



CRP levels as a predictor of allogeneic transplant outcomes

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Lia Minculescu and colleagues from [Copenhagen University Hospital Rigshospitalet](#) in Denmark conducted a retrospective study of allogeneic transplant patients to investigate whether C-reactive protein (CRP) levels drawn at time of graft-versus-host disease (GvHD) diagnosis can predict resistance to steroid therapy.

CRP is a protein made by the liver, which is released into the bloodstream as a response to tissue injury, infection or other inflammatory triggers. The study hypothesis is that co-existing causes of inflammation may aggravate GvHD. The study investigated both risk factors for development of GvHD and risk factors for development of steroid-refractory GvHD (SR-GvHD).

Key Findings:

- N = 461 total patients observed
 - Acute GvHD (aGvHD): 44%
 - Chronic GvHD (cGvHD): 49%
 - SR-GvHD: 6%
- Risk factors for GvHD grade II–IV
 - Age >53 years old vs < 53 years old: Odds Ratio (OR) = 0.67 (95% CI, 0.45–1.00), $P = 0.05$
 - Non-myeloablative prep regimen vs myeloablative: OR = 0.54 (95% CI, 0.36–0.8), $P = 0.02$
 - High-intensity (12 Gy) total body irradiation (TBI) vs other: OR = 0.35 (95% CI, 0.23–0.53), $P = 0.001$
 - Peripheral blood stem cell product vs bone marrow, OR = 0.63 (95% CI, 0.41–0.98), $P = 0.04$
- CRP levels at GvHD diagnosis
 - Liver: 104 mg/L (9–195)
 - Skin: 36 mg/L (0–223)
 - GI: 60 mg/L (0–253)
- Risk factors for SR-GVHD
 - Grade II vs III GVHD: OR = 0.05 (95% CI, 0.02–0.14), $P = <0.001$
 - Lack of visceral involvement: OR = 0.21 (95% CI, 0.09–0.51), $P = 0.05$
 - CRP >10: OR = 1.5 (95% CI, 1.18–1.93), $P = 0.001$
 - Patient age, preparatory regimen, TBI, donor-recipient gender mismatch, and graft source were not found to impact risk of SR-GvHD

- 5-year transplant related mortality (TRM) 50% greater if CRP >10 vs <10, $P = 0.002$
- GvHD-related mortality in SR-GvHD patients: 57.1%

This study showed that elevated CRP levels are associated with increased SR-GvHD and 5-year TRM rates. Grade III and visceral GvHD involvement also increased the risk of SR-GvHD. These are important indices that can help identify patients at highest risk of initial treatment failure to quickly navigate those patients toward second-line therapies.

References

1. Minculescu L. *et al.* C-Reactive Protein Levels at Diagnosis of Acute Graft-Versus-Host Disease Predict Steroid-Refractory Disease, Treatment-Related Mortality, and Overall Survival after Allogeneic Hematopoietic Stem Cell Transplantation. *Biology of Blood and Marrow Transplantation* 2018; 23(3): 600-607.

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