CAR T-Cell Therapy for Relapsed/Refractory Aggressive Large B-Cell Lymphoma

Jacklyn Gideon, MSN, AGPCNP-BC

Cellular immunotherapy with CD19-directed chimeric antigen receptor (CAR) T-cell therapy has changed the treatment landscape for aggressive B-cell non-Hodgkin lymphoma (B-NHL). Three CAR T-cell therapies are commercially available for the treatment of large B-cell lymphoma. This article reviews a case study to highlight a typical treatment journey for a patient with relapsed large B-cell lymphoma undergoing cellular immunotherapy, including treatment timeline and toxicities, as well as implications for advanced practice providers caring for patients with B-NHL.

AT A GLANCE

- CD19-directed CAR T-cell therapy has shown effectiveness in the treatment of aggressive B-NHL, with some patients achieving durable remissions.
- Cellular immunotherapy can lead to unique toxicities, including cytokine release syndrome and immune effector cell–associated neurotoxicity syndrome.
- Academic and community advanced practice providers manage patients receiving CAR T-cell therapy.

KEYWORDS
CAR T-cell therapy; B-cell lymphoma; cytokine release syndrome; ICANS

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Chimeric antigen receptor (CAR) T-cell therapy is a form of cellular immunotherapy that uses genetically engineered T cells to destroy cancer cells (June & Sadelain, 2018). This type of personalized immunotherapy has shown effectiveness in the treatment of a wide range of hematologic malignancies, including aggressive B-cell non-Hodgkin lymphoma (Maude et al., 2014; Neelapu et al., 2017; Schuster et al., 2019). Three CAR T-cell therapies (see Table 1) have been approved by the U.S. Food and Drug Administration (FDA) for the treatment of relapsed/refractory large B-cell lymphoma (LBCL) following the failure of two or more systemic therapies. These therapies have collectively demonstrated durable remissions in 30%–40% of patients (Abramson et al., 2020; Neelapu et al., 2017; Schuster et al., 2019).

The three commercially approved CAR T-cell therapies for LBCL target CD19, which is an antigen commonly expressed in B-cell cancers (Chavez et al., 2019). Since being approved by the FDA in 2017, CAR T-cell therapy has transformed the therapeutic landscape and significantly affected the treatment of patients with aggressive B-cell non-Hodgkin lymphoma. When caring for patients with hematologic malignancies, advanced practice providers (APPs) require an understanding of CAR T-cell therapy, including indications, logistics, short- and long-term toxicities, and recommended monitoring. This article presents a case study of the CAR T-cell journey of a patient with relapsed diffuse LBCL (DLBCL) from time of referral through long-term follow-up.

Case Study With Background

A 66-year-old man with relapsed DLBCL was referred for consideration of CAR T-cell therapy after failing two previous lines of therapy. CAR T-cell therapy is administered only at authorized treatment centers because of the specialized components of treatment and its unique toxicities, including cytokine release syndrome (CRS) and immune effector cell–associated neurotoxicity syndrome (ICANS) (Jacobson et al., 2020). The process for a patient to receive CAR T-cell treatment generally takes four to six weeks from the time of referral to CAR T-cell infusion.

At initial consultation, the patient presented with complaints of abdominal pain, 10-pound weight loss, and night sweats secondary to relapsed