

**Prevalence of Functional Tumors in Neuroendocrine Carcinoma:
An Analysis from the NCCN NET Database**

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Background: Neuroendocrine tumors (NETs) are increasing in incidence and prevalence. Identification and treatment of specific clinical NET syndromes are established, yet uncertainty exists regarding the prevalence of NET with hormone-related symptoms versus nonfunctional tumors.

Methods: The National Comprehensive Cancer Network (NCCN) Outcomes Database was queried to identify carcinoid, pancreatic NET (pNET), NET not otherwise specified (NOS), and adrenal cortical carcinoma/pheochromocytoma/paraganglioma (adrenal) patients presenting to 7 NCCN institutions in 2004-2010. This analysis describes demographic and clinical characteristics of NET patients by functional status at diagnosis.

Results: Among 1497 NET patients, 28% had a functional tumor. Carcinoid syndrome (CS) occurred in 30% of carcinoid patients and 25% of NOS patients, Prevalence of hormonal syndrome (HS) was 23% among pNET patients and 33% among adrenal patients. Among patients with distant disease at diagnosis, 45% of carcinoid patients, 42% of adrenal patients, and 26% of pNET and NOS patients had functional tumors. 15% of carcinoid patients with local/regional disease had CS, most often occurring in the small bowel. Among carcinoid patients with elevated 5-HIAA (n=200), 58% had functional tumors. The majority of functional pNET had an unspecified sub-type, with insulinoma (21%) and gastrinoma (19%) also prevalent. The most common symptoms at diagnosis among functional patients included changed bowel habits, weight loss, abdominal cramping, and nausea. Most patients (84%) with functional tumors and distant disease had metastatic disease in the liver at diagnosis (carcinoid: 84%, pNET: 88%, NOS: 89%).

Conclusions: Prevalence of CS among carcinoid patients (30%) was slightly higher than the 10% previously reported in the literature. In contrast, the prevalence of HS among pNET patients (23%) was lower than previously reported (42-85%). 15% of carcinoid patients without metastatic disease had CS, warranting further analysis as CS most often occurs in the presence of liver metastasis.