Background Immune checkpoint inhibitors (ICI) are associated with a distinct spectrum of toxicities. Data on irAE hospitalization rates and clinical course of patients with thoracic malignancies are lacking.

Methods Patients with advanced thoracic malignancy treated with ICI (2/2016 – 6/2021) were retrospectively identified. Demographic and clinical data of confirmed irAE hospitalizations were extracted from the medical record and a descriptive analysis was performed.

Results From February 2016 to June 2021, 1,312 patients with thoracic malignancy received ICI (monotherapy, combination with 2nd ICI or other agents) with 102 patients (7.7%) hospitalized for irAEs. Treatment intent was first-line therapy with ICI in most patients (N= 50, 49%) and adjuvant ICI in 9% (N =9). 59% (N =60) received ICI alone, 32% (N =33) chemo plus immunotherapy, and 7% (N =7) dual ICI. The average age on admission was 68 years in both genders. The median time between ICI initiation and admission was 64 days (1-935). The most common evidenced irAEs were pneumonitis (N = 38, 37%), hepatitis (N = 20, 20%), myocarditis (N = 14, 14%) and colitis (N = 13, 13%). Nearly half (N = 18, 47%) of patients with pneumonitis were treated with prior thoracic radiation and received first line (N = 22, 58%) ICI. Pneumonitis cases had the highest 60-day readmission rate (37%, N = 14) with a 60-day mortality rate of 53% (N = 20). 60-day re-admission and mortality rates were 19% (N = 17) and 29% (N = 26), respectively, among the rest of the cohort. Multi-organ toxicity occurred in 36% (N = 37) of patients. Myocarditis patients often had a concomitant irAE (79%; 11/14) with 36% (N = 5) presenting overlapping neuromuscular toxicity. Overall, 64% (N = 65) received IV corticosteroids for a median duration of 42.5 days (0-527) and 18% (N = 18) required second line immunosuppression. irAEs solved to grade 1 or less after immunosuppression in 63 patients. Seven patients (7%) experienced a grade 5 event while admitted. ICI rechallenge occurred in 14 patients. Median OS was 360 days; (16 – 2219, table 1).

Conclusions Severe irAE requiring inpatient admission, though infrequent, results in considerable morbidity, mortality, and healthcare utilization. Pneumonitis was the most common irAE requiring inpatient management in our lung cancer population with a significant risk of mortality despite the use of guideline-directed systemic immunosuppression. This study highlights the continued need for prospective research to optimally manage severe toxicities, particularly pneumonitis.

Ethics Approval The study obtained IRB approval.

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