



Impact of Postoperative Anemia and Transfusion in Patients Undergoing Complex and Fenestrated-Branched Endovascular Aortic Repair

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Background

- Anemia in patients undergoing Endovascular Aneurysm Repair (EVAR) is associated with negative outcomes
- The benefits and optimal threshold for RBC transfusion in patients undergoing fenestrated-branched EVAR (FB-EVAR) has not been well defined

Objective

- To evaluate the impact of postoperative anemia and transfusion on patients undergoing complex and FB-EVAR

Methods

- Design: Retrospective cohort analysis
- Database: Society for Vascular Surgery Vascular Quality Initiative
- Inclusion: complex or FB-EVAR with 1 or more viscerorenal vessels
- Study period: 2014 – 2020
- Cohorts: Hemoglobin (g/dL) <7, 7-8, 8-9, 9-10, >10
- Stratification: RBC transfusion status (yes vs no)
- Primary outcome: MACE (myocardial infarction, heart failure, dysrhythmia, stroke)
- Secondary outcomes: in-hospital mortality, 1-year survival

Table 1. Postoperative outcomes for each preoperative Hgb group by transfusion status

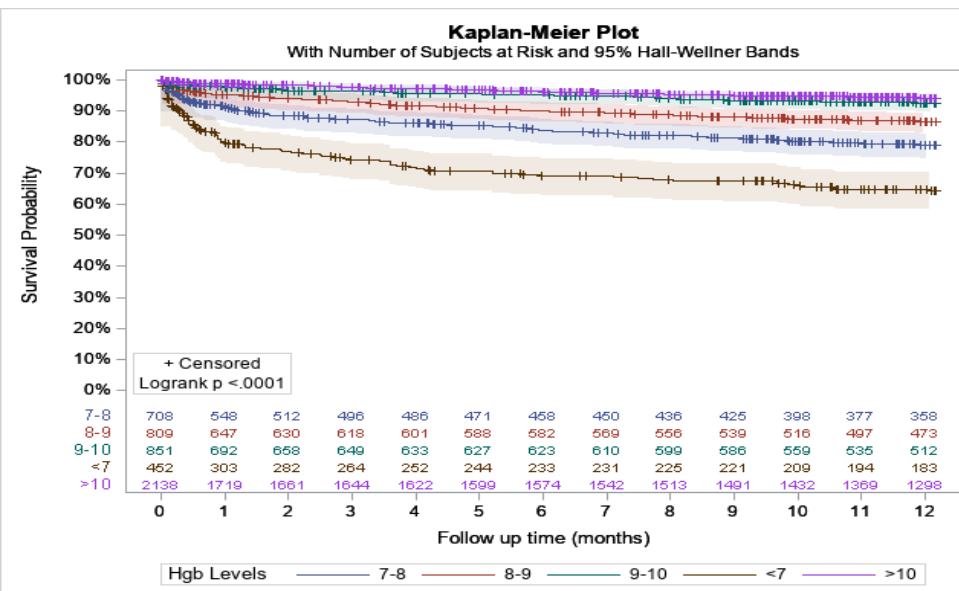
Hgb group (N)	Hgb <7 (452)		P-value	Hgb 7-8 (708)		P-value	Hgb 8-9 (809)		P-value	Hgb 9-10 (852)		P-value	Hgb >10 2145		P-value
Transfusion	Yes	No		Yes	No		Yes	No		Yes	No		Yes	No	
MACE	33%	16%	.048	23%	14%	.008	19%	6%	<.0001	14%	7%	.0006	13%	3%	<.0001
In-hospital mortality	17%	9%	.33	8%	3%	.04	8%	1%	<.0001	6%	1%	<.0001	5%	0.3%	<.0001
1-year survival	66%	78%	.267	78%	84%	.058	79%	91%	<.0001	85%	94%	<.0001	86%	95%	<.0001

Table 2. Multivariable logistic regression for MACE

Hgb level	Odds Ratio	95% CI	P-value
<7	2.5	1.7 – 3.7	<.0001
7-8	2.0	1.4 – 2.9	.0002
8-9	1.5	1.03 – 2.08	.036
9-10	1.4	1.0 – 2.03	.047
>10	Ref		

Table 3. Cox proportional hazards model for 1-year mortality

Hgb level	Odds Ratio	95% CI	P-value
<7	3.2	2.2 – 4.6	<.0001
7-8	2.1	1.5 – 3.0	<.0001
8-9	1.8	1.3 – 2.4	.0006
9-10	1.2	0.8 – 1.7	.37
>10	Ref		



Conclusions

- Receiving a blood transfusion following FB-EVAR is associated with increased MACE for each postoperative nadir hemoglobin <10 g/dL and increased mortality for nadir hemoglobin 7-10 g/dL
- These findings suggest that rather than attenuating the negative effects of anemia, transfusion is itself associated with worse higher rates of MACE and lower 1-year survival.