

Study finds MRI and lumbar puncture not necessarily required to manage CAR T-cell therapy complications

March 19 2024



Credit: MART PRODUCTION from Pexels

Magnetic resonance imaging (MRI) and lumbar puncture (LP) may not always be necessary for diagnosing and managing a serious neurological

complication associated with CAR T-cell therapy, according to a new *Blood Advances* study. Findings further validated the use of the electroencephalogram (EEG)—a noninvasive test measuring electrical activity in the brain—in managing this neurotoxicity.

"When treating patients for CAR T-cell associated toxicities, we typically follow pretty rigid guidelines based on phase one and two studies, and there is little to no clinical evidence to validate these," explains Dr. Guillaume Manson, a hematologist at the University Hospital of Rennes in Rennes, France, and the study's senior author.

"Some of these tests, like a [lumbar puncture](#), can be extremely taxing and invasive for patients. Here, we wanted to get a better sense of when these interventions are necessary versus when we could do without them."

The authors sought to evaluate the necessity of three diagnostic tests used to manage care for recipients of CAR T-cell therapy experiencing immune effector cell-associated neurotoxicity syndrome (ICANS). While ICANS' underlying mechanisms are not entirely understood, patients with ICANS may experience a range of neurological symptoms, including confusion, tremors, seizures, and, in rare cases, serious brain swelling and comas.

National and international diagnostic guidelines recommend that health care providers perform an MRI, a LP, and and/or an EEG, based on a complication's severity, before beginning ICANS treatment. These interventions are expensive, can be invasive, and require extensive hospital resources. Further, these interventions are typically used to rule out other conditions and treatments are seldom modified by the results of these tests.

The study authors collected data from 190 patients treated with CAR T-

cells at the University Hospital Center of Rennes from August of 2018 to January of 2023. Out of all the patients in the study, about 62% were male, and the average age was 64 years old, with ages ranging from 15 to 81. Most of the patients were being treated for a type of lymphoma called refractory/relapsed diffuse large B cell lymphoma (DLBCL) (around 73%). During treatment, roughly 48% of patients developed ICANS.

All study participants met with a neurologist and underwent an MRI scan as a baseline assessment before receiving CAR T-cell infusions. Among those who experienced ICANS, their treatment protocol depended on their unique case and physician recommendation, abiding by the existing guidelines. Most patients with ICANS (80%) underwent at least one intervention, and a third (34%) underwent all three (MRI, LP, and EEG).

Researchers assessed how the different interventions affected patient treatment, such as how medications, for example, antibiotics, and anti-seizure therapy, were prescribed based on abnormal findings and how these treatment courses changed patient outcomes.

Of the 78% of patients who underwent MRI scans, 80% of scans showed normal results. Only 4% of those with abnormal findings had a change in treatment plans. Approximately 47% of patients underwent lumbar punctures, and no cases identified active infections, but 7% of patients had treatment change based on suspected infections.

Among the 56% of patients who received EEGs, only 18% of these scans showed normal results. In 45% of patients, EEGs detected brain dysfunction, and in some cases, signs of seizures, even in those with no prior symptoms. As a result, 16% of treatment plans were altered based on abnormal EEG findings.

Results ultimately revealed that abnormal results were more common in

patients with more severe ICANS. MRI results were often normal and while LP and EEG often showed abnormalities, it was more frequent with more severe cases of ICANS.

When it came to treatment decisions, MRI rarely led to changes, LP sometimes led to unnecessary treatments for suspected infections, and EEG often resulted in adjustments to antiepileptic medications.

This study is limited by its relatively [small sample size](#) and requires validation by further clinical studies. However, these findings suggest that LP and MRI might not always be necessary for all patients with ICANS, as they often did not influence treatment. However, EEG often led to adjustments in medications, suggesting it remains a necessary diagnostic intervention.

Ultimately, Dr. Manson conveys that these results represent a call to action to update existing guidelines for managing ICANS based on clinical evidence. He emphasizes that these results do not imply that practitioners should never perform MRIs or LPs, only that they may not be needed in all cases.

If further evidence confirms that MRIs and LPs are not necessary in all instances of ICANS, revised guidelines could potentially save patients time, money, and spare them from unnecessary medical procedures.

"Every patient's case is different, and these findings certainly do not say that certain tests should or should not be performed," said Dr. Manson. "We did this research to generate [clinical evidence](#) to inform guidelines that support physicians in making clinical decisions when treating patients with these complex, and sometimes severe conditions."

More information: *Blood Advances* (2024).

Provided by American Society of Hematology

Citation: Study finds MRI and lumbar puncture not necessarily required to manage CAR T-cell therapy complications (2024, March 19) retrieved 28 April 2024 from <https://medicalxpress.com/news/2024-03-mri-lumbar-necessarily-required-car.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.