



General Review

Peptide receptor radionuclide therapy of gastroenteropancreatic neuroendocrine tumors (GEP-NETs): From literature to practice

Radiothérapie interne vectorisée par les peptides des tumeurs neuroendocrines gastro-entéro-pancréatiques (TNE-GEP) : des données de la littérature à la pratique

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Abstract

Well differentiated gastroenteropancreatic neuroendocrine tumors (GEP-NETs) are characterized by the overexpression of specific biomarkers, especially somatostatin receptors subtype 2. Somatostatin receptor scintigraphy and currently, positron emission tomography using ⁶⁸Ga-labeled-somatostatin analogs are considered the gold standard for functional imaging of GEP-NETs. They are complementary to CT scan and to MRI, for the staging and restaging of these tumors and are useful to select patients for peptide receptor radionuclide therapy (PRRT), in a theranostic approach. Somatostatin analogues, radiolabeled with the beta-emitting radionuclides lutetium-177 and yttrium-90, have been developed for PRRT of GEP-NETs. The efficacy of this treatment depends on the intensity of uptake on pre-therapeutic scan, the extent of hepatic involvement, and a preserved global health status. Toxicity, mainly hematologic and renal can be reduced by a rigorous selection of patients and co-infusion of amino-acids. PRRT became possible since 2013 in some specialized centers in France, by the way of clinical research programs and temporary authorization from the *Agence nationale de sécurité du médicament et des produits de santé* to use PRRT. This decision took place after the communication of preliminary results of the NETTER-1 study, which confirmed the efficacy of LUTATHERA[®] in the treatment of midgut NETs. A marketing authorization for this radiopharmaceutical is expected in France in 2017. This article reports the main data of the literature on the development of PRRT and its current use in France. It also reviews the indications and the side effects of the treatment, and presents the perspective of optimization of this promising therapeutic approach for the coming years. The other therapeutic options in GEP-NETs are also presented.

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