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Contemporary incidence and survival of lung neuroendocrine neoplasms: a population-based study

Mathieu Rousseau¹, Elliott Wakeam², Simron Singh^{3,4}, Sten Myrehaug^{4,5}, Calvin Law^{1,4}, Victoria Barabash⁶, Wing C Chan⁷, Julie Hallett^{1,4}.

¹Department of Surgery, Université de Montréal, Montréal, QC, Canada; ²Department of Surgery, University of Toronto, Toronto, ON, Canada; ³Department of Medicine, University of Toronto, Toronto, ON, Canada; ⁴Susan Leslie Clinic for Neuroendocrine Tumors – Sunnybrook Health Sciences Centre, Toronto, ON, Canada; ⁵Department of Radiation Oncology, University of Toronto, Toronto, ON, Canada; ⁶Sunnybrook Research Institute, Toronto, ON, Canada; ⁷ICES, Toronto, ON, Canada.

BACKGROUND

While the epidemiology of overall and gastrointestinal neuroendocrine neoplasms (NENs) has been reported, data specific to lung NENs remain scarce. Such understanding is crucial in designing tailored strategies to improve care and outcomes. We examined the incidence, overall survival (OS), and disease-specific death (DS-deaths) for lung NENs.

METHODS

We conducted a population-based retrospective cohort study of adult patients with incident lung NENs over 2000-2019. We computed yearly incidence rates. Kaplan-Meier curves and Cox regression models examined OS. Cumulative incidence function and Fine-Gray models accounting for the competing risk of death from other causes were used to examine DS-deaths (for lung NENs).

RESULTS

Of 4,479 patients with lung NENs, median age at diagnosis was 67 (IQR 57-74) years old and 56.3% were female. Tumors were 45.9% typical carcinoid, 8.3% atypical carcinoid, 22.3% large cell tumors, and 23.6% neuroendocrine carcinomas, and 24.6% presented as stage IV. The incidence of lung NENs went from 0.87 to 2.9/100,000 from 2000 to 2019. By stage, this rise in incidence was observed for stage I (0.68 to 1.15) but not for stages II to IV. It was more pronounced for typical tumors (0.52 to 1.2) than other tumor types. With median follow-up of 34 months, 1 and 5-year OS were 69.5% (95%CI 68,1-70.8%) and 50.1% (95%CI 48.6-56.6%) for all tumors. Advancing age, lower socioeconomic status, atypical, large-cell and neuroendocrine carcinoma tumors (vs. typical), and stage III and IV disease (vs. stage I) were independently associated with inferior OS. Cumulative incidence of DS-deaths was 25% (95%CI 23.7-26.3%) at 1-year and 36.8% (95%CI 35.3-38.3%) at 5-year. Advancing age, atypical, large-cell, and neuroendocrine carcinoma tumors, and increasing stage from II to IV were independently associated with higher hazards of disease-specific-death, but not socioeconomic status. The non-lung-NENs-deaths exceeded DS-deaths starting 1 year after NEN diagnosis for typical lung NEN and 3 years after diagnosis for stage I disease.

CONCLUSIONS

The incidence of lung NENs has increased over 19 years, mostly driven by rising incidence of stage I disease potentially owing to increased detection. Patients with typical lung NEN and stage I disease were more likely to die of non-lung-NEN causes than of disease-specific causes after 1 and 3 years, respectively. In addition to age and tumor characteristics, socioeconomic status was associated with OS, but not DS-death.

These data are important to direct efforts in care organization, research design and prioritization, and patient counselling.

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