

## Background

- Immune effector cell-associated neurotoxicity syndrome (ICANS) is a potential treatment-related adverse event of chimeric antigen receptor (CAR) T-cell therapy with severity ranging from mild to life-threatening.<sup>1</sup>
- Early intervention strategies hold promise in reducing the incidence and severity of ICANS.<sup>2</sup>
- ICANS grading is based on a non-validated ICE score and clinical signs. This method lacks predictive capacity and may detect ICANS too late, leading to a high cumulative dose of steroids to reestablish ICANS.

## Aim

To investigate the use of a novel EEG-based brain state monitor as a prediction tool for ICANS in patients receiving CAR T-cell therapy.

## Methods

- Adult patients with Large B-cell lymphoma receiving CD19-directed CAR T-cell therapy, between 2022 and 2023 at the University Medical Center Groningen, were prospectively included.
- Before and twice daily after CAR T-cell infusion, patients underwent a single channel electroencephalogram (EEG) recording (Fp2-Pz) using the DeltaScan (Prolira, The Netherlands). A score (1-5) was automatically generated.
- ICANS grade was determined according to the ASTCT consensus grading system and clinical interpretation of the ICE score was performed by the treating physician.

## Results

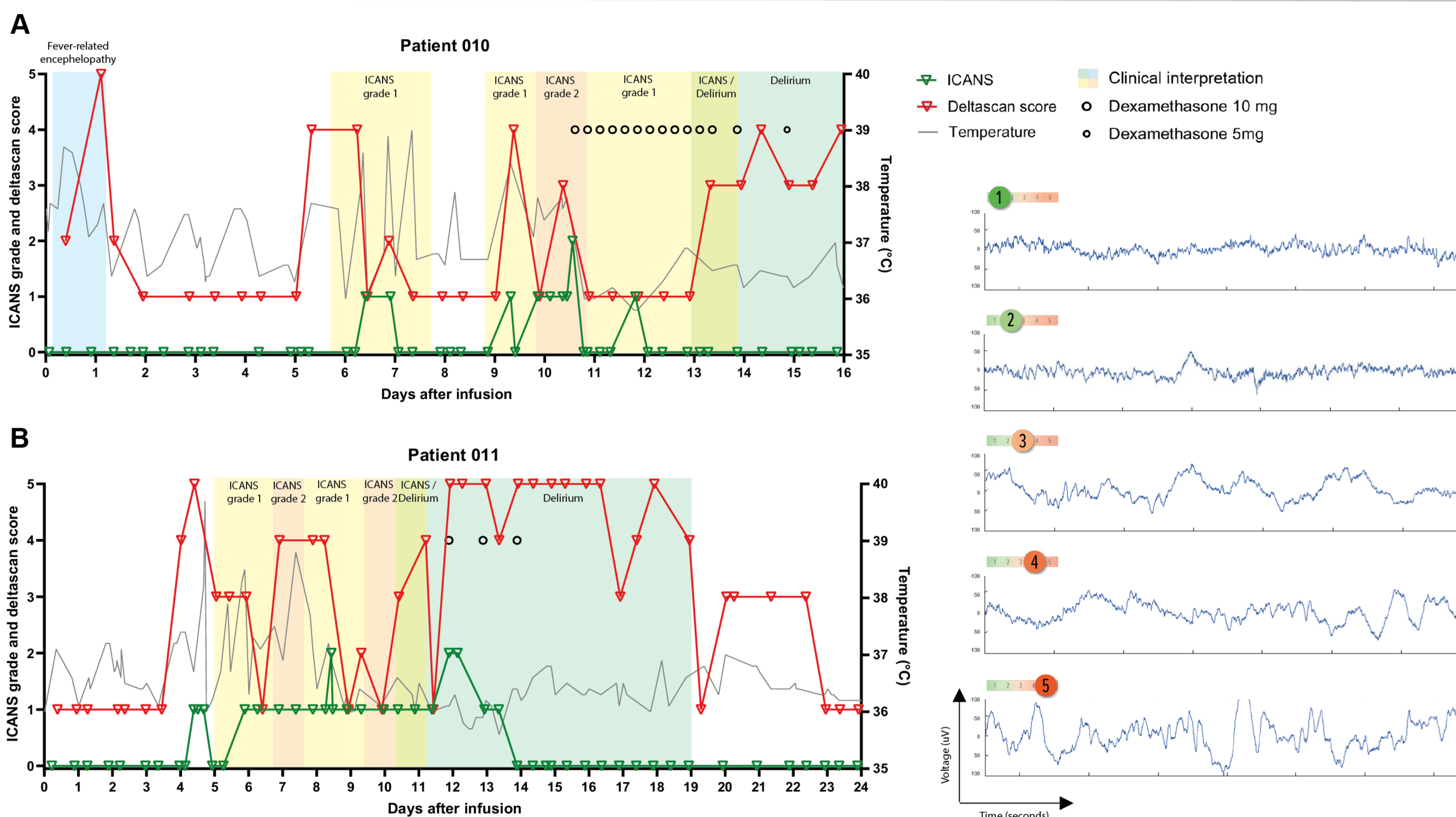


Figure 1. Timelines of patient 010 (A) and patient 011 (B). ICANS grade, Deltascan® score and temperature during hospitalization for chimeric antigen receptor (CAR) T-cell treatment. The blue, yellow and green blocks represent the clinical interpretation of the treating physician. Abbreviations: ICANS, immune effector cell-associated neurotoxicity syndrome.

- Fifteen patients were subjected to analysis. Sixty percent of these patients were male. The mean age was 63 ( $\pm 10$ ) years and six (40%) patients had a localization within the central nervous system.
- Six (40%) patients experienced ICANS grade  $\geq 2$ . The average duration of ICANS in these patients was 9 ( $\pm 3$ ) days. All these patients (100%) had an elevated DeltaScan score ( $>3$ ).
- In 83% of the cases, the elevated DeltaScan score was measured prior to the decline in the ICE score, specifically 13.1 ( $\pm 12.2$ ) hours in advance.

## Conclusion

- Early detection of ICANS in patients undergoing CAR T-cell therapy is feasible with a single-channel EEG recording.
- Elevated DeltaScan score preceded a diminished ICE score and the occurrence of ICANS. This implies that the DeltaScan score can predict ICANS.
- The ongoing study is expanded into a multi-center study.

## Contact

## References