

Prospective analysis of clinical outcomes and prognostic factors in patients with neuroendocrine tumors (NETs)

Monica Ter-Minassian^{1,3}, Jennifer A. Chan³,
Christine S. Fraumeni³, Susanne M. Hooshmand³,
Kofi Asomaning¹, Xihong Lin², David C. Christiani¹,
Matthew H. Kulke³

¹Environmental and Occupational Medicine and Epidemiology (EOME) Program, Department of Environmental Health, Harvard School of Public Health, Boston, MA 02115; ²Department of Biostatistics, Harvard School of Public Health, Boston, MA 02115; ³Department of Medical Oncology, Dana-Farber Cancer Institute, Boston, MA 02115

Background: The clinical course of patients with neuroendocrine tumor remains poorly defined. A number of prognostic factors have been identified that we evaluated in a large prospective cohort.

Methods: We evaluated prognostic factors of 853 neuroendocrine tumor patients from the Dana-Farber Cancer Institute with a log-rank test and multivariate Cox regression analysis including age, gender, metastasis at initial diagnoses (stage M0 completely resected (reference) and M1 with metastases), tumor type (pancreatic (PET), small bowel carcinoid and other carcinoid (reference)), histologic grade (unknown, poor, moderate and well (reference)) and octreotide treatment (yes/no). Overall survival (OS) and time to recurrence (DFS) were also considered in NET subgroups.

Results: Among 853 neuroendocrine tumor patients, we identified 321 small bowel carcinoids and 190 PET and 342 tumors arising at other sites. Median overall follow-up time was 4.45 years. 210 (24.6%) deaths occurred with a median OS of 12.8 years. Patients had the following characteristics, 396 (46%) male, 457 (54%) female, 375 (44%) M0, 476 (55.9%) M1. Among M0 patients, the median OS was not reached and five and ten year OS rates were 94% and 75% respectively. Five and ten year DFS rates were 65% and 37% respectively. Median DFS was 7.9 years (9 yrs for small bowel carcinoid and 4.6 yrs for PET, and 10 yrs for other carcinoid). Factors predictive of recurrence were older age, male gender, PET and higher histologic grade. Among M1 patients, median OS was 7.6 yrs (12.5 for small bowel and 4.7 yrs for PET); five and ten year OS rates were 61% and 40% respectively.

Octreotide treatment was associated with a non-significantly protective OS HR of 0.87 (0.63, 1.19), $p=0.37$ in all patients.

Conclusion: Overall survival for NET patients may differ depending on tumor site of origin. Recurrences, when they develop, may occur more than 5 years from time of original resection.