

Functional Status and Resource Utilization of Elderly Patients with Neuroendocrine Tumors

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Background: Neuroendocrine tumors (NETs) are often classified by functional status. Functional tumors secrete hormonal peptides which lead to additional symptom burdens. The incidence of functional disease among the general NET population is not well-established. Further, it is largely unknown whether the resource utilization patterns differ by functional status. The current analysis estimates the incidence of functional NETs and the associated resource utilizations.

Methods: We identified NET patients diagnosed between 1/1999 and 12/2009 from the SEER-Medicare database, excluding those under age 65, enrolled in HMOs, or without continuous enrollment in Medicare Parts A and B. We defined functional NETs as patients who had any claims with a diagnosis indicative of carcinoid syndrome during the 3 months before and after the NET diagnosis. We quantified resource utilization as counts of events and Medicare payment, stratified by type of care (inpatient, outpatient, and emergency room) and compared patterns of resource utilization between patients with and without functional NETs. We used Cochran-Armitage trend test to test the trend in the incidence of functional NETs;

and used Wilcoxon two-sample test to compare resource utilizations between patients with and without functional NETs.

Results: Among the study cohort of 16,929 elderly NET patients, 3586 (21%) had carcinoid syndrome. The incidence of functional NET steadily increased throughout the study period, growing from 7.3% in 1991 to 34.1% in 2009. The trend is statistically significant with $p\text{-value} < 0.001$. Compared to patients without syndrome, patients with functional NET had higher resource utilizations in terms of all the measures we considered (Table 1). All the p -values were less than 0.001.

Conclusions: This population-based study reported an upward trend in the incidence of functional NET. The study also found that patients with functional NET consumed more healthcare resource.

| Resource utilization of NET patients during the 12 months after diagnosis | | | | | | | | | |
|---|------------|--------|----------------|--------|-----------------|--------|--------|------|-------|
| | total cost | | inpatient cost | | outpatient cost | | % hosp | % ER | # otp |
| | me | dia | me | dia | me | dia | | | |
| | an | n | an | n | an | n | | | |
| Patients with functional NETs | \$87,9 | \$52,0 | \$42,5 | \$31,7 | \$45,4 | \$13,7 | | 5 | 4 |
| Patients with non-functional NETs | \$62,3 | \$37,4 | \$31,5 | \$22,1 | \$30,8 | \$7,42 | 83 | 0 | 3 |
| | 85 | 47 | 29 | 09 | 55 | 4 | 69 | 8 | 1 |

% hosp: percentage of patients with at least one hospitalization

% ER: percentage of patients with at least one Emergency Room visit

otp: number of outpatient visits