

Blood Transfusion And Length of Stay: How Are They Related?

RL Thurer, T Precopio, S Parrell, MA Popovsky. Haemonetics Corporation, Braintree, MA

Background:

The association between blood transfusion and increased length of stay (LOS) is well known. However, the nature of this relationship is complex since transfusions not only increase morbidity and consequently LOS but their frequency is also related to anemia which can be a marker for both acute and chronic disease.

Methods:

- We queried a proprietary blood management business intelligence portal (IMPACT® Online, Haemonetics, Braintree, MA) and identified 20,758 patients who had either primary unilateral total hip or total knee replacement. 418 patients were eliminated as “outliers” because they received either >4 units of red cell transfusion and/or had lengths of stay >7 days. An additional 105 patients had incomplete data leaving 20,235 patients available for analysis.
- LOS was evaluated by lowest recorded hemoglobin during the entire hospitalization (Nadir Hgb) for both transfused and untransfused patients. Additional analysis was done for patients who either did or did not receive preoperatively donated autologous blood (PAD).

Results:

LOS was related to Nadir Hgb irrespective of transfusion status. Within each group of Nadir Hgb (except <7 g/dL), patients who received allogeneic blood had longer LOS than those who did not. Patients who received PAD (n=1179) had both longer LOS (3.50 vs. 3.07 days) and higher allogeneic transfusion rates (27.1% vs.17.3%) than those who did not receive PAD.

Nadir Hgb (g/dL)	Patients	LOS (days) All Patients	Patients Transfused Allogeneic RBC / %	LOS (days) Transfused Patients	Untransfused Patients	LOS (days) Untransfused Patients
<7	222	4.18	159 / 71.6	4.13	63	4.30
7-7.9	1643	3.73	1026 / 62.5	3.76	617	3.70
8-8.9	4466	3.32	1701 / 38.1	3.48	2765	3.22
9-9.9	5483	3.12	488 / 8.9	3.38	4995	3.09
10-10.9	4333	2.97	89 / 2.1	4.06	4244	2.95
11-11.9	2428	2.70	11 / 0.5	5.18	2417	2.69
≥12	1660	2.49	28 / 1.7	3.89	1632	2.46
Total	20235	3.09	3502 / 17.3	3.60	16733	2.98

Conclusions:

- The increased LOS that is often attributed to transfusion is at least in part due to an association between anemia and LOS that is independent of transfusion status.
- Since LOS is related to Nadir Hgb, strategies such as treatment of preoperative anemia, improved surgical hemostasis and cell salvage are valuable ways to minimize LOS and associated costs.
- PAD was not effective in either shortening LOS or reducing allogeneic transfusion rate.