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Liver-Directed Therapy of Neuroendocrine Liver Metastases

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BACKGROUND
The optimal therapy sequencing for metastatic neuroendocrine tumors (NETs) remains undefined. Recent advances in systemic therapies may have changed approaches. Better understanding in patterns of care is necessary to assess and design treatment strategies. We examined the use of factors associated with liver-directed therapy over time.

METHODS
We conducted a population-based study of metastatic NETs over 2000-2019. Outcomes were use of liver-directed therapy, sub-divided into liver resection and embolization. Bi-yearly incidence rate of use in eligible patients (alive and no prior liver-directed therapy) was assessed. Multivariable Poisson models examined factors associated with use of liver-directed therapies.

RESULTS
Of 5,159 metastatic NETs, 922 patients (16.7%) received liver-directed therapy (461 embolizations, 329 resections, 132 dual therapy) at median of 35 days (IQR:0-490) after metastatic diagnosis. Incident use of liver embolization increased after 2013 to reach 72% in 2018-2019. Incident use of liver resection followed a similar trajectory up to 94% in 2018-2019. Gastro-entero-pancreatic primary NET (relative risk - RR 5.69, 95%CI 3.76-8.60), female sex (RR 1.25, 95%CI 1.05-1.48), year of diagnosis (RR 1.32, 95%CI 1.04-1.68 for 2007-2015), and lower socioeconomic status (RR 0.93, 95%CI 0.87-0.98 by incremental material deprivation quintile) were independently associated with liver resection. Gastro-entero-pancreatic primary NET (RR 2.8, 95%CI 2.2-3.7), socioeconomic status (RR 0.94, 95%CI 0.89-0.99 by quintile) and year of diagnosis (RR 0.71, 95%CI 0.59-0.85 for 2007-2015 and RR 0.61, 95%CI 0.50-0.75 for 2016-2020) were independently associated with risk of liver embolization.

CONCLUSIONS

Receipt of liver-directed therapies for metastatic NETs has increased over time in unadjusted analysis. However, there was lower risk of liver embolization in most recent time periods, but higher risk of resection. Socio-economic status represented an independent factor for lower likelihood of liver-directed therapies. Further characterization of timing and outcomes of liver-directed therapy, with an equity lens, is warranted to define the optimal sequencing.

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