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Safety of Transarterial Liver Directed Therapy for Metastatic Neuroendocrine Tumor for Patients with Carcinoid Heart Disease

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BACKGROUND

Transarterial liver directed therapies such as bland embolization, transarterial chemoembolization and Yttrium-90 radioembolization help control tumor burden for patients with neuroendocrine tumor liver metastases. Functional neuroendocrine tumors secrete vasoactive substances that can lead to carcinoid heart disease. The purpose of this study is to evaluate the safety of liver embolotherapy and risk of cardiac adverse events (AEs) in the setting of carcinoid heart disease.

METHODS

This study was a retrospective analysis at two institutions of patients with well-differentiated neuroendocrine tumor liver metastases and carcinoid heart disease who underwent embolotherapy from 2000 to 2023. The incidence of cardiac adverse events was reported, and the severity of AEs was graded based on the Common Terminology Criteria for Adverse Events (CTCAE) Version 5.0. Significant associations between the prevalence of cardiac adverse events with ECOG status and severe tricuspid regurgitation were estimated with the Chi-Square Test of Independence. Overall survival was estimated using the Kaplan-Meier method.

RESULTS

Twenty-nine patients (15 men, 14 women, mean age 59 years) underwent 79 embolotherapies (35 bland embolization, 31 conventional TACE, 11 radioembolization). All patients had echocardiography confirmed tricuspid (n=24) and/or pulmonic valve (n=20) thickening, regurgitation or prior valve replacement (n=7). Valvular regurgitation ranged from none to severe, with 16 patients (55.2%) demonstrating severe tricuspid regurgitation and 4 patients (13.8%) having severe pulmonic regurgitation. Sixteen patients had Grade 1 neuroendocrine tumor, 12 had Grade 2, and 1 had Grade 3. Primary tumor sites were small bowel (n=23), large bowel (n=3), and pancreas (n=3). Cardiac AEs occurred following 7 of 79 procedures (8.9%) in 7 patients. Five AEs characterized by heart failure necessitated hospitalization (CTCAE Grade 3 and above), including one ICU admission. AEs requiring hospitalization started 1-39 days following treatment (median 17 days). Hospital stay ranged from 2-14 days (median 4 days). All hospitalized patients were medically managed and discharged. Two AEs were managed as outpatients. The prevalence of cardiac AEs was not significantly associated with ECOG

performance status (P=0.712) nor the presence of severe tricuspid regurgitation (P=0.321). Overall survival following embolotherapy at 1 year, 3 years and 5 years was 85.7%, 70.4% and 43% respectively.

CONCLUSIONS

Transarterial liver directed therapies for patients with carcinoid heart disease was associated with 8.9% prevalence of cardiac adverse events, which all improved with medical management. Larger studies to further elucidate the relative risk of cardiac toxicities for patients with carcinoid heart disease are warranted.

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