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CT-423

Neuropsychiatric Disorders in Hospitalized Patients Undergoing Chimeric Antigen Receptor T-Cell Therapy for Multiple Myeloma

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Context: Chimeric antigen receptor T-cell (CAR-T) therapies have shown efficacy in treatment of relapsed/refractory multiple myeloma (MM). Neuropsychiatric disorders (NPD) in patients undergoing CAR-T have not been well described. **Objective:** To evaluate prevalence of NPD in patients who underwent in-hospital CAR-T therapy for MM and explore association of NPD with in-hospital outcomes of CAR-T therapy. **Design:** Retrospective. **Setting:** We evaluated NPD among patients undergoing in-hospital CAR-T therapy for MM in 2018 using data from the National Inpatient Sample (NIS). We applied discharge level weights to extrapolate findings to hospitalizations across the nation. **Patients:** Hospitalizations for patients ≥ 18 years who received investigational CAR-T therapy for MM were selected from the NIS database using International Classification of Disease, Tenth Revision (ICD-10) procedure and diagnostic codes. Demographic and CAR-T treatment variables were collected. Regression models were fit to assess association of NPD with clinical variables, and odds ratios (OR) were reported. **Main Outcomes Measures:** The primary outcome was prevalence and distribution of NPD. The secondary outcome was association of NPD with CAR-T outcomes. **Results:** A total of 200 CAR-T procedures met inclusion criteria; 65% males, 71% Caucasians, and 15.8% African Americans, with a median age of 59 years. Most CAR-T procedures (95%) were performed in urban teaching hospitals. Prevalence of NPD was 27.5%. Anxiety was the most common NPD, then depression and insomnia. Patients with NPD, compared to those without, were more likely to have Charlson comorbidity index (CCI) > 3 (54.5% *versus* 20.7%, p= 0.01). There were no observed differences in the distribution of NPD with regard to race, age, gender, insurance, or prior receipt of bone marrow transplantation. Association was noted between NPD and CCI ≥ 3 (OR= 4.60, 95% CI= 1.29–16.40), between NPD and fever (OR= 0.16, 95% CI= 0.04–0.70). No significant association were found between NPD and neurotoxicity, in-hospital mortality, respiratory or renal failure, length of stay, or hospital charges. **Conclusions:** One in every four patients who underwent CART therapy for MM in 2018 had NPD. Patients with multiple comorbidities were at higher risk, while patients with fever during CART therapy were likely underdiagnosed with NPD. **Keywords:** CT, CAR-T therapy, neuropsychiatric disorders, multiple myeloma

CT-436

Chimeric Antigen Receptor T-Cell Therapy (CAR-T) in Adults with B-Cell Acute Lymphoblastic Leukemia (B-ALL): A Systematic Review and Meta-Analysis

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Background: Chimeric antigen receptor (CAR)-T therapy has transformed the treatment paradigms for relapsed/refractory (r/r) B-cell acute lymphoblastic leukemia (ALL) in children and younger adults. Several groups have carried out early-phase trials of various CAR-T cell constructs in adults with r/r B-ALL. Recognizing that CAR-T outcomes in adult ALL are likely to differ from pediatric reports, we undertook a systematic review and meta-analysis to investigate the efficacy and toxicity of CAR-T therapy in adults with r/r B-ALL. **Methods:** We searched MEDLINE, Embase, and the Cochrane Library for prospective, interventional studies of adults with B-ALL treated with CAR-T therapy. We included studies that enrolled ≥5 patients and excluded studies with a median age <18 years to enrich for adult patient populations. **Results:** A total of 2566 records were assessed, and 15 studies involving 434 patients were included in the final analysis. All studies were single-arm, prospective clinical trials of patients with r/r B-ALL with 2–4 median prior lines of therapy. The majority of studies (11/15) included both pediatric and adult patients, but four of the studies enrolled only adults. The cumulative CR rate was 82.4% (95% CI:73.2–89.6%), and MRD-negative remission rate was 80.2% (95% CI: 69.4–88.5%) at 4 weeks post-CAR-T infusion. The cumulative 12-month PFS was 38.3% (95% CI: 27–49.5%), and OS was 56% (95% CI: 47–64); 42.9% patients relapsed at any time during follow-up, and antigen-positive relapse was three times more frequent than antigen-negative relapse. The cumulative incidence of any grade CRS was 81.7% (95% CI: 54.1-95–95%) and grade 3 or higher CRS was 27% (95% CI: 17.8–37.5%). The cumulative incidence of any grade neurotoxicity was 28% (95% CI: 13.3–49.1), and grade 3 or higher was 12.1% (95% CI: 0.7–26%). **Conclusions:** CAR-T therapy achieves high early remission rates in adults with r/r B-ALL and represents a significant improvement over traditional salvage chemotherapy. However, relapses are common, and durable response remains a challenge. These results will aid clinicians caring for adults with r/r B-ALL and will serve as a benchmark for investigators studying CAR-T cell therapies in adult ALL. **Keywords:** CT, acute lymphoblastic leukemia, chimeric antigen receptor, CAR-T, adult