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Intra-Arterial Peptide Receptor Radionuclide Therapy Using Y-90 DOTATOC for Hepatic Metastases of Gastroenteropancreatic Neuroendocrine Tumors

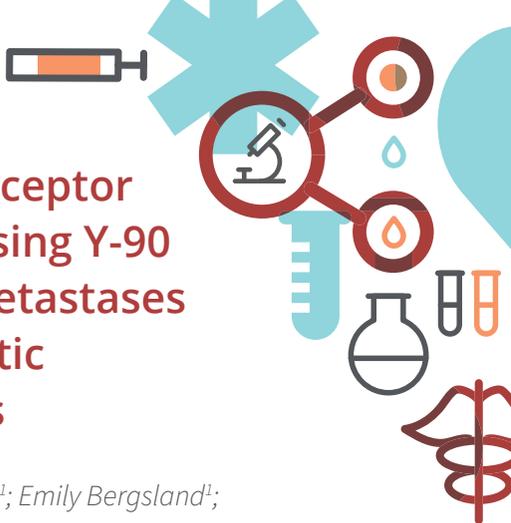
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BACKGROUND: Intravenous Lu-177 DOTATATE (a form of peptide receptor radionuclide therapy, PRRT) delays progression in metastatic gastroenteropancreatic neuroendocrine tumors (GEP-NETs). Up to 75% of GEP-NET patients have liver metastases. We aimed to determine whether direct intra-arterial (IA) injection of 90Y-based PRRT into the liver would achieve higher intratumoral concentrations of PRRT, thus maintaining efficacy while reducing systemic toxicity.

METHODS: PRRT-naïve GEP-NET patients with liver-predominant metastases involving <70% of the liver were enrolled in this pilot, single-center, open-label study. Patients underwent baseline PET/CT imaging using intravenous 68Ga-DOTATOC. On a subsequent date, 94.7 ± 5.4 mCi 90Y-DOTATOC was administered into the proper hepatic artery over 30 minutes. The first five patients concurrently received IA 68Ga DOTATOC and underwent PET imaging within 1 hour. All patients were followed for response (RECIST1.1) and toxicity (CTCAE v4.0) (median 44 weeks, range 24 to 52).

RESULTS: Of 10 enrolled patients, 30% (3/10) pts experienced grade 3 adverse events (AEs) (2/10 bilirubin, 1/10 anemia). During the follow-up period, best response was SD in 70% (7/10) and PD in 30% (n=3/10). No PR or CR was observed. Patients who received IA 68Ga DOTATOC failed to demonstrate increased uptake by hepatic metastases compared to IV, with average IA:IV



SUVmax ratio 0.86 +/- 0.24. However, extrahepatic metastases and background demonstrated expected decreased uptake between IA and IV (ratio 0.68 +/- 0.19).

CONCLUSION: Our study demonstrated that administration of PRRT via the proper hepatic artery is generally safe and well tolerated. However, a single treatment resulted in minimal disease response. In addition, in contrast to previous reports, there was no increased uptake of ⁶⁸Ga DOTATOC in hepatic metastases when delivered IA compared to IV. One possible reason is somatostatin receptor saturation, as the imaged ⁶⁸Ga-DOTATOC was administered alongside a much larger dose of ⁹⁰Y-DOTATOC than diagnostic doses of somatostatin receptor agonists used in prior studies.