Economic Burden of Anemia-Related Transfusions in Medicare Dialysis Patients

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Introduction

- Red blood cell transfusions are undesirable anemia management outcomes and current guidelines recommend avoidance of use when possible.
- As a result, avoidance of transfusions in dialysis patients is a quality measure indicated by Medicare.
- While previous studies have investigated the burden of transfusion in Medicare dialysis patients, none has investigated transfusions and their associated costs due specifically to anemia itself (that is, in the absence of acute medical indication).

Objective

To estimate Medicare spending for inpatient and outpatient transfusions administered solely to manage anemia in maintenance dialysis patients.

Methods

The United States Renal Data System (USRDS) database was used to analyze both incident and prevalent patients receiving dialysis in 2014 with Medicare part A/B coverage.

- Transfusions were identified using ICD-9-CM procedure/revenue center codes.
- Hospitalizations were studied those with 0- or 1-day stays with anemia as the principal diagnosis and no evidence of other reasons for the hospitalization based on diagnosis, procedure, and DRG codes (see Figure 1).
- We identified outpatient, emergency department (ED), and observation stays (OBS) that appeared to be solely for transfusions using an algorithm similar to that applied to identify transfusion hospitalizations.
- We calculated total Medicare payments by identifying costs directly associated with the transfusion itself and related screening or monitoring costs in the pre- (day 3 to day 1) and post- (day 1 to day 3) period, and post-transfusion-related complications.

Results

Table 1. Characteristics of patients with anemia-related transfusions

Table 2. Selection of patients and identification of transfusions

Figure 2. Timeline of the estimation of Medicare paid costs for anemia-related transfusions.

Figure 3. Study design scheme identifying hospitalizations whose main purpose was an anemia treatment.

Conclusions

- We identified 5669 transfusions associated with anemia in the absence of other acute illness ($74,347 million) in 2014, 1,432 in outpatient (Table 1).
- Patients who had anemia-related transfusions in the IP or ED/OBS settings, as opposed to other outpatient settings were more likely younger and of black race (Table 2).
- Total Medicare payments for these transfusions were $13.78 million, $7.37 million for IP, $3.47 million for ED/OBS, and $4.95 million for other outpatient settings.
- Inpatient transfusions accounted for 10% of total anemia-related transfusions, but for over 50% of total transfusion-related costs (Table 4).

Limitations

Costs included only those paid by Medicare.
Patient out-of-pocket or third-party costs (~15% of the total) were not considered.
For anemia-related IP transfusions, costs were limited to those accrued during a short (2-3 day) hospitalization stay, likely underestimating true costs.
Data are from 2014, and transfusion rates have declined since then.

Table 3. Medicare paid costs, total and average per transfusion, for anemia-related transfusions in patients declining in 2014.

Table 4. Setting for transfusions, N, related costs and per transfusion costs.

1. For inpatient transfusions, we calculated Medicare paid costs for dialysis hospitalization, as opposed to other non-dialysis hospitalizations.
2. For transfusions identified from our main strategy (inpatient hospitalizations) and our alternative strategy (outpatient settings), we excluded cases where claims might have been submitted for the same transfusion.
3. Total transfusions identified from our main strategy and our alternative strategy accounted for 7,498 transfusions.
4. Total transfusions identified from our main strategy and our alternative strategy accounted for 6,456 transfusions.
5. Among inpatient transfusions, we excluded cases with a cause of death of endotracheal tube, transfusion of other serum, venous catheterization for renal dialysis, or closed biopsy of kidney.