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Ga-DOTATATE Cardiac Uptake in Carcinoid Heart Disease Patients

Malak Itani¹; Manik Amin¹; Joyce Mhlanga¹; Nikolaos Trikalinos¹

¹Washington University in St Louis

BACKGROUND: Carcinoid heart disease (CHD) diagnosis and management relies on echocardiographic measurements and clinical symptoms. We explored the diagnostic utility of myocardial uptake of Ga-68 Dotatate in patients with neuroendocrine tumors (NETs) with and without CHD.

METHODS: We reviewed the Ga-68 Dotatate images of all NET patients with CHD who were seen in the clinic between 6/1/2016 (date of FDA approval of Ga-68 Dotatate) and 6/1/2019. For controls, we reviewed images of a second group of patients with carcinoid symptoms (CS) without CHD, and a third group of patients without CHD and with no CS. For semiquantitative evaluation of myocardial uptake of Ga-68 Dotatate, we placed regions of interest (ROI) with an area of 1 cm² over 5 regions in the myocardium (mid anterior wall, apical and mid lateral wall, mid and basal septal wall). For internal standardization, sum of mean standardized uptake value by body weight (SUV) over 5 myocardial regions was divided by SUV of the cardiac blood pool, and will be referred to as myocardial uptake score (MUS).

RESULTS: A total of 20 patients were included, all with well differentiated tumors (13 small bowel primary) with a mean age of 60 years (range 30 to 84). Twelve patients had carcinoid syndrome and 5 of these had carcinoid heart disease (group 1), while eight patients had no CHD or CS (group 3). Group 1 MUS was 10.9 (7.3 – 15, SD 2.8), Group 2 (CS with no CHD) was 7.7 (5.1 – 11.9, SD 2.2) and Group 3 was 8.7 (4.5 – 16, SD 4.1). Two patients in group 3 had elevated MUS (more than 10) and both had evidence of non-CHD cardiac disease.

CONCLUSION: Ga-Dotatate PET/CT myocardial uptake is higher in patients with CHD and non-carcinoid heart disease. This can aid identification of NET patients at risk for cardiac disease.

