

The Cardiovascular Effects of Erythrocyte Transfusion in Critically ill Children

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Introduction: There are many studies concerning that limited erythrocyte transfusion strategy decreases the mortality and organ insufficiency however studies about oxygen delivery to the tissues are rare in number. In our study we aimed to evaluate the effects of erythrocyte transfusion on tissue oxygen delivery and cardiovascular system in acute phase.

Material and Methods: Patients were divided into 2 groups (Group A: Hemoglobin<7g/dl and Group B: Hemoglobin7-10g/dl) . Echocardiographic measured cardiac output, serum lactate, hemoglobin levels were recorded before transfusion. Then initial, 1st,2nd,3rd and4th hours' oxygen saturation(SpO₂), perfusion index, noninvasive total hemoglobin(SpHb), oxygen content(Spoc), heart rate and bloodpressure values were measured. Cardiac output, hemoglobin and serum lactate levels were repeated also after finishing transfusion.

Results: Seventytwo cases were included in the study (40 female,32 male). Mean age was 63,3± 57 months. Hemoglobin levels of 22 cases were <7g/dL and the rest of 50 cases were between 7-10g/dL idi. Median hemoglobin values in Group A was 7,9±0,78g/dl, in Group B was 6,12±0,65g/dl. 44 patients had mechanical ventilation support; 5 of those were in Group A, rest 39 of them were in Group B. The ones without mechanic ventilation support: 11cases were in Group B, 17 were in Group A. The level of hemoglobin that was required for tranfusion was 7,8±1,1g/dl for the ones had mechanical support and 6,8±0,9 g/dl for the others that didnot have ventilation support. It was significantly high in ventilation group(p<0,001).

In each group cardiac output, noninvasive hemoglobin(SpHb), oxygen content (Spoc), serum lactate levels were measured pre and posttransfusion. There was a significant increase after transfusion (p<0,01,p<0,01,p<0,01,p=0,009). But perfusion index was significantly increased in Group A(p<0,01). **Conclusion:**Limited transfusion strategy had positive effects on microcirculation and cardiovascular system. Also when adverse effects of liberal transfusion were considered, limited transfusion was the right transfusion model.