

# Detection of somatostatin receptor subtypes 2 and 5 by somatostatin receptor scintigraphy and immunohistochemistry: clinical implications in the diagnostic and therapeutic management of gastroenteropancreatic neuroendocrine tumors

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## ABSTRACT

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**Aims and background.** Somatostatin receptor scintigraphy (SRS) is the standard method for the detection of somatostatin receptors (SSTRs). It is commonly used in gastroenteropancreatic neuroendocrine tumor (GEP-NET) staging, and represents the criterion of choice for treatment with somatostatin (SST) analogs. Immunohistochemistry (IHC) was reported as a reliable method for the detection of SSTRs with theoretically superior sensitivity over SRS.

**Methods and study design.** We retrospectively analyzed the sensitivity and specificity of IHC in the detection of SSTRs in a cohort of consecutive patients with GEP-NETs attending our Institute from 1997 to 2007. IHC analysis was restricted to SSTR2 and SSTR5, and the results were interpreted according to two different scoring systems. SRS was used as the gold standard.

**Results.** Forty-four patients were enrolled; 24 (55%) had foregut carcinoids, 9 (20%) midgut carcinoids, 2 (5%) hindgut carcinoids, and 9 (20%) had GEP-NETs of unknown primary sites. A high concordance rate between IHC and SRS was shown, irrespective of the IHC scoring system applied (73% and 70%). The sensitivity of IHC was 89.3% and 78.6% and the specificity 43.8% and 50%, depending on the scoring system used.

**Conclusions.** Although SSTR2 was shown to be expressed by IHC in up to 50% of tumors not visualized by SRS, SRS still remains the method of choice in the diagnostic and therapeutic management of GEP-NETs. More pathological and clinical data are needed to properly understand the clinical relevance of immunohistochemical detection of SSTR expression in the absence of tumor uptake at SRS.

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**Key words:** somatostatin receptors, neuroendocrine tumors, somatostatin receptor scintigraphy, immunohistochemistry.

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