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Validation of a Clinical Score (CS) for Patients With Well-Differentiated Neuroendocrine Tumors (WD NETs) Under Consideration for Peptide Receptor Radionuclide Therapy (PRRT) With ^{177}Lu-Dotatate

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BACKGROUND: We originally developed a CS prospectively at Vanderbilt Ingram Cancer Center (VICC) for patients being considered for PRRT and demonstrated the score to be associated with progression-free survival (PFS) in patients receiving PRRT. Herein, we present the performance of the CS in a validation cohort (VC) and combined cohort (CC).

METHODS: Our original cohort (OC) included patients under consideration for PRRT(N=122) between 3/1/2016-3/17/2020 at VICC while our VC included patients under consideration for PRRT(N=126) between 1/25/2017-3/6/2020 at Ochsner, Markey and Rush Cancer Centers. All patients in the OC were prospectively scored while patients in the VC were scored retrospectively, with the CS-assigning investigator blinded to patient outcomes. The primary outcome PFS, was estimated by the Kaplan_Meier method; a Cox proportional hazards model adjusting for primary tumor site, tumor grade and number of PRRT doses administered(0, 1-2 or 3-4) was used to analyze effect of CS.

RESULTS: In our VC, on multivariable (MV) analysis, for each 2-point increase in CS, the hazard ratio (HR) for PFS was 2.58 (95% CI 1.62-4.11). We combined the OC and VC for this analysis to increase the predictive power of our originally developed Cox proportional-hazards model. In our CC(N=248), median patient age, CS and number of prior treatments were 63.3 years, 4 and 1, respectively. A total of 140, 82 and 26 patients received 3-4, 0 or 1-2 doses of PRRT, respectively. On MV analysis, for each 2-point increase in CS, the HR for PFS was 2.52 (95% CI 1.90-3.35). No interaction between PRRT doses administered and CS was observed.

CONCLUSION: Increases in CS were strongly associated with worsening PFS in our VC, validating findings from our OC. The CS is at minimum prognostic and represents the first clinical metric which can estimate the anticipated benefit from PRRT for individual patients with WD NETs.

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