

P-8

Risk Factors Associated with Gastroenteropancreatic and Lung Neuroendocrine Tumors: A Nested Case-Control Study from The All of Us Research Program

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BACKGROUND

The incidence of neuroendocrine tumors (NETs) continues to increase worldwide, with a 4.5-fold increase between 1975 and 2019 in the USA. Gastroenteropancreatic (GEP) and lung NETs are the most common NET sites. However, the etiology of NETs remains inconclusive.

METHODS

Of 2,180 individuals, most cases and controls were non-Hispanic White (62.8%). The mean age at primary consent date was 63.01 (\pm 11.99) years in cases and controls. Females outnumbered males (61.0% vs. 39.0%) in cases and their matched controls. Among 366 cases, 118 (32.2%) had lung NETs and 248 (67.8%) had GEP NETs. Individuals with a family history of any cancer (OR, 1.43; 95%CI, 1.06 to 1.95, P=0.021), a past diagnosis of type 2 diabetes (OR, 1.46; 95%CI, 1.09 to 1.96, P=0.012) and any immune-mediated disease (OR, 1.40; 95%CI, 1.11 to 1.76, P=0.004) were at a higher risk of developing GEP or lung NETs. Male individuals with obesity, female individuals with genetic ancestries other than non-Hispanic White, having a family history of any cancer, and having a past medical history of type 2 diabetes or any immune-mediated disease were at a higher risk of developing GEP or Lung NETs.

RESULTS

Our study confirms a significant role of having a first-degree relative with any cancer and previous diagnosis of type 2 diabetes in the development of overall NETs and GEP NETs. Notably, we highlight for the first time, pre-existing diagnosis of any immune-mediated disease as a novel risk factor of developing NETs. These results suggest that the risk of developing NETs may be explained by both inheritable and environmental risk factors, with important site-specific differences in risk profiles by gender and race.

CONCLUSIONS

In our cohort, there were differences in SDOH between those with more aggressive tumor characteristics on presentation such as LNI being associated with less vulnerable neighborhoods. This may indicate a protective factor due to surgeon access or referral bias, indicating a need for targeted outreach among those diagnosing or caring for patients with PNETs.

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