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Mapping the Patient Journey to Neuroendocrine Tumor (NET) Diagnosis Using Real-World Data (RWD)

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BACKGROUND: Diagnosis of NETs is complicated often with >5 years delay to diagnosis. We explored methods to reveal the journey to diagnosis of NET.

METHODS: IBM MarketScan administrative claims databases were used to select adult patients with NET during 1/1/2015-12/31/2018 and matched 3:1 on age/gender to Non-NET cancer-free controls. The index date (earliest NET diagnosis or randomly assigned for controls) was preceded by a 5-year look back period (diagnostic period). Predictors (e.g. procedures, symptoms, conditions for which NET is commonly misdiagnosed) were examined to understand time from first potential misdiagnosis to NET diagnosis using linear regression. Predictors (e.g. procedures, symptoms, conditions) associated with NET diagnosis (vs. no NET diagnosis) were explored using logistic regression. Conditional inference trees were constructed to examine combinations of factors predictive of outcomes.

RESULTS: There were 3,460 NET patients and 10,370 non-NET controls included. 70% of patients with NET had a commonly misdiagnosed condition prior to diagnosis. Median time from first potential misdiagnosis to NET diagnosis was 3.4 years. Conditions associated with a significantly ($p<0.05$) longer time to diagnosis included irritable bowel syndrome, Crohn's disease, ulcerative colitis, gastritis/ulcer, asthma, cough, liver disorders, rash/rosacea, and atopic dermatitis. Having many unique healthcare provider types and most misdiagnosis conditions were positively associated with NET diagnosis ($p<0.05$). Decision trees provided insight into combinations of factors influencing time to diagnosis.

CONCLUSION: This analysis provides a first look at using regression analysis and decision trees to examine the journey to NET diagnosis using RWD. Future research using automated statistical methodology may be clinically impactful.

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