

Association Between Blood Product Transfusion and Development of Hospital Acquired Infections or Mortality in Patients Admitted to the Hospital Wards. A Retrospective Case-Control Study

Arunmozhi Aravagiri M.D., Ayutyanont Napatkamon, PhD, Sabhyata Sharma M.D., Timothy Collins, M.D., Chimezie Ubbaonu, M.D., Hoveda Mufti, M.D.

HCA Healthcare; Riverside Community Hospital, Riverside, CA; University of California, Riverside, CA

Introduction

Transfusion of blood products has been shown to be associated with increased mortality and risk of infections in critically ill patients and following cardiac surgery [1-2]. However, there is scarce data evaluating this association in patients admitted to hospital wards. Here we seek to see if transfusion of blood products carries the same risk of infection and mortality in more stable patients.

Methods

This was a retrospective case-control study of patients admitted to the internal medicine wards who received packed red blood cells (PRBC), fresh frozen plasma (FFP) or platelet transfusions, using data from the HCA Healthcare administrative database from 2016 to 2019 (table 1). Patients admitted with an infection, on steroids or other immunosuppressant medications were excluded. ICD-10 codes at discharge were used to determine HAI. Odds ratios and 95% confidence intervals were calculated (table 2). Primary outcome of study was presence of HAI, while secondary outcome was mortality in transfused vs. non-transfused patients.

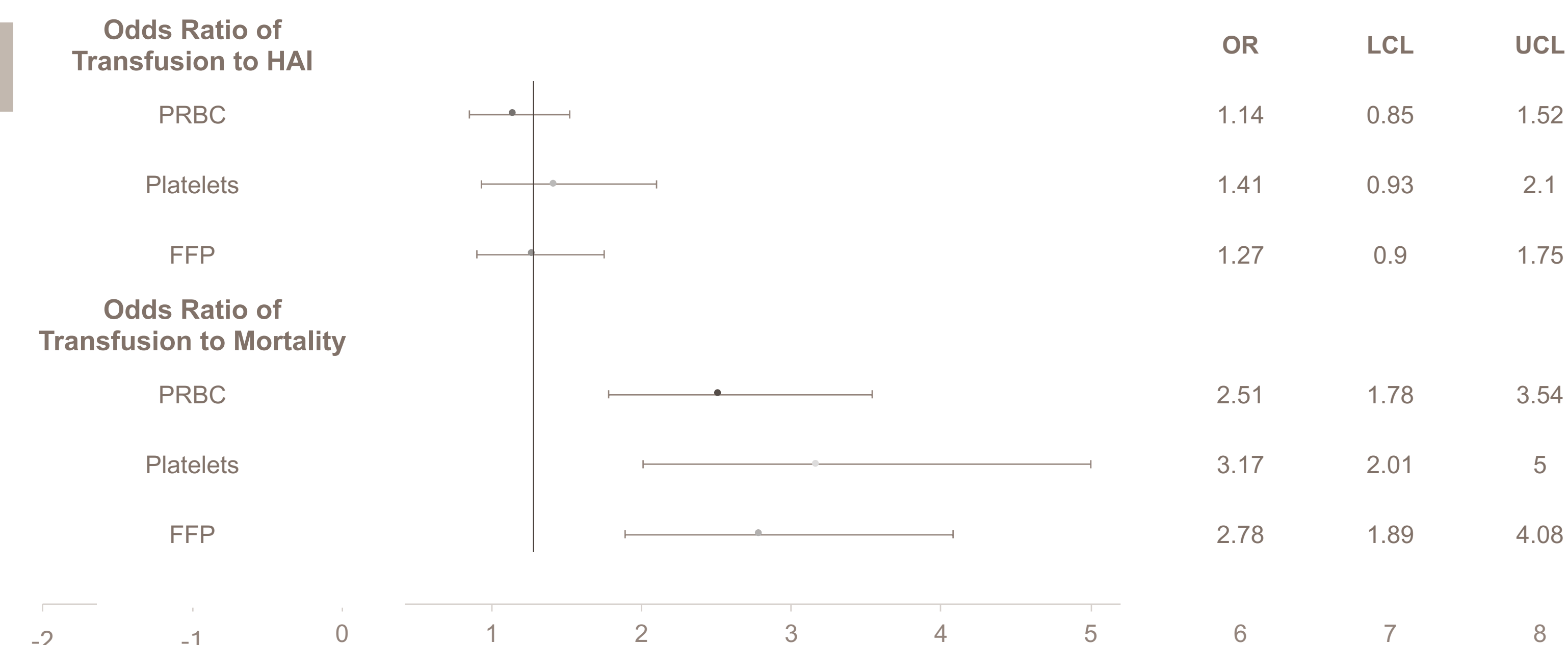


Figure 1: Forrester plot of odds ratios of primary and secondary end points including 95% confidence intervals

	Transfused	Not Transfused
Total N (%)	1628 (83.4)	324 (16.6)
Female	701 (35.9)	169 (8.7)
Male	927 (47.5)	155 (7.94)
NHB	191 (9.8)	62 (3.2)
NHW	1221 (62.6)	205 (10.5)
Hispanic	105 (5.4)	43 (2.2)
Non-Hispanic	1523 (78.0)	281 (14.4)
Mortality	494 (25.3)	56 (2.9)
HAI	560 (28.7)	93 (4.8)

NHB: Non-Hispanic African American, NHW: Non-Hispanic Caucasian, HAI: Hospital associated infection

Table 1: showing study population demographics

	OR (95% CI)	P-value
HAI		
PRBC	1.14 (0.85 to 1.52)	0.372
Platelets	1.41 (0.93 to 2.1)	0.0978
FFP	1.27 (0.9 to 1.75)	0.1748
Mortality		
PRBC	2.51 (1.78 to 3.254)	< 0.0001
Platelets	3.17 (2.01 to 5)	< 0.0001
FFP	2.78 (1.89 to 4.08)	< 0.0001

Table 2: showing primary and secondary end points with p-values.

Results

A total of 1952 subjects were included in the study analysis. Of these, 653 or 33.4% had a HAI during their admission. Adjusted multivariable model showed transfusion of PRBCs, platelets, or FFP was not associated with increased odds of having a HAI. The multivariable model, however, did show an increase in odds of mortality in patients who were transfused with above blood products compared to non-transfused.

Conclusion

Our data failed to show association between transfusion of blood products and HAI. However, it showed there was significant increase in mortality in patients that had received blood products during their admission

References

- 1) Platelets Is Associated With Mortality and Infection After Cardiac Surgery in a Dose-Dependent Manner. *Anesth Analg.* 2020;130(2):488-497. doi:10.1213/ANE.0000000000004528
- 2) Ripollés Melchor J, Casans Francés R, Espinosa Á, et al. Restrictive versus liberal transfusion strategy for red blood cell transfusion in critically ill patients and in patients with acute coronary syndrome: a systematic review, meta-analysis and trial sequential analysis. *Minerva Anesthesiol.* 2016;82(5):582-598.