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Initial Experience with Peptide Receptor Radionuclide Therapy (PRRT) for the Treatment of Neuroendocrine Tumors (NETS) at a Tertiary Care United States Center

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BACKGROUND: The recent NETTER-1 trial showed that PRRT is effective for treating mid-gut NETs, leading to FDA approval of Lutetium 177 DOTATATE for the treatment of gastroenteropancreatic NETs. The purpose of this study was to examine the implementation of PRRT at a tertiary referral center by characterizing the patients selected for treatment, tolerance of therapy, and early toxicity.

METHODS: Medical records of all NET patients receiving PRRT from August 2018 through April 2019 were reviewed to obtain demographic data, tumor characteristics, prior non-PRRT NET treatments, adverse events, and laboratory values prior to and following PRRT. PRRT was administered according to the NETTER-1 protocol every 8 weeks.

RESULTS: 51 patients (24 female) were scheduled for PRRT over the study period. Mean (±SD) age and duration of disease prior to therapy were 60.1 ± 10.9 and 6.3 ± 5.2 years, respectively. Primary NET location was small bowel (45%), pancreas (27%), unknown (8%), colon (8%), lung (4%), and other (8%). NET grade was 1 in 34%, 2 in 53%, 3 in 13%, and unknown in 8%. 50 patients (98%) had received somatostatin analogue (SSA) therapy, and 37 (73%) had

undergone primary tumor resection. 33 patients (65%) had received non-SSA systemic therapy, including capecitabine/temozolomide (20 patients, 39%). 28 patients (55%) had received liver directed therapy (TACE, TARE, bland embolization, RFA, and/or wedge resection). Of the 51 scheduled patients, 39 received at least one dose of PRRT during the study period. Two of 86 cycles of PRRT (2%) were delayed due to fatigue and nausea, and 4 (5%) were delayed due to thrombocytopenia (Table 1). Table 1: Transient Toxicities Noted Over Study Period Toxicity Criteria (CTCAE Grade ≥ 2) Number of patients (N = 39) Leukopenia WBC < 3.0 thousand/μL 9 (no delayed treatment) Anemia Hgb < 10 g/dL 6 (no delayed treatment) Thrombocytopenia Platelets < 75 thousand/μL 4 (4 delayed treatment) Nephrotoxicity eGFR < 60 ml/min 7 (no delayed treatment) Hyperbilirubinemia Bilirubin (total) > 1.5xULN 5 (no delayed treatment) Transaminitis AST > 3xULN or ALT > 3xULN 0 (no delayed treatment)

CONCLUSION: Our early experience with PRRT in heavily pretreated, predominantly grade 2 patients including 4 with off label primary tumor locations only revealed transient toxicities in a minority of patients with few cases of treatment delay.