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Survival outcomes after surgery for entero-pancreatic neuroendocrine tumors: a population-based analysis

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BACKGROUND

Surgery plays a key role in the management of entero-pancreatic neuroendocrine tumors (EP-NETs). Understanding contemporary outcomes is essential for integration in decision-making and patient counseling. We examined long-term outcomes following resection for EP-NETs.

METHODS

We conducted a population-based retrospective cohort study of patients with EP-NETs (2000-2023) undergoing resection in Ontario, Canada. The outcome of interest was overall survival (OS), as time from surgery to death from any cause, examined using Kaplan-Meier curves. Cox proportional hazard (OS) models examined factors associated with OS.

RESULTS

Of 3,536 patients included, 57.4% presented with metastases, 2,429 had small bowel (SB) NET (66.5% metastases) and 1,107 had P-NETs (37.5% metastases). Median follow-up was 6 years (IQR 3-10), and 1,144 patients (32.4%) died during follow-up. 10-year OS was 65.8% (95%CI 64.0-67.7%) after surgery overall, 67.1% (95%CI 65.0-69.4%) for SB-NETs and 59.9% (95%CI 56.3-63.6%) for P-NETs, after adjustment for age, sex, comorbidity burden, and year of surgery. In those with metastases, 10-year adjusted OS was 62.5% (95%CI 60.0-65.1%) for SB-NETs and 43.1% (95%CI 38.0-48.9%) for P-NETs. Advancing age, metastatic disease, and higher comorbidity burden were independently associated with inferior OS overall and for SB-NET and P-NETs, while female sex was independently associated with superior OS. Of all deaths, 642 were cancer-related. In the sub-group with metastases undergoing resection combined with hepatectomy, 10-year OS was 70% (95%CI 68-72) for SB-NETs and 10-year OS was 75% (95%CI 73-77) for P-NETs.

CONCLUSIONS

This study established contemporary long-term outcomes after resection of EP-NETs at the population-level. Patients with EP-NETs selected for surgery experience prolonged OS, driven by age, sex, and comorbidity burden, in addition to tumor factors. This information can be used to inform decision-making, patient counseling, and future trial designs.

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