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Efficacy and Safety of Peptide Receptor Radionuclide Therapy in Lung Neuroendocrine Tumors: A Multicentre Study

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BACKGROUND: This study aimed to assess the outcome of lung carcinoid patients who received peptide receptor radionuclide therapy (PRRT).

METHODS: This is a retrospective review of patients with typical carcinoid (TC) and atypical carcinoid (AC), treated with PRRT at 2 ENETS Centres of Excellence. ^{68}Ga-DOTATATE PET/CT (GaTATE) and morphological imaging (RECIST 1.1 criteria) response were assessed at 3 months post-PRRT. Treatment-related adverse events (AEs) were assessed during and post-PRRT. Overall survival (OS) was estimated by Kaplan-Meier analysis from the start of PRRT.

RESULTS: Of 51 patients (median age, 63 years, 16 female), 90% had AC and 10% TC. All patients had SSR uptake above the liver (94% modified Krenning 4). Most patients (94%) were treated due to disease progression and received a median 4 (range 1-4) cycles of ^{177}Lu-DOTATATE with the median cumulative activity of 27GBq (range 6-43GBq), of which 35% with concurrent radiosensitizing chemotherapy.

At a median follow-up of 41.8 months, the OS was 56 months (95% CI 50-not reached [NR]). Of 41 patients with available GaTATE, disease control rate (DCR) was 88% (46% partial response [PR] and 42% stable disease [SD]) and 12% had progressive disease (PD). Three patients had ^{111}In-octreotate scan, six patients were lost to follow-up and one died during treatment. Of 42 patients with RECIST-measurable disease, DCR was 90% (21% PR and 69% SD), and 10% had PD. Of patients with SD by RECIST, those with PR on GaTATEhad longer OS compared to those with no response, NR vs 58.7months (95% CI 30-NR), p 0.02. During induction and at 3 months the grade 3/4 AEs were as follows, thrombocytopaenia 2% and 0%, leukopenia 4% and 2%, lymphopenia 14%, and 2%, respectively. There were no long-term hematological or renal AEs.

CONCLUSION: PRRT is an effective treatment modality with an acceptable safety profile in patients with SSR-positive lung NETs.

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