

Theranostics with I-131/I-123 *Meta*-Iodobenzylguanidine (MIBG) in Stage IV Advanced Malignant Neuroendocrine Tumors

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Background: Clinical outcomes of a group (n=50) of unselected Stage IV NETs (all types and grades), scanned and treated with I-123/I-131 MIBG were evaluated at a single center multidisciplinary specialty clinic. These unselected advanced NETs were compared with all grades of small bowel (SB) NETs as well as G1 SB NETs for outcomes.

Methods: This study began in June of 2008, and continued to June of 2014. NET patients, receiving standard of care (SOC) consisting of cytoreductive surgery, and multidisciplinary care were selected from our active NET Clinic. Subjects had to demonstrate progressive disease while receiving SOC, and demonstrate intense uptake of the I-123 MIBG radiopharmaceutical in all tumor sites larger than 1.0 cm. Clinical outcomes and Kaplan-Meier survival rates from histological diagnosis were recorded.

Results: In an unselected population of NETs, many with aggressive histology, 46% of patients improved symptoms after I-131MIBG treatment. 54% were stable, or worsened symptomatically (34% and 20%, respectively). Only a minority (10%) showed any radiographic response, and there were no CRs. After 6.0 yrs of follow up from MIBG treatment, 44% of these patients were still alive. In SB (all grades) carcinoids, early survival was similar to all types of NETs, but after 10 yrs from diagnosis, SB carcinoids (G1, G2, G3), treated with I-131 MIBG had significantly better survival (at least 20% better) than the population of all NETs. When MIBG treated non-well differentiated SB carcinoids were excluded, there was further improvement in survival from histological diagnosis. G1 SB carcinoids treated with I-131 MIBG had an additional further survival advantage of 21% (41% greater than unselected NETs).

Conclusions: I-131MIBG is most valuable in treatment of well differentiated carcinoid tumors with survival advantage of at least 40% over unselected NETs and a 20% survival advantage over intermediate and high grade carcinoid tumor patients.