Hospital Transfusion Use and Infection-related Re-hospitalization Among Patients on Dialysis

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Introduction

- In response to both a new bundled payment system and an erythropoiesis stimulating agent (ESA) label revision in 2011, red blood cell (RBC) transfusion rates in patients on dialysis rose.
- Decreases in hemoglobin concentrations subsequent to ESA dose reductions are thought to have contributed to the absolute increase in the number of transfusions observed among patients on dialysis recently.
- Although RBC transfusions are used widely in the US and around the world every year, providers must carefully weigh the benefits and risks of the procedure before each administration.
- Transfusions have been associated with adverse outcomes, including infection and cardiovascular and neurologic complications, especially in patients with critical conditions or undergoing cardiac surgery.
- Data describing the risk of infection associated with RBC transfusions in patients on dialysis is scant; understanding this risk will help providers, including hospitals and dialysis centers, better understand and assess the risk-benefit proposition for anemia management using RBC transfusions in patients on dialysis.
- We sought to assess the association between hospital transfusion use practices and the risk of infection-related re-hospitalization and a composite endpoint (infection-related re-hospitalization or death) among patients on in-center hemodialysis.

Methods

- Using a retrospective cohort study design with 2011-2012 Medicare general Medicare data, we first calculated hospital-level adjusted odds ratios (OR) of receiving a transfusion using a mixed-effect logistic model.
- Hospitals were then categorized into quintiles of the transfusion OR distribution.
- Next we identified all patients receiving in-center HD who had an incident hospitalization event between 2012 and 2013 in the Medicare ESRD dataset.
- Using a grouped treatment approach, we used Poisson regression to estimate the association between hospital transfusion use quintile and patient-level risk of IRRH within 30 days and a composite of IRRH and death, in dialysis patients hospitalized 2012-2013, adjusting for patient demographics, comorbidities, and hospital and hospitalization characteristics.

Results

- We identified 123,554 HD patient incident hospitalizations during 2012-2013, and 2,714 hospitals.
- The probability of transfusion across quintiles of hospital groups ranged from 1.1% to 16.9% (Figure 1).
- Patient characteristics and hospitalization characteristics were generally balanced across quintiles, with the exception of race and geographic location (Table 1).
- Examining unadjusted and adjusted relative risks of IRRH or the composite of IRRH or death, hospital transfusion probability, dose-response relationships across quintiles of probability were not observed for primary or secondary outcomes (Figures 2, 3).
- We additionally conducted a patient-level analysis and observed a significant association between transfusions and IRRH within 30 days; the adjusted OR = 1.17 (95% CI 1.13-1.22).

Conclusions

- Hospital transfusion practices were not associated with an increased risk of IRRH, although patients who did receive a transfusion were more likely to be re-hospitalized.
- Additional research, possibly using an IV methodology, may be necessary to further elucidate the potential infection-related effects of blood transfusions.