each developed grade 2 nephrotoxicity and grade 3 thrombocytopenia after PRRT2.

CONCLUSIONS

To our knowledge, this is the first of its kind analysis describing the safety and effectiveness of repeat PRRT in a US cohort. We show that repeat PRRT may benefit select patients and has an acceptable safety profile. Larger prospective clinical studies are required to identify patient groups that are more likely to benefit from repeat PRRT.