

## Letter to Editor

# Implementation of Cardiac Monitoring and Prevention Strategies Prior to CAR-T Cell Therapy to Prevent Cardiac Complications

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Dear editor,

We would like to highlight some facts recently seen with Chimeric antigen receptor (CAR)-T-cell therapy and suggest a few recommendations in order to prevent significant mortality and morbidity due to cardiac complications after CAR T-cell therapy. CAR-T-cell therapy has been a relatively new and novel treatment for certain hematological and solid organ malignancies and has proven to be beneficial in treating some refractory malignancies. However, some concerning life threatening toxicities have been identified which need effective preventive strategies. Some of the reported

complications include cytokine-release syndrome (CRS), which is the most frequently observed complication followed by CAR-T-cell-related encephalopathy syndrome (CRES) and rarely, fulminant hemophagocytic lymphohistiocytosis (HLH) and CAR-T-cell therapy mediated myocarditis [1-3]. The most common symptoms which point towards an impending life-threatening cardiac complication are reported to be mostly systemic and overlapping for CRS and myocarditis including hemodynamic instability (hypotension, hypoxia, tachycardia, arrhythmias), nausea, vomiting, pulmonary edema, and renal failure secondary to compromising circulation. Multiple treatment guidelines exist for the management of post-

CAR T-cell therapy CRS such as treatment with antipyretic, antiemetics, steroids, IL-6 blocker (tocilizumab), and inotropic support, as CRS is a commonly reported complication [1, 2] but there are no recommendations for the prevention of myocarditis as only a few cases have been reported [3].

Proper guidelines should be established for cardiac monitoring before and after CAR T cell therapy to prevent myocarditis and sudden cardiac arrest. All patients should undergo checking for their basic cardiotoxicity profile prior to receiving any form of immunotherapy and certain prevention strategies should be designed to reduce the incidence of cardiac events and sudden cardiac deaths [3-5]. Serum biomarkers (troponins, NT-pro brain natriuretic peptide) can help in cardiac surveillance along with echocardiography and advanced cardiac imaging modalities like cardiac magnetic resonance (CMR) imaging might be useful while developing cardioprotective therapies [6]. Since most of the cardiac toxicity occurs quite rapidly after CAR T cell therapy, designed strategies should consider the timing of toxicity alongside the fact that there might be some delayed consequences that haven't been reported yet, and more surveillance is required to assess those delayed complications. The highlight of this letter is to improve the overall cardiovascular outcome in patients who receive CAR T-cell therapy and it is only possible if there are effective strategies to tackle it [6, 7].

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