A155 - Effects of erythrocyte transfusion on hemodynamic and oxygen metabolism: cross-sectional study of paired series

A Trifi 1; A Mehdi 2; H Fazzeni 2; F Daly 2; Y Touil 2; S Abdellatif 2; S Ben Lakhal 2
1La Rabta hospital, Medical intensive care unit., Tunis, Tunisia, 2La Rabta hospital, Tunis, Tunisia

Introduction:
Erythrocyte transfusion (ET) is a common practice in ICUs. While it can save lives in hemorrhagic shock, its efficacy is more uncertain in moderate anemia of inflammatory origin. There is still considerable debate about the risks / benefits and indications of transfusion of ET in patients with non-haemorrhagic anemia. We aimed to study the effects of ET on hemodynamic and oxygen metabolism.

Methods:
Comparative cross-sectional study on matched series before / after ET. Patients receiving ET for non-hemorrhagic anemia (Hb <7 g / dL) were eligible. Ultrasound Cardiac output (CO), arterial and central venous blood gas were performed before and 2h after transfusion. Blood Formula Count (BFC) was collected 24 hours after ET. All hemodynamic and O2 metabolism parameter’s (using the following formulas: arterial O2 content (CO2, ml / dl) = 1.34 (ml / g) x Hb (g / dl) x SO2 + [(0.0031 x PO2 (mm Hg))] and Oxygen delivery (DO2, ml / min) = CO (l / min) x CO2 x 10) and hematologic were compared before/after ET by paired samples

Results:
20 patients were included of 43 years as median age and median SOFA = 6. The median Hb indicating ET was 6.6 [6.2-6.9]. After transfusion of 1 RBC pellet: CO2 (ml / dl) increased from 8.9 [8.5-9.3] to 10.4 [9.4-11.3] with p <10^-3. CO (l / min), and DO2 (ml / min) decreased but did not reach significance: CO: 5.6 [4.4 -7.01] vs 4.6 [3.8-6.7] and p = 0.33, CI: 3.2 [2.4-4.1] vs 2.4 [2.3-3, 8] and p = 0.16, OD2: 522 [402-623] vs 503 [433-666] and p = 0.17.
Haematological parameters increased (p <10^-3 for all) with a change in Hb (g / dl) from 6.6 [6.2-6.9] to 7.9 [7.02 - 8.4], hematocrit (%) of [19-22] to 24 [22-25] and GR count (106 / ml) of 2.47 [2.14-2.75] to 2, 9 [2.49 to 3.22].

Conclusion:
Our results tend to confirm that, despite the improvement of CO2 after ET, DO2 does not improve (ultimate goal of transfusion!). This effect seems to be due to the decrease of the CO consequent to the increase of blood viscosity.