

Survival Analyses of Pancreatic Neuroendocrine Tumors: Contrasting Institutional Databases with Population-based Studies

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Abstract:

Background: Prognostic data in pancreatic neuroendocrine tumors derives from population-based studies as well as from institutional databases.

Methods: The stage-stratified rates of 5-year survival derived from two institutional databases were contrasted with rates of 5-year survival derived from two national population-based studies (SEER 1973-2000 and National Cancer Data Base 1985-2004)

Results: The 5-year survival rates derived from the two separate institutional databases were concordant with each other, but markedly higher than the 5-year survival rates derived from the population databases (table 2). 5-year survival rates amongst stage IV patients were 55% and 57% in the institutional databases versus 15% and 19% in the population databases.

Conclusions: Survival rates derived from institutional databases are substantially higher than survival rates derived from national population databases. The causes of these differences have yet to be clarified.

Introduction:

- The prognosis of patients with metastatic pancreatic neuroendocrine tumors is poorly defined.
- Epidemiological databases such as the SEER registry are often quoted in the literature; however the reported survival durations (median 14-17 months in the metastatic setting) are not consistent with the indolent nature of pNETs.
- We evaluated whether institutional databases provided different prognostic information compared to national registries.

Methods:

- Three published databases, and one newly-developed database of 425 patients at Moffitt Cancer Center were analyzed (table 1)
- Survival outcomes (5-year survival rates and mean or median survival durations) were compared.

Table 1: Key features of analyzed databases

	Institutional		Population	
Database Source	Berlin University Charité-Campus, Berlin Germany	H. Lee Moffitt Cancer Center, Tampa, FL, USA	National Cancer Data Base (NCDB)	Surveillance, Epidemiology, and End-Results (SEER)
Years	1980-2003	1999-2010	1985-2004	1973-2000
Population	Foregut GEP-NETs	pNETs	Surgically resected pNETs	pNETs
Number of cases	202	425	1815	1483
Staging System	ENETS	ENETS and AJCC	AJCC	Local vs. Locally Advanced vs. Metastatic
Source	Pape et al. <i>Cancer</i> 2008; 113(2):256-65	Strosberg et al. ISGIO 2010	Bilimoria et al. <i>J Am Coll Surg</i> . 2007; 205(4): 558-63	Halfdanarson et al. <i>Ann Oncol</i> . 2008; 19(10): 1727-33

Results:

- The 5-year survival rates and median survival durations derived from the two separate institutional databases were concordant with each other, but markedly higher than the 5-year survival rates derived from the national population registries (tables 2 and 3).
- 5-year survival rates amongst stage IV patients were 55% and 57% in the institutional databases versus 15% and 19% in the population registries.
- Mean/Median survivals amongst stage IV patients were 69-88 months in the institutional databases versus 14-17 months in the population registries.

Table 2: 5-year survival rates of patients with pNETs stratified by stage: Institutional databases vs. population based registries

	Institutional		Population	
TNM Stage	5-Year survival rate (Pape)	5-year survival rate (Strosberg)	5-year survival rate (Bilimoria)	5-year survival rate (Halfdanarson)
Stage I	100%	100%	61%	62%
Stage II	89%	88%	52%	
Stage III	79%	85%	41%	53%
Stage IV	55%	57%	15%	19%

Table 3: Median/Mean survivals of patients with pNETs stratified by stage: Institutional databases vs. population based registries

	Institutional		Population	
TNM Stage	Mean survival (Pape)	Median survival (Strosberg)	Median survival (Bilimoria)	Median survival (Halfdanarson)
Stage I	Uncalc.	Uncalc.	112 months	100 months
Stage II	199 months	323 months	63 months	
Stage III	132 months	147 months	36 months	69 months
Stage IV	88 months	69 months	14 months	17 months

Conclusions:

- Stage-specific survival rates derived from institutional databases are markedly higher than survival rates derived from national registries.
- Outcomes reported in population databases (SEER and NCDB) are not reflective of the indolent nature of most NETs. Reported survival rates are inferior to more aggressive malignancies such as colorectal and breast cancer.
- The substantial discrepancies between institutional and population databases are not easily explained. Superior therapies offered at tertiary referral centers may partially explain improved outcomes observed in institutional databases. Referral biases may also contribute to discrepancies in survival; however it is unclear whether referral centers attract a more favorable prognostic group.

