

Dissociation of Relative Thrombocytosis Associated with Higher ESA Dose vs. Hemoglobin Levels in Hemodialysis Patients

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INTRODUCTION

- Recent randomized controlled trials indicated increased thromboembolic events and mortality upon targeting higher **hemoglobin** levels using higher doses of erythropoietin stimulating agents (ESA).
- Platelet** reactivity plays a central role in the genesis of thrombosis and thromboembolic events especially in atherosclerotic cardiovascular disease that is the leading cause of death in patients with chronic kidney disease.
- Relative thrombocytosis is associated with worse nutrition profile and higher death risk in maintenance hemodialysis patients.
- We, hence, examined the association of the latter 2 factors with relative thrombocytosis (increased platelet count), which is a predictor of increased thromboembolic events and death.

METHODS & RESULTS

- Using linear regression models, we separately examined the associations between ESA dose and hemoglobin levels with 13-week (calendar quarter) averaged platelet count during July to Dec 2001 in a cohort of 40,697 maintenance hemodialysis patients from all DaVita Inc. clinics.
- Patients were 60±15 yrs old and included 47% women, 46% diabetics and 34% African Americans. The 3-mo averaged creatinine prior to transplant was 10.6±3/2 mg/dL.
- Unadjusted, and case-mix adjusted models, incrementally higher hemoglobin levels were associated with lower platelet count, whereas incrementally higher ESA doses were associated with higher platelet count (see Figure 1).

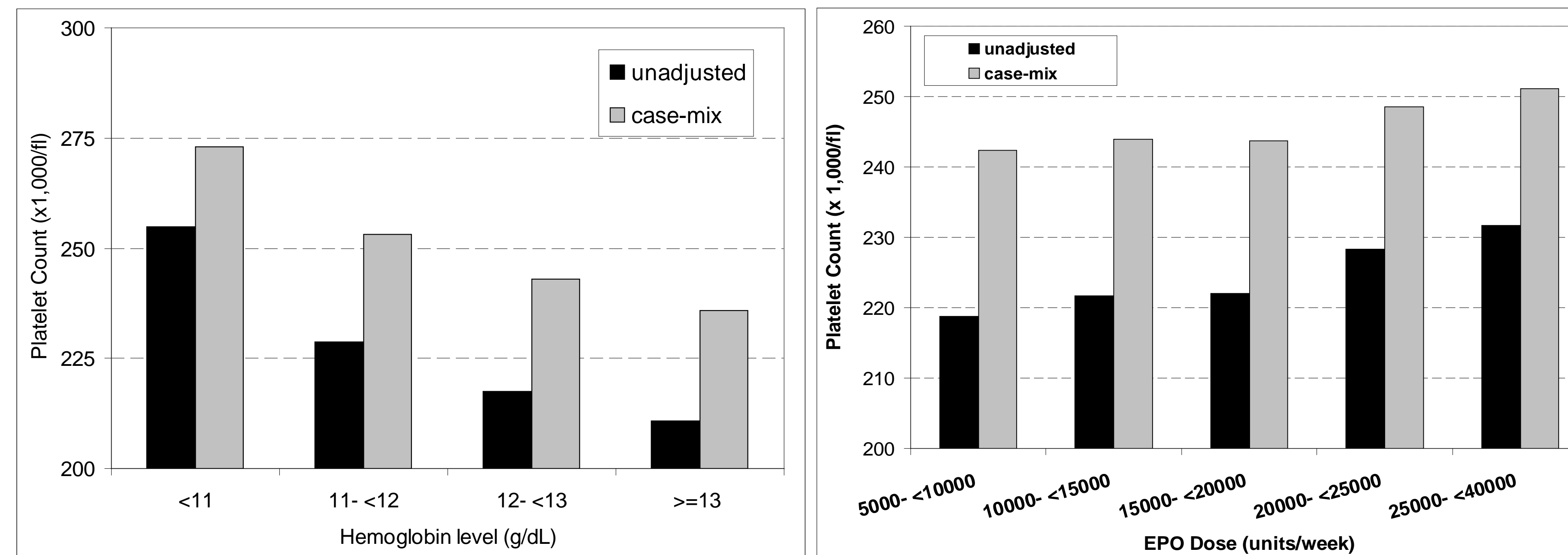


Figure 1. Association between blood hemoglobin and EPO dose and predicted platelet count using unadjusted and case-mix adjusted analysis of linear regression models.

CONCLUSIONS

- Our findings in dialysis patients support the longstanding observation that platelet counts are statistically increased in patients with evidence of inflammation. The biologic significance, if any, of a platelet increase of this magnitude is unclear.

KEY LEARNINGS

- ✓ Higher platelet count was incrementally associated with lower hemoglobin levels, but higher ESA doses.
- ✓ These observations suggest that high ESA and higher achieved hemoglobin may not be equated.
- ✓ These observations suggest a potential explanation for the dissociation of higher ESA dose and poor outcomes
- ✓ Trials to examine mortality via increasing platelet pathway are needed.

We thank the patients who participated in this study and DaVita Clinical Research® (DCR) for grant funding and support in preparing this poster. DCR is committed to advancing the knowledge and practice of kidney care.

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