C-20

Imaging, Clinical, and Safety Outcomes in Metastatic Neuroendocrine Tumor Patients Treated with Peptide Receptor Radionuclide Therapy in the Midwestern USA

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BACKGROUND

Multiple studies analyzing response to peptide receptor radionuclide therapy (PRRT) in metastatic neuroendocrine tumors (NETs) in the Australian and European populations have been published. However, data from US population is scant. This study, performed in a tertiary referral center in the Midwestern US, aims to assess the imaging, safety, and survival outcomes since the inception of this institution's PRRT program.

METHODS

This retrospective study included all consecutive metastatic NET patients treated with one or more doses of ^{177}Lu-Dotatate (Lutathera®) between March 2019 and April 2024, with a minimum follow-up period of 12 months. Primary endpoints included tumor response assessment using metabolic imaging tumor volume and RECIST v1.1, progression free survival (PFS), overall survival (OS), and safety profile. Secondary endpoints included analyzing trends of primary tumor location, metastatic sites, and tumor markers favoring disease progression.

RESULTS

A total of 42 patients [mean age (standard deviation), 66 + 5.6 years; 60% male; 88% Caucasians] including 27 (64.3%) gastrointestinal-NET, 13 (31%) pancreatic-NET, and 2 (4.8%) bronchial-NET patients were analyzed. 41 patients had WHO grade 1 or 2 NET (Ki-67<20%). Treatment response assessment at the end of follow-up period [median, 40 (27.5, 48) months] revealed partial response in 4 (9.5%), stable disease in 25 (59.5%), and disease progression in 13 (31%) patients, of which 12 patients died. The median progression-free and overall survivals were not reached at the end of follow-up period. 39 (92.6%) patients had grade 1 or 2 adverse effects. No treatment-related renal or liver dysfunction, myelodysplastic syndrome, or leukemia was reported. Transient lymphopenia and hyperglycemia were noted in 33 (78.6%) and 25 (59.5%) patients, respectively. Multivariable logistic regression analysis demonstrated no significant association of disease progression with primary or metastatic disease sites or pre-treatment Chromogranin A (CgA) levels. However, higher disease progression was noted in patients with grade 3 adverse effects (p=0.025) and higher post-treatment CgA levels (p=0.033).

Treatment cycles administered			
Four, n (%)	26 (61.9)	7 (16.7)	***0.006***
Three, n (%)	3 (7.1)	1 (2.4)	
Two, n (%)	0	3 (7.1)	
One, n (%)	0	2 (4.8)	
Common Terminology Criteria for Adverse Effects			
Grade 1 or 2	29 (100)	10 (76.9)	***0.025***
Grade 3	0	3 (23.1)	
Pre-treatment ChromograninA	107 (32,350)	360 (41,998)	0.305
Post-treatment ChromograninA	91.2 (46,232)	515 (148,1846)	***0.033***

CONCLUSIONS

The study supports the role of PRRT in favorable survival outcomes and safety profile in patients with metastatic NETs in a US-based population.

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