Modeling Time Toxicity in Relapsed/Refractory Multiple Myeloma: A Comparative Analysis of Treatment-Related Patient Burden

PCR186

Ulrike Sager, Dietmar Aßmann, Bastian Hatesuer
Oncopeptides GmbH

CONCLUSION

Time toxicity varies substantially across therapies used in relapsed/refractory multiple myeloma from fourth-line therapy onward. The highest modelled time burden was observed for bispecific antibody regimens, largely driven by step-up dosing, monitoring requirements, and frequent healthcare contacts. Low-frequency regimens were associated with lower modelled time toxicity. These findings suggest that treatment-related time burden may be an important additional consideration in shared decision-making, particularly for patients in whom minimizing healthcare interactions is a relevant treatment goal. Future real-world analyses are needed to evaluate the impact of adverse events, unplanned healthcare utilization, and patient-specific factors on overall time toxicity.

BACKGROUND

Time toxicity, defined as the time patients spend receiving treatment or interacting with the healthcare system, is increasingly recognized as a patient-centered outcome in oncology[1,2]. In relapsed/refractory multiple myeloma, particularly from fourth-line therapy onward, treatment options differ substantially with respect to route of administration, visit frequency, monitoring requirements, hospitalization needs and additional healthcare contacts[3]. However, systematic comparisons of treatment-related time burden across commonly used late-line regimens remain limited.

METHODS

A deterministic model was developed to estimate treatment-related time burden associated with commonly used regimens in ≥4th-line RRMM, based on treatment pathways and assumptions derived from the respective SmPCs and published literature.[4] Model inputs included planned visit frequency, duration of administration, monitoring requirements, and travel time. In the absence of real-world data, a standard travel time of 30 minutes per one-way trip was assumed. Results were normalized to a 12-week treatment period (84 days). Outcomes were reported as total hours of time toxicity, equivalent full days of time toxicity, number of healthcare contacts, and days without physical contact with the healthcare system (“home days”).

Travel time

Round-trip travel for each healthcare contact

- Standardized 30 min per trip

Administration time

Time for pre-medication and administration

- IV injection
- SC injection
- oral

Observation Time

Post-administration monitoring

- Routine observation
- Step-up dosing monitoring
- Post-infusion monitoring

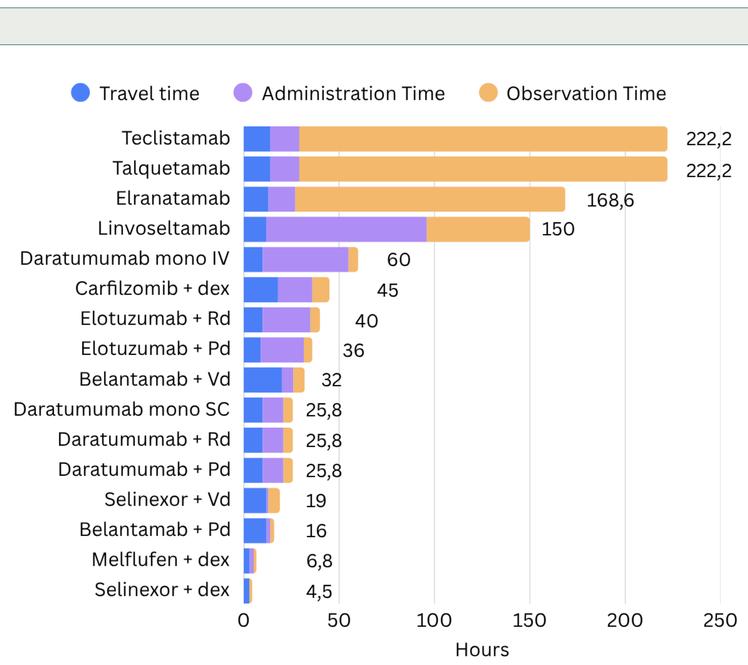
Inpatient time

Hospital stay (if applicable)

- Step-up dosing
- CRS / ICANS monitoring
- Other inpatient stay

RESULTS

- Modelled time toxicity varied markedly across selected ≥4L RRMM regimens. The highest time burden was estimated for bispecific antibody regimens: Teclistamab and Talquetamab each required 222.2 hours, corresponding to 9.3 full days and 14 healthcare contacts over 12 weeks, while Elranatamab required 168.6 hours, corresponding to 7.0 full days and 13 healthcare contacts.
- Intermediate modelled time toxicity was observed for several parenteral or combination regimens, including Daratumumab IV with 60.0 hours, Carfilzomib + Dexamethasone with 45.0 hours, Elotuzumab + Rd with 40.0 hours and Belantamab + Vd with 32.0 hours over 12 weeks.
- The lowest time burden was observed for low-frequency regimens, including Selinexor + Dexamethasone with 4.5 hours, Melflufen + Dexamethasone with 6.8 hours, and Belantamab + Pd with 16.0 hours over 12 weeks.
- Further investigation should focus on patient-individual differences as well as time toxicity arising from treatment-related side effects.



In late-line RRMM, treatment regimens differ not only in efficacy and safety profiles, but also in the amount of time patients spend receiving care. Modelled time toxicity may therefore support more patient-centered shared decision-making.

Figure 1. Total modelled time toxicity over 12 weeks. Horizontal stacked bars show the estimated treatment-related time burden and the contribution of travel time, administration or treatment time and observation or monitoring time to total estimated time toxicity. For bispecific antibody regimens, observation and monitoring time contributed substantially to total time burden, reflecting step-up dosing and monitoring requirement



Figure 2. Days without planned healthcare contact during 12 weeks of treatment. The proportion of days without planned healthcare contact ("Home Days") was calculated for each treatment regimen over a standardized 12-week period. Green segments indicate time spent outside the healthcare system, whereas red segments indicate days requiring planned healthcare contact. Each segment corresponds to three calendar days. This measure complements total time toxicity by illustrating the impact of treatment schedules on patients' daily lives and independence.

ACKNOWLEDGEMENTS

CONTACT **ulrike.sager@oncopeptides.com**

REFERENCES

1) Gupta A, Eisenhauer EA, Booth CM. The Time Toxicity of Cancer Treatment. *J Clin Oncol.* 2022;40(15):1611-1615

2) Gupta A et al. Evaluating the time toxicity of cancer treatment in the CCTG CO.17 randomized clinical trial. *J Clin Oncol*. 2022 ASCO Annual Meeting Abstract 248.

3) Mohan M et al. The impact of current therapeutic options on the health-related quality of life of patients with relapsed and/or refractory multiple myeloma. *J Cancer Surviv.* 2023

4) Engelhardt M et al. Das blaue Buch. Chemotherapie-Manual Hämatologie und Onkologie. *Springer* 8. Auflage

MED-DE–2600001, v1, Nov 2026

Presented at ISPOR 2026