Peptide Receptor Radionuclide Therapy in the Treatment of Neuroendocrine Tumors

Dik J. Kwekkeboom, MD, PhD*, Eric P. Krenning, MD, PhD

KEYWORDS

• Neuroendocrine tumor • Carcinoid • Radionuclide therapy • PRRT • Treatment

KEY POINTS

- Peptide receptor radionuclide therapy (PRRT) is a promising new treatment modality for inoperable or metastasized gastroenteropancreatic neuroendocrine tumors patients.
- Most studies report objective response rates in 15% to 35% of patients.
- Progression-free and overall survival compare favorably with that for somatostatin analogues, chemotherapy, or newer, "targeted" therapies.

INTRODUCTION

In patients with inoperable metastasized gastroenteropancreatic neuroendocrine tumors (GEPNETs), therapeutic options are limited. Treatment with somatostatin analogues decreases hormonal overproduction and can relieve symptoms in patients with GEPNETs.[1,2] Furthermore, more recent studies showed that treatment with somatostatin analogues prolongs progression-free survival (PFS) in patients with well-differentiated (grades 1 and 2) GEPNETs.[3,4]

The majority of GEPNETs express somatostatin receptors, mainly somatostatin receptor subtypes 2 and 5.[5] These can be visualized using radiolabeled somatostatin analogues. The first commercially available diagnostic somatostatin analogue was [^{111}Indium-DTPA^{0}]octreotide (Octreoscan; Mallinckrodt, St Louis, MO).[6] Nowadays, newer PET radiopharmaceuticals are available, such as [^{68}Ga-DOTA-Tyr^{3}]octreotide[7] and [^{68}Ga-DOTA-Tyr^{3}]octreotate.[8] A logical sequel to somatostatin receptor imaging for diagnostic purposes was to use the same receptor-binding concept for treatment (**Fig. 1**).

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Department of Nuclear Medicine, Erasmus MC, University Medical Center, s-Gravendijkwal 230, Rotterdam 3015CE, The Netherlands
* Corresponding author.
E-mail address: d.j.kwekkeboom@erasmusmc.nl

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