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Treatment of High Grade Metastatic Neuroendocrine Tumor (mNET) with Peptide Receptor Radionuclide Therapy (PRRT) Retrospective Analysis in a Single Referral Center

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Background: The purpose of this study was to retrospectively evaluate the efficacy of PRRT with ^{111}In- Octreotide or ^{177}Lu-Octreotate in the treatment of high grade mNETS. Poorly differentiated high grade NETs are characterized by aggressive histologic features (high mitotic rate, extensive necrosis and nuclear atypia) and a poor prognosis. They are rarely express somatostatin receptors. Somatostatin receptor expression is seen in some of high grade NETs and this can be the basis of PRRT as a treatment modality to control this disease.

Methods: Based on chart review we selected a subgroup of patients with the diagnosis of somatostatin receptor positive high grade mNETs who were referred to our center for PRRT treatment. We used differentiation (poorly differentiated) or Ki67 index >20% (either one that was available). RECIST criteria were used to determine the status of disease at base line and last follow up at defined intervals and survival was calculated. Patients were treated up to maximum of 4 PRRT cycles. Biological response was assessed by calculating the median SUV change of 3 target lesions by comparing baseline and the last repeated PET scan SUVs and reported as percent.

Results: A total of 262 charts were reviewed and 17 patients were evaluable. Median age was 53 ranging from 37 to 70 years of age. Primary lesions were divided to pancreatic NET (PNET) n= 9 (53%), gastrointestinal NET n=4 (23%), pulmonary n=1 (6%), prostate cancer n=1 (6%) and unknown primary n=2 (12%). 7 patients (41%) had carcinoid syndrome, and among these patients 4 (57%) were PNET and 3 (43%) were gastrointestinal NET 59% (n=10) of patients received Lutetium and 41% (n=7) received Indium. During 12 months follow up 29% of patients had stable disease or partial response. Medium progression free survival was 12 months (Figure1). 6 patients had 30% SUV intensity reduction by PET/CT scan.

Conclusion: PRRT is a viable option for metastatic high grade NETs that express sandostatin receptors. The median progression free survival in our study is comparable to standard first line chemotherapy treatment. The efficacy of PRRT on the survival of the population studied is limited by small population size, patient selection and heterogeneity of origin of primary site.