

Antonio Fabron Junior  
Gilberto Moreira Junior  
José Orlando Bordin

## Delayed hemolytic transfusion reaction presenting as a painful crisis in a patient with sickle cell anemia

Universidade Federal de São Paulo/Escola Paulista de Medicina, São Paulo, Brazil

### ABSTRACT

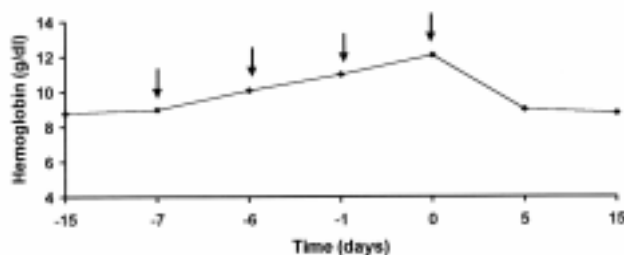
**Context:** Patients with sickle cell anemia (SCA) are frequently transfused with red blood cells (RBC). Recently, we reported that the calculated risk of RBC alloimmunization per transfused unit in Brazilian patients with SCA is 1.15%. We describe a delayed hemolytic transfusion reaction (DHTR) presenting as a painful crisis in a patient with SCA.

**Case report:** A 35-year-old Brazilian female with homozygous SCA was admitted for a program of partial exchange transfusion prior to cholecystectomy. Her blood group was O RhD positive and no atypical RBC alloantibody was detected using the indirect antiglobulin technique. Pre-transfusional hemoglobin (Hb) was 8.7 g/dL and isovolumic partial exchange transfusion was performed using 4 units of ABO compatible packed RBC. Five days after the last transfusion she developed generalized joint pain and fever of 39°C. Her Hb level dropped from 12.0 g/dL to 9.3 g/dL and the unconjugated bilirubin level rose to 27 mmol/L. She was jaundiced and had hemoglobinuria. Hemoglobin electrophoresis showed 48.7% HbS, 46.6% HbA<sub>1</sub>, 2.7% HbA<sub>2</sub>, and 2.0% HbF. The patient's extended RBC phenotype was CDe, K-k+, Kp(a-b+), Fy(a-b-), M+N+s+, Le(a+b-), Di(a-). An RBC alloantibody with specificity to the Rh system (anti-c, titer 1:16.384) was identified by the indirect antiglobulin test. The Rh phenotype of the RBC used in the last packed RBC transfusion was CcDEe. The patient was discharged, asymptomatic, 7 days after admission.

**Key Words:** Sickle cell anemia. Transfusion reaction. Painