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What is the best way for a blood bank to manage immune-hematological interference related to Daratumumab treatment?

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Hemostasis, transfusion medicine, vascular, laboratory medicine, benign hematology

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Introduction: Daratumumab treatment can produce artefacts in pre-transfusion tests, which makes difficult to identify anti-erythrocyte antibodies that are relevant for transfusion. Its use is increasing, primarily in the treatment of multiple myeloma. There are two options for avoiding immune hemolytic transfusion reactions. Either select red cell concentrates (RCC) that are at the least incompatible with common antigens known to be harmless, or use pre-analytical techniques to eliminate artefacts, such as treating the test red blood cells or the patient's serum. According to a previous evaluation in our laboratory, treating test red blood cells with trypsin and dithiothreitol (DTT) enables the search for common antibodies to be completed in 97% of cases. However, this method needs about three hours of work. The aim of this study is to evaluate whether this approach is justified for a proper management of a blood bank.

Methods: We examined transfusion records of all patients having received daratumumab treatment at our hospital. All of them received transfusions after undergoing complete pre-transfusion testing to exclude all current and dangerous antibodies. We examined the immunization rate, the average number of transfusions and the number of immuno-hematological workup after the start of daratumumab treatment.

Results: Between January 2016 and September 2025, we detected four cases (2%) of new alloimmunization among 194 patients treated with daratumumab. Ten patients were alloimmunized, six of whom were already carriers of an alloantibody prior to commencing daratumumab treatment (Figure 1). The average number of immune-hematological workup after the start of treatment and the average number of transfusions per patient were 4.7% and 5.65 respectively (Figure 2). The number of pre-transfusion testing was 920 and 1074 red cell concentrates could be transfused without selecting the less incompatible product.

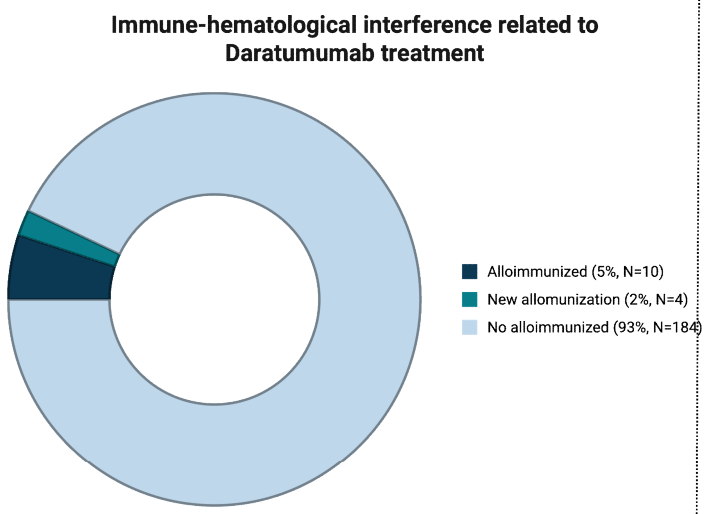

Figure 1

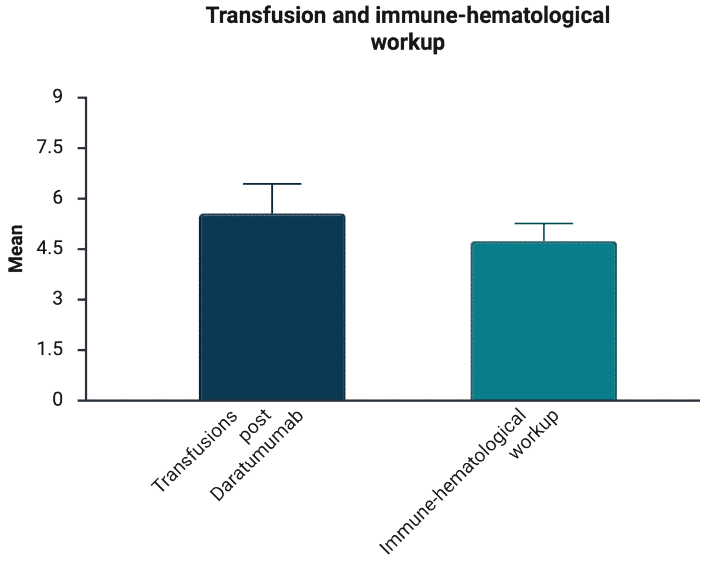

Figure 2

Conclusion: Only 2% of patients experienced alloimmunization after starting daratumumab treatment This rate is notably much lower than that of sickle cell patients. Efforts to perform complete pretransfusion testing, allows selection of RCC according to the ''type & screen'' concept instead of choosing the less incompatible product (RH, KEL, FY, JK, MNS). This allows the preservation of precious blood resources for patients at high risk of alloimmunization, such as sickle cell patients, or already alloimmunized patients.

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