

# Potentially serious side effect seen in patient after immunotherapy

December 10 2021

---



Credit: CC0 Public Domain

Mount Sinai scientists have become the first to report a potentially serious side effect related to a new form of immunotherapy known as CAR-T cell therapy, which was recently approved for the treatment of multiple myeloma. Their findings were published as a case study in *Nature Medicine* in December.

Multiple myeloma is a complex and incurable type of blood plasma cancer that often requires multiple treatments as the disease progresses and becomes resistant to previous therapies, often resulting in chronic disease with periods of acute illness.

CAR-T cell [therapy](#) uses genetically engineered immune system [cells](#) known as chimeric antigen receptor (CAR) T cells. In the specific version at issue, the CAR-T cells were used to target a protein known as B cell maturation antigen (BCMA). BCMA is commonly found in multiple myeloma, and this therapy has shown impressive response rates in people with particularly complex, treatment-resistant multiple myeloma.

More than three months after finishing a course of BCMA-targeted CAR-T cell therapy, the patient described in the Mount Sinai [case study](#) started showing progressive neurological features of symptoms resembling Parkinson's disease, including tremors as well as handwriting and gait changes. The patient later died due to complications from infection, and researchers found evidence of BCMA protein in the brain's basal ganglia and scarring in that area, suggesting that this serious side effect may have been due to the therapy targeting the BCMA in the brain.

"Our findings will impact the risk-benefit assessment of BCMA-targeted CAR-T cell therapy for multiple myeloma and have already led to improved monitoring and proactive management of neurologic adverse events across clinical trials of BCMA-targeted therapy," said Oliver Van Oekelen, MD, Ph.D. student at the Icahn School of Medicine at Mount Sinai and the first author of the manuscript.

Samir Parekh, MBBS, Professor of Medicine (Hematology and Medical Oncology), and Oncological Sciences, at Icahn Mount Sinai and the corresponding author of the case study, adds, "This study showed that BCMA-targeted CAR-T cell therapy can cross the blood-brain barrier at least in a subset of patients to cause a progressive neurocognitive and movement disorder. This shows that CAR-T cell therapies, although effective in multiple myeloma, warrant close monitoring for neurotoxicity, especially as such treatments acquire more widespread implementation in multiple myeloma patients."

BCMA-targeted CAR-T therapy and similar immunotherapies are being used or tested in other types of cancers, underscoring the importance of this study's findings.

In this study, researchers analyzed clinical data, blood, spinal fluid, and brain samples after the CAR-T infusion. Mount Sinai's Human Immune Monitoring Center, led by Miriam Merad, MD, Ph.D., found CAR-T cells in the blood and spinal fluid, leading scientists to believe this phenomenon led to the CAR-T cells targeting the basal ganglia and infiltrating the brain to cause the Parkinson's-like symptoms.

Though these findings are limited by the inherent fact that this is a case study on a single patient's reaction, a clinical trial of a BMCA-targeted CAR-T therapy has also reported that five percent of patients in the trial experienced movement and neurocognitive treatment-related adverse effects. Researchers also found evidence of BCMA expression in the

brains of healthy individuals.

**More information:** Van Oekelen, O. et al, Neurocognitive and hypokinetic movement disorder with features of parkinsonism after BCMA-targeting CAR-T cell therapy, *Nature Medicine* (2021).

[doi.org/10.1038/s41591-021-01564-7](https://doi.org/10.1038/s41591-021-01564-7)

Provided by The Mount Sinai Hospital

Citation: Potentially serious side effect seen in patient after immunotherapy (2021, December 10) retrieved 5 May 2024 from <https://medicalxpress.com/news/2021-12-potentially-side-effect-patient-immunotherapy.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.