Life imitates art far more than art imitates life—Oscar Wilde, “The Decay of Lying”

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Jerry Garcia from The Grateful Dead.

The investigators from this study have harvested data from a large registry comprising patients from Virginia and North Carolina. They have focused on a clinical dilemma that cardiac surgery teams face on a daily basis. Notably, none of us are comfortable with the inevitable iatrogenic anemia that accompanies cardiac surgery, but neither are we entirely sure that transfusion is risk free, and is the cure worse than the disease?

I don't underestimate the task that the researchers have undertaken to apply convincing analytic techniques to tease out this answer from observational data. It is undoubtedly hard to separate the 2 factors of anemia and transfusion, because they are intimately intertwined. In the end, LaPar and colleagues¹ have come to the conclusion that transfusions are more closely associated with negative outcomes than the absolute hematocrit. The resulting tale of the danger of transfusions has been a theme of other investigators who have analyzed large observational trials, and so their message adds to the strong call of caution to all of us to refrain from unnecessary red blood cell transfusions.

Regardless of the size of the registry sample and the rigor of their analysis, unfortunately I remain unconvinced that the authors have answered the question they set out to address. Probably the most important factor that leads me to hedge my bet relates to the data from cardiac surgery randomized controlled trials that support that there really are not a lot of differences in the incidence of complications between those who do and do not receive transfusions. “Life imitates art” comes to mind in this situation because registry data are close to “life” and well-designed clinical trials are constructed “art” of medical behavior. In my mind, I have to reconcile the findings of LaPar and colleagues¹ with those of Mazer and colleagues,² and it is not an easy path. In the randomized controlled trials, transfusion does not seem to be associated with more problems than doing nothing. On the other hand, there are compelling data that anemia is convincingly associated with complications and that this relationship grows stronger as the level of anemia increases.³

Central Message

The ideal methods to tease out the contributions of anemia and transfusion to adverse events after cardiac surgery from observational data are still beyond our grasp.

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Statistical machinations of observational data are challenging, but what about this particular analysis gives me pause? First of all, I am not clear that the models are detailed enough with only 3 covariates (year, logit of the predicted risk of mortality/renal failure/stroke, and hematocrit or packed red cell use). Comparing the models is difficult because they are not nested, and thus it is not entirely clear that De Long's test is appropriate to say one is better than the other.

The investigators are to be commended for having recognized the importance of fixed and random effects on the outcome variables. In particular, they have indicated that the institution was included in the analysis as a random effect. We are aware that there is remarkable heterogeneity in transfusion practices across jurisdictions.⁴ On the other hand, having done the statistical legwork, it would have been interesting had the authors indicated whether taking into account this variability had improved the sensitivity of the models, as I expect it must have.

The Grateful Dead guitarist and vocalist Jerry Garcia said, “constantly choosing the lesser of two evils is still choosing evil.”⁵ No one will argue that massive unnecessary transfusion will create a health burden, but I do believe that in the larger population of cardiac surgery patients (who are not anemic preoperatively) if they receive a transfusion that amounts to an appropriate proportionate response, they are not likely harmed. They may not be

helped as much as we wish, but I'm not sure it (transfusion) is evil.

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