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Disparities in the rising incidence of early-onset neuroendocrine neoplasms

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BACKGROUND

More young people are being diagnosed with neuroendocrine neoplasms (NENs) in recent years, but the epidemiology is not well understood. We aim to describe the incidence of early-onset NENs and differences by patient and tumor characteristics in the diverse California population.

METHODS

All patients with malignant NENs diagnosed from 1992-2019 in the population-based California Cancer Registry were identified by histology (ICD-O-3 code 8013, 8041-5, 8150-5, 8240-9). Patients diagnosed by age 49 were designated as early-onset. Annual age-adjusted incidence rates (AIRs) by patient or tumor characteristic were calculated, compared using incidence rate ratios (IRRs), and described using Joinpoint regression temporal trend and annual percent change (APC).

RESULTS

Among 12,266 early-onset NEN patients identified, the majority (55%) were women. Most (52%) identified as Non-Hispanic (NH) White, 28% Hispanic, 10% Asian/Pacific Islander (API), and 9% as NH Black. Half (50%) were diagnosed with local stage, 21% regional, and 29% distant metastases. Nearly half (46%) had a gastrointestinal primary, 29% pulmonary, 10% pancreatic, and 15% other site. Surprisingly, the AIRs of pulmonary NENs improved steadily during years 1992-2019 (APC -3.3), but the other primary sites rose statistically significantly by 1.1 to 6.9 percent annually. In recent years, the AIRs rose for all other subpopulations tested, with some significant disparities to note; faster for women (APC 8.4) than men (6.5), faster for Hispanic Californians (11.2) than any other race and ethnicity (3.2 to 6.1), faster for urban residents (7.5) than rural (3.1), and faster for residents in the lowest socioeconomic status neighborhoods (8.0) than highest (5.7). The final overall AIR in year 2019 is 2.85 per 100,000 person-years. During the most recent ten-year block, the AIRs differ across every racial and ethnic population, as presented in the Table.

Latest 10-year age adjusted incidence rates (AIR) from 2010-2019 by race and ethnicity and incidence rate ratio (row/column) with Tiwari 95% confidence interval

	API	Hispanic	NH Black	NH White
N:	640	1,960	476	2,433
AIR:	1.53	1.90	3.02	2.57
API	1	0.81 [0.73,0.88]	0.51 [0.45,0.57]	0.60 [0.55,0.65]
Hispanic	1.24 [1.14,1.36]	1	0.63 [0.57,0.70]	0.74 [0.70,0.79]
NH Black	1.97 [1.75,2.23]	1.59 [1.43,1.76]	1	1.18 [1.06,1.30]
NH White	1.68 [1.54,1.83]	1.35 [1.27,1.43]	0.85 [0.77,0.94]	1

CONCLUSIONS

We found incidence rates of early-onset NENs rising significantly for all extra-pulmonary primary sites, and differences by geographic location, socioeconomics, sex, and race and ethnicity. Reasons for these wide differences are unclear, and further research is underway to better understand the mechanisms causing disparities.

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