Neuroendocrine tumors (NETs) are comprised of biologically diverse neoplasms. The presence of systemic symptoms is dependent on NET location and differentiation. New treatment modalities have become available, offering patients improved symptom management and survival. Advanced practice RNs (APRNs) provide direct care to and coordination of treatment for patients with NETs, including treatment of somatostatin receptor–positive disease with lutetium Lu 177 dotatate (Lutathera®) peptide receptor radionuclide therapy.

AT A GLANCE

- NETs are complex and may cause a variety of symptoms, such as those associated with carcinoid syndrome.
- APRNs are key members of the interprofessional team and are involved in the diagnosis, treatment, and coordination of care of patients with NETs.
- Somatostatin receptor–positive NETs may be treated with targeted treatments containing radioactive isotopes, such as lutetium Lu 177 dotatate.

KEYWORDS
peptide receptor radionuclide therapy (PRRT); neuroendocrine; carcinoid syndrome

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Peptide Receptor Radionuclide Therapy

An emerging treatment for gastrointestinal neuroendocrine tumors

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Neuroendocrine tumors (NETs) are biologically diverse tumors comprised of neoplastic neuroendocrine cells. The function of normal neuroendocrine cells in the gastrointestinal tract is to secrete metabolically active substances, including hormones and additional substances that aid in digestion and other physiologic functions (Christopoulos & Papavassiliou, 2005). The secretory activity of neuroendocrine cells is stimulated by physiologic processes, including the hormone somatostatin (Bosquet et al., 2019; Mittra, 2018). NETs produce a range of symptoms dependent on tumor size and location, spread of disease, and amount of hormone hypersecretion from the tumor(s). In early stages, surgery with curative intent is considered. Once the disease has metastasized beyond the primary organ, goals of care become managing symptoms and controlling the spread of disease.

Advanced practice RNs (APRNs) are essential to the provision of care to and the management of symptoms of patients diagnosed with NETs. New targeted treatments using peptide receptor radionuclide therapy (PRRT) show promise in terms of response and improved quality of life (Mittra, 2018). PRRT uses radionuclides, either yttrium-90 or lutetium-177, which vary in their physical properties. PRRT using lutetium-177 allows for longer half-life, and this radionuclide emits y-rays that persist on imaging for several days, allowing verification of dosing targets. This article refers to PRRT using lutetium-177.

Background

Incidence of Neuroendocrine Carcinomas

The incidence of NETs has increased in the United States. In 1993, the overall incidence of NETs was 1 per 100,000, whereas in 2012, the incidence had risen to 6.98 per 100,000 (Dasari et al., 2017). This heightened rate of incidence can be attributed to advances in radiographic imaging and increased incidental findings in emergent and urgent care settings (Dasari et al., 2017; Sackstein et al., 2018). Gastrointestinal NETs comprise almost half of all newly diagnosed primary NETs (Sackstein et al., 2018). Almost one-fourth of all patients newly diagnosed with NETs present with metastatic disease (Oronsky et al., 2017).

Classification and Diagnosis

Historically, NETs were organized into three classifications: (a) foregut tumors arising from the respiratory system, thymus, stomach, duodenum, and pancreas; (b) midgut tumors arising from the small intestine, appendix, and right colon; and (c) hindgut tumors arising from the transverse colon, sigmoid, and rectum (Kaltsas et al., 2004; Williams & Sandler, 1963). This classification method