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Editorial

Blood transfusion—rational use

Transfusión sanguínea – uso racional

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Blood transfusion is a strategy used often for therapeutic purposes and, occasionally, for preventive purposes in different hospital settings. There is no doubt about its value in various clinical circumstances, as it improves oxygen transport capacity. However, there is an ever increasing number of research reports showing that this form of therapy entails multiple risks for the patient, which is why its rational use is required.

In the past, the most feared complications were the transmission of infectious diseases and hemolytic reactions arising from ABO incompatibilities. However, with the development of laboratory techniques and the design of protocols for blood donations and transfusions, their frequency has been reduced significantly and patient safety has improved considerably.

Today, although a minor risk of infection and major hemolytic reaction still persists, there is a potential for a number of other adverse effects including allergic reactions, transfusion-related acute lung injury (TRALI), late hemolytic reactions, circulatory overload reaction, metabolic disorders such as hypocalcemia and hyperkalemia, altered immunomodulation leading to increased susceptibility to infection, a higher risk of cancer recurrence, and the possibility of reactivating latent viruses in the patient.¹⁻³ All these potential risks require decisions supported clearly by careful evaluation of the effectiveness of this therapy that will serve as a guide to physicians working in different areas as to when transfusion of different blood products is indicated.

In his review article, "Transfusion in Trauma", Dr. González Cárdenas presents an overview of the management of massive bleeding associated with trauma, and discusses in part the evidence available from studies of massive transfusion as a management strategy for these patients.⁴ Although evidence about the most adequate combination of blood products to

use, the clinical and paraclinical variables that best define the time for initiating the transfusion, or the volume to transfuse is not conclusive at the present time⁵, the author mentions the potential role of thromboelastography in guiding the decision for administering platelets and fresh plasma in cases of massive transfusion, based on literature studies. Moreover, he points to the need for designing practical evidence-based clinical guidelines as a better way to drive this set of decisions.⁴

The risk of several adverse effects associated with transfusion is related to red blood cell storage time because of the release of pro-inflammatory substances, the reduction of 2,3-diphosphoglycerate levels, and the subsequent increase of packed red blood cell hemoglobin affinity for oxygen, resulting in reduced oxygen delivery to the transfused tissues. Additionally, there is a reduction of nitric oxide levels, which may alter vasodilatation in response to hypoxia and ATP levels. All these alterations appear to be associated with an increased risk of dying, the risk of infection, the prolongation of mechanical ventilation, and the risk of renal failure in critically ill patients.⁶

In his reflection on "Storage injury and blood transfusion", Dr. Aristizabal highlights these risks and points to the need for a conservative approach to the use of blood transfusions, in accordance with the recommendations of the recent literature.⁷

The frequency of use of thromboelastography has increased in different clinical situations, in particular during cardiovascular surgery and major orthopedic surgery, in order to spot coagulation disorders in all their phases and components, and in order to guide the use of blood products. It was incorporated for intraoperative use by the American Society of Anesthesia in 2006,⁸ and it has become a resource

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of undeniable value to guide the decision of administering blood products, not only during surgery but as part of the preoperative preparation of the patients, and to follow up on coagulation disorders during the post-operative period and in some critically ill patients.⁸

In the case report entitled "Thromboelastography as a guide for transfusional therapy in a patient with Turner's syndrome, aortic arch hypoplasia and aortic coarctation undergoing aorthoplasty using the 'sliding technique', Dr. Pérez Pradilla et al., refer to the value of this diagnostic test for the transfusional management of a female pediatric patient undergoing cardiac surgery with a high risk of bleeding.^{9,10}

In summary, blood transfusion is a necessary therapeutic tool in clinical practice; however, it is important to rationalize its use in order to minimize the risks it entails. In multiple situations, thromboelastography guides decision-making for a more rational use of some blood products, but there is a need to have additional evidence, not only about the usefulness of this diagnostic technique but about other aspects related to the effectiveness and the right time to transfuse red blood cells.

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Conflict of interests

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