Effectiveness of Remote Patient Monitoring in Enabling Outpatient Step-Up Dosing for Bispecifics at a Large Academic Cancer Center in the USA

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Key Takeaway

This real-world study demonstrates the feasibility of initiating Tec/Tal SUD in an OP setting utilizing RPM and prophylactic tocilizumab to reduce rates and severity of CRS, and healthcare resource utilization.

Conclusions

Prophylactic tocilizumab prevented CRS in patients initiating Tec/Tal SUD in an OP setting utilizing RPM.

RPM enabled safe OP-SUD of Tec/Tal by identifying CRS events and escalating for appropriate care in a timely manner, thus reducing healthcare resource utilization.

Introduction

- Teclistamab (Tec) and talquetamab (Tal) are first-in-class bispecific T-cell engaging antibodies approved in the USA for the treatment of adult patients with relapsed/refractory multiple myeloma (RRMM).[1,2]
- Per US label, treatment with Tec and Tal is initiated using step-up dosing (SUD) with recommended pre-treatment medications in an inpatient (IP) setting to mitigate the risk of cytokine release syndrome (CRS) and immune effector cell-associated neurotoxicity syndrome (ICANS).[1,2]
- In real-world practice, institutions are transitioning to outpatient (OP) SUD for Tec/Tal initiation to reduce healthcare resource utilization (HCRU) and allow access of these novel treatments to a broader patient population.
- Remote patient monitoring (RPM) during OP-SUD may enable timely detection of CRS to help improve patient safety.[3]
- The aim of this study was to evaluate the safety outcomes and HCRU of patients with RRMM initiating Tec/Tal SUD in an OP-RPM setting at the Memorial Sloan Kettering Cancer Center (MSKCC) in the USA.

Methods

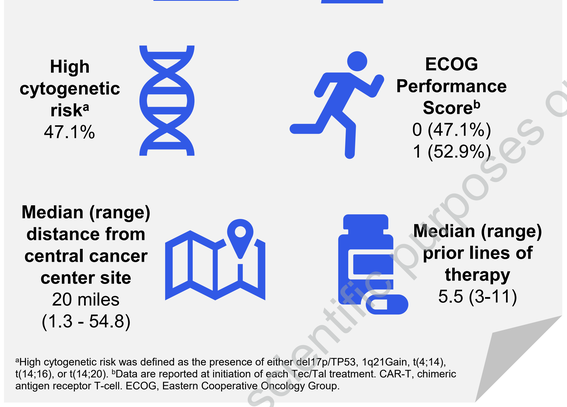
- This was a retrospective, observational study including adult patients with RRMM who initiated Tec/Tal in an OP-RPM setting between May 2024 and October 2025.
  - The institutional protocol was amended in December 2024 to administer prophylactic tocilizumab 8 mg/kg for CRS before the first SUD for all patients initiating Tec/Tal in the OP-RPM setting.
- To be selected for OP-RPM, patients were required to have a caregiver, stay <1.5 hours of the central cancer center site, and have an Eastern Cooperative Oncology Group performance status of 0-1.
- Patients with high disease burden, cognitive or neurological impairments, or complex comorbidities were not eligible for this study.
- Patients were provided with prophylactic acetaminophen and dexamethasone, and wearable RPM devices that captured continuous pulse rate, oxygen saturation, respiratory rate from the upper arm, continuous temperature from the axilla, and intermittent blood pressure (4 times per day).
- Patient status was assessed by an independent practitioner during virtual appointments (on treatment days + 2 days after each SUD)
- If CRS signs/symptoms developed and could not be resolved by acetaminophen and dexamethasone, patients returned to MSKCC's urgent care center for CRS treatment and received care in an observation unit for up to 72 hours, as needed.
- Results were summarized descriptively.

Results

Patient and Clinical Characteristics

- This study included 17 patients with RRMM that had received 18 Tec/Tal treatments in an OP-RPM setting (Tec=12, Tal=6; one patient received both Tec and Tal, separately; **Figure 1**).
- Most patients treated with Tec/Tal in an OP-RPM setting were White (70.6%) and male (64.7%).
- Patients were previously treated with chimeric antigen receptor T-cell therapy (61.1%), other bispecific antibodies (33.3%), and antibody-drug conjugates (11.1%).

Figure 1: Key Patient and Clinical Characteristics of Study Cohort (n=17)



[a]High cytogenetic risk was defined as the presence of either del17p/TP53, 1q21Gain, t(4;14), t(14;16), or t(14;20). [b]Data are reported at initiation of each Tec/Tal treatment. CAR-T, chimeric antigen receptor T-cell. ECOG, Eastern Cooperative Oncology Group.

