Prophylactic Tocilizumab During Bispecific Antibody Step-Up Dosing in Relapsed/Refractory Multiple Myeloma: CRS Mitigation, Low-Dose Strategies, and Outpatient Feasibility

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INTRODUCTION

Bispecific antibodies are increasingly used for relapsed/refractory multiple myeloma (RRMM), but step-up dosing remains operationally challenging because of cytokine release syndrome (CRS), immune effector cell-associated neurotoxicity syndrome (ICANS), and monitoring requirements. Tocilizumab is commonly used after CRS develops; however, several centers have adopted prophylactic administration to reduce CRS and facilitate safer treatment initiation.

AIM

To evaluate the emerging evidence for prophylactic tocilizumab administered during bispecific antibody step-up dosing in RRMM, focusing on CRS mitigation, low-dose strategies, and the feasibility of outpatient implementation.

METHOD

We performed a structured review and evidence map of original studies reporting CRS outcomes after prophylactic tocilizumab during bispecific antibody step-up dosing in RRMM. Eligible studies included BCMA- or GPRC5D-directed bispecific antibodies; reviews were used for background only. Extracted variables included bispecific agent, tocilizumab dose and timing, inpatient vs. outpatient setting, comparator use, CRS, ICANS, hospitalization, additional CRS-directed therapy, and response when reported.

CONCLUSIONS

Early data suggest prophylactic tocilizumab may reduce CRS severity and support outpatient bispecific antibody step-up dosing in carefully selected RRMM patients.

Evidence remains limited by nonrandomized design, institutional selection criteria, variable dosing strategies, and limited prospective data on ICANS, infections, efficacy, and healthcare utilization.

Multicenter prospective studies are needed to define optimal dose, timing, and patient selection.

RESULTS

Three original studies identified:

- standard-dose prophylaxis, low-dose prophylaxis, and outpatient implementation.
- Standard-dose cohort (n=119, 8 mg/kg tocilizumab before first step-up dose): any-grade CRS 10.1% (teclistamab 8.9%, elranatamab 12.5%, linvoseltamab 0%, talquetamab 13%); grade 2 CRS 1.7%; no grade ≥3 CRS; ICANS 5.9% (grade ≥3, 2.5%); ORR 65.7%.
- Low-dose cohort (tocilizumab 4 mg/kg): lower CRS vs. historical controls (21% vs. 55%); grade 2 CRS 2% vs. 21%.
- Outpatient cohort (n=52): CRS 19.2%, ICANS 5.8%, hospitalization for toxicity management 7.7%.

Strategy	N	Tocilizumab Dose	Any-grade CRS	Grade ≥2 CRS
Standard-dose (real-world)	119	8 mg/kg x1, pre-step-up	10.1%	1.7%
Low-dose	—	4 mg/kg	21% (vs 55% hist.)	2% (vs 21% hist.)
Outpatient implementation	52	Prophylactic (site-defined)	19.2%	—

Table 1. CRS outcomes across the three identified prophylactic tocilizumab strategies.

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REFERENCES

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