Abstract:

The objectives of this study were, therefore, to evaluate, using systematic review and meta-analysis, the effects of transfusion on hemodynamic/oxygenation variables in patients without acute bleeding” Cavalcante dos Santos et al (2020).

Objectives: RBC transfusions can increase oxygen availability to the tissues, but studies have provided conflicting results. The objectives of this study were, therefore, to evaluate, using systematic review and meta-analysis, the effects of transfusion on hemodynamic/oxygenation variables in patients without acute bleeding.

Data Sources: PubMed, Scopus, Cochrane Database of Systematic Reviews, and Embase from inception until June 30, 2019.

Study Selection: All articles that reported values of prespecified hemodynamic or oxygenation variables before and after RBC transfusion.

Data Extraction: Publication year, number of patients, number of transfusions and the type of population studied, hemodynamic and oxygenation data (heart rate, cardiac index, mixed
venous oxygen saturation or central venous oxygen saturation, oxygen delivery index, oxygen consumption index, oxygen extraction ratio, arteriovenous oxygen difference and arterial blood lactate) before and after transfusion. We performed a meta-analysis for each variable for which there were sufficient data to estimate mean differences. We also performed subgroup analyses comparing septic with nonseptic patients.

Data Synthesis: We retrieved 6,420 studies; 33 met the inclusion criteria, 14 of which were in patients with sepsis. In the meta-analysis, the estimated mean differences and 95% CIs comparing the periods before and after transfusion were -0.0 L/min/m² (-0.1 to 0.1 L/min/m²) (p = 0.86) for cardiac index; -1.8 beats/min (-3.7 to 0.1 beats/min) (p = 0.06) for heart rate; 96.8 mL/min/m² (71.1–122.5 mL/min/m²) (p < 0.01) for oxygen delivery index; 2.9% (2.2–3.5%) (p < 0.01) for mixed venous oxygen saturation or central venous oxygen saturation; -3.7% (-4.4% to -3.0%) (p < 0.01) for oxygen extraction ratio; and 4.9 mL/min/m² (0.9–9.0 mL/min/m²) (p = 0.02) for oxygen consumption index. The estimated mean difference for oxygen consumption index in the patients with sepsis was 8.4 mL/min/m² (2.3–14.5 mL/min/m²; p = 0.01).

Conclusions: Transfusion was not associated with a decrease in mean cardiac output or mean heart rate. The increase in mean oxygen delivery following transfusion was associated with an increase in mean oxygen consumption after transfusion, especially in patients with sepsis.

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