TROPONIN-T LEVELS AND LONG-TERM SURVIVAL IN IMMUNE CHECKPOINT INHIBITOR ASSOCIATED MYOCARDITIS

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Background Immune checkpoint inhibitor (ICI) associated myocarditis carries a high rate of morbidity and mortality. Despite the clinical consequences, little is known about the relationship between initial troponin-T (TnT) levels at presentation and prognosis or concurrent immune related adverse events (irAEs).

Methods We conducted a retrospective analysis of 37 patients diagnosed with ICI-associated myocarditis at Massachusetts General Hospital in Boston, MA between March 1, 2016, and March 1, 2022. Clinical data including patient demographics, cancer type, ICI regimen, lab values, cardiac tests, immunosuppressive treatment, diagnostic procedures, and survival were obtained from the electronic medical record. Patients were categorized into three groups based on the first measured TnT during the admission for myocarditis: 1) mild elevation (<five-fold the institutional upper limit of normal [ULN]), 2) moderate elevation (five to 50-fold the ULN), and 3) high elevation (>50-fold the ULN). Statistical analyses were performed using the Fisher-Freeman-Halton exact test and Cochran-Armitage test for trend.

Results This cohort consisted of 29 men and 8 women with a median age of 74.5 years. Cancer types included non-small cell lung cancer (n=11), melanoma (n=9), RCC (n=9), SCC (n=3), and other types of cancer (n=5). The median time of myocarditis onset from the start of ICI was 49.5 days. ICI regimen primarily consisted of pembrolizumab (n=21) and nivolumab (n=12). Concurrent irAEs occurred in 17 patients during their index admission. Of the total cohort, 30% of patients had a mildly elevated TnT, 46% moderately elevated, and 24% highly elevated. 10 patients died within 30 days of myocarditis diagnosis, 8 patients died between 30 and 180 days, and 19 were alive past 180 days. Of those patients that died prior to 30 days from diagnosis, 60% had highly elevated TnT and 40% had moderately elevated TnT; however, of the patients alive past 180 days, 37% had mildly elevated TnT, 47% had moderately elevated TnT, and 16% had highly elevated TnT levels (figure 1; p=0.014 for the association of TnT elevation grade with survival category). Furthermore, while concurrent irAEs were diagnosed in 27% of patients with mildly elevated TnT, they were present in 47% of patients with moderately elevated TnT and 67% of patients with highly elevated TnT (figure 2; p=0.078 for test of trend).

Conclusions Initial TnT values at time of presentation with ICI-related myocarditis associate with patient survival to at least 180 days from time of diagnosis. Initial TnT values may be related to the presence of concurrent non-myocarditis irAEs.

Ethics Approval The study was approved by Mass General Brigham’s Ethics Board, approval number 2017P000501.