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Utility of 68Ga-DOTATATE for Grade 3, Poorly Differentiated Gastroenteropancreatic Neuroendocrine Carcinoma

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BACKGROUND

68Ga-DOTATATE is the preferred imaging modality for evaluating neuroendocrine tumor (NET) receptor status and metastatic disease. Poorly differentiated NETs, now referred to as neuroendocrine carcinoma (NEC), less frequently express SSTR, and typically have greater avidity on 18F-FDG-PET given the lack of SSTR. In this retrospective study, we examine the utility of 68Ga-DOTATATE for Grade 3, NEC.

METHODS

Thirty-four patients were diagnosed with Gastroenteropancreatic (GEP) NEC from 2012-2022. Radiographic imaging was ordered at the discretion of the treating physician. Patients with well-differentiated NETs were excluded. The imaging modalities used at the time of diagnosis and during surveillance were noted. When possible, the imaging findings on 68Ga-DOTATATE and 18F-FDG-PET were compared.

RESULTS

25 of the 34 primary tumors were pancreatic (73.5%), 5 were small bowel (14.7%), 2 were rectal (5.9%) and 2 were gastric (5.9%). Twenty patients (58.8%) had 18F-FDG-PET as their initial staging functional imaging modality while 7 patients (20.6%) had a 68Ga-DOTATATE. Six patients had both 68Ga-DOTATATE and 18F-FDG-PET either at the time of diagnosis or during surveillance. Of these 6 patients, 2 had newly identified bony metastasis and one had additional liver metastasis not seen on the 18F-FDG-PET. One of the two patients with bony metastasis had a Ki67 proliferation index < 3% with a mixed acinar carcinoma and one patient had small-cell type NEC with a Ki-67 proliferation index not reported. Nine of 20 patients (45%) had their imaging modality changed from 18F-FDG-PET to 68Ga-DOTATATE during the surveillance period. Of these nine patients, 68Ga-DOTATATE was ordered for three patients for localization of an unknown primary, three patients for preparation of octreotide or liver-directed therapy, and three patients for evaluation of disease progression and treatment response.

CONCLUSIONS

68Ga-DOTATATE PET may have superior sensitivity in detecting bony metastatic disease secondary to Gastroenteropancreatic NEC and can be used in combination with 18F-FDG-PET to further characterize suspicious lesions.

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