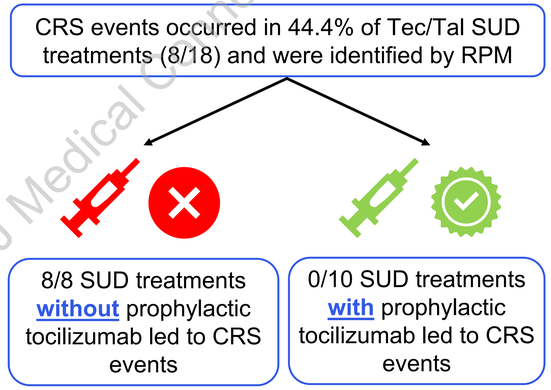
SUD Characteristics

- Most (n=16, 88.9%) OP-SUD treatments initiated with RPM were completed
  - Twelve SUD treatments were completed entirely in the OP setting
  - Four SUD treatments were completed in the OP+IP setting [three Tec-related and one non-Tec/Tal-related adverse events]
  - Two OP-SUD treatments initiated with RPM were not completed: one patient was hospitalized for non-Tec/Tal-related reasons per physician and one patient refused IP care for Grade 1 CRS.

Adverse Events During SUD

- During SUD, CRS events occurred in 44.4% (8/18) of treatments with Tec/Tal (**Figure 2**), all of which were Grade 1 and were identified via RPM.
- Prophylactic tocilizumab was administered during 10/18 treatments (55.6%) with Tec/Tal, and none had a CRS event.

Figure 2: CRS Events During SUD of Tec/Tal in an OP Setting (n=18)



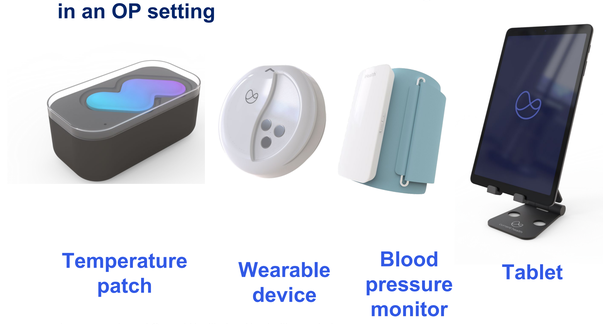
CRS, cytokine release syndrome. RPM, remote patient monitoring. SUD, step-up dosing.

- Three patients who experienced CRS were hospitalized:
  - One patient developed pneumonia and acute kidney injury
  - One patient developed infection
  - One patient had concurrent Grade 2 ICANS
- CRS events were treated with either dexamethasone alone (2/8; 25.0%), tocilizumab alone (1/8; 12.5%) or both (4/8; 50.0%).
  - One CRS event was not treated with dexamethasone or tocilizumab and SUD was not completed due to patient non-compliance.
- Two patients had recurrent Grade 1 CRS (SUD was not completed due to non-compliance and acute kidney injury).
- Two patients had concurrent CRS and ICANS, one experienced Grade 2 ICANS and was hospitalized. No recurrence of ICANS was observed
- No ICANS events were observed in patients who received prophylactic tocilizumab.
- No patients discontinued SUD of Tec/Tal due to CRS/ICANS

RPM Characteristics

- RPM devices used in this study are shown in **Figure 3.**
- Patients wore the RPM device for a median of 8.6 (interquartile range [IQR]: 7.6 -10.6) days during the SUD period.

Figure 3: RPM Devices Utilized During SUD of Tec/Tal in an OP setting



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- Median adherence to the wearable RPM device was 87.4% (IQR: 80.4 - 92.7%) in this study.
- Alarms were triggered for eight patients who required care for CRS (**Table 1**), which led to appropriate same day intervention at urgent care clinics (n=4) and hospitals (n=3), whilst one patient declined IP care.

Table 1: Alarms Triggered by RPM During Tec/Tal SUD

	RPM Alarm Triggered (N=8)
AE triggering the alarm needing clinical escalation	Grade 1 CRS
Action taken	Patient sent to urgent care/ hospital

One patient had an alarm triggered for CRS but declined IP care. AE, adverse event. CRS, cytokine release syndrome.

Healthcare resource utilization during SUD

- All-cause hospitalizations occurred in four (22.2%) Tec/Tal OP-RPM treatments, resulting in 77.7% reduction in hospitalization compared to the IP SUD administration model.
  - One hospitalization was not related to Tec/Tal administration.
- Among patients who completed SUD, three cases of hospitalization during the SUD period resulted in a median length of hospital stay of 5 days (range: 2-6).

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