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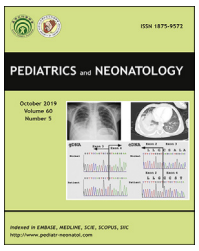

Editorial

Transfusion-related immunomodulation in pediatric patients

Blood transfusion is a common and important intervention in pediatric clinical practice, especially for patients with critical illnesses, hematologic diseases, and malignancies. However, it is also widely known that transfusion can lead to a variety of immunological consequences. Moreover, transfusion-related immunomodulation (TRIM) has been an evocative organizing principle in transfusion medicine for more than 40 years. On one hand, substantial reports of TRIM stemmed from the observation that blood transfusion was associated with a lower incidence of rejection in patients receiving renal transplantation, suggesting an immunosuppressive effect of blood transfusion.[1] On the other hand, several studies have also attributed a number of potential proinflammatory effects to transfusion.[2] These contradictory findings can be explained by blood product-specific, host-related, and other contextual influences at the time of transfusion.[3]

In addition, remarkable advances have been made in blood banking practices, over the last decade, including the adoption of prestorage leukoreduction program. Nevertheless, along with a variety of complex factors among patients, it is difficult to discuss about the epidemiology and pathophysiology of TRIM. Therefore, the following narrower but more specific definition of TRIM has been proposed "The concept of TRIM focuses on determining whether there are specific, well-defined immunosuppressive effects from transfusing pure red blood cells (RBCs) themselves, along with the by-products produced from the stored RBCs as a result of the storage lesion."[4] Accordingly, several potential immunological consequences of blood transfusion that can be observed in patients receiving transfusion but are not considered to represent TRIM, include infectious consequences, anaphylactic reactions, graft-versus-host disease, and blood group alloimmunization-induced hemolysis.

Nonetheless, the conflation of immunological effects and inflammatory effects can often be difficult to separate in patients receiving transfusion. Additionally, many cytokines can also affect both the immune and inflammatory response. A study conducted by Mohsen et al. focusing particularly on the positive correlation between IL-8 concentrations in the packed RBC bags and posttransfusion serum IL-8 levels revealed no significant differences between pre and posttransfusion serum IL-8 levels in preterm infants.[5] Moreover, the findings suggested that the elevated IL-8 levels might be from the packed RBC bags, and, therefore, the authors concluded that there was no evidence of TRIM in preterm infants. Hence, an interesting and important issue arose in this study: "TRIM does not occur in premature infants?" As we have known, the development of immunity in premature infants may not be well-established, and premature infants generally have complicated clinical conditions. In addition, TRIM is difficult to define in premature patients than in adults. Thus, randomized studies with larger sample size to evaluate more biologically active molecules are required in order to elucidate this issue.

Conflicts of interest

The authors declare no conflicts of interest.

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