Allogeneic Hematopoietic Stem Cell Transplantation (alloSCT) is considered an effective, potentially curative treatment for Acute Myeloid Leukemia (AML) and Myelodysplastic Syndrome (MDS). Although, successful outcomes in patients are dependent on various factors ranging from pre-existing co-morbidities, the age of the patient and the immunosuppressive therapies employed.

According to Andrew S. Artz, of the University of Chicago Medicine, and colleagues, the effects of patient related factors on morbidity and Transplant Related Mortality (TRM) has become more important in determining the success of a transplant. However, there are other variables that are analyzed in order to ascertain the probability of a positive outcome. For example, Artz et al. state that impaired performance status interferes with the success of a transplant and they also report that comorbidity determined by the Hematopoietic Cell Transplantation-Comorbidity Index (HCT-CI) predicts for worse survival largely through higher TRM.

However, Artz et al. believe that there is a need for simpler and more objective prognostic markers that can accurately predict TRM. There have been some studies that have indicated elevated C-Reactive Protein (CRP), ferritin and lower albumin prior to alloSCT may act as suitable biomarkers, although the results were variable.

Consequently, Artz et al. conducted a study to validate the independent prognostic value of pre-conditioning serum CRP, ferritin and albumin in 784 patients with AML in remission or MDS. Their analysis was based on registry data and was published in *Haematologica* in November 2016.

Their key published findings were the following:

- 50% greater risk of TRM, independent of clinical factors, was predicted by the protocol-specified thresholds of CRP (>10mg/L \(P = .008\)) and albumin (<3.5g/dL \(P = .01\))
- Hypoalbuminemia was strongly associated with inferior survival \(P = .002\) whereas CRP only showed borderline significance \(P = .072\)
- Ferritin in excess of 2,500ng/mL did not increase the risks of TRM or impair survival

The investigators concluded that albumin and pre-transplant CRP both independently predicted for greater TRM. However, this was not the case for high ferritin levels. Moreover, they affirmed that further investigation is required to validate this new biomarker risk score based on optimal thresholds for ferritin, CRP and albumin on higher risks of TRM and inferior survival.

**Abstract**
We sought to confirm the prognostic importance of simple clinically available biomarkers of C-reactive protein, serum albumin, and ferritin prior to allogeneic hematopoietic cell transplantation. The study population consisted of 784 adults with acute myeloid leukemia in remission or myelodysplastic syndromes undergoing unrelated donor transplant reported to the Center for International Blood and Marrow Transplant Research. C-reactive protein and ferritin were centrally quantified by ELISA from cryopreserved plasma whereas each center provided pre-transplant albumin. In multivariate analysis, transplant-related mortality was associated with the pre-specified thresholds of C-reactive protein more than 10 mg/L (P=0.008) and albumin less than 3.5 g/dL (P=0.01) but not ferritin more than 2500 ng/mL. Only low albumin independently influenced overall mortality. Optimal thresholds affecting transplant-related mortality were defined as: C-reactive protein more than 3.67 mg/L, log (ferritin), and albumin less than 3.4 g/dL. A 3-level biomarker risk group based on these values separated risks of transplant-related mortality: low risk (reference), intermediate (HR=1.66, P=0.015), and high risk (HR=2.7, P<0.001). One-year survival was 74%, 67% and 56% for low-, intermediate- and high-risk groups. Routinely available pre-transplant biomarkers independently risk-stratify for transplant-related mortality and survival.

References


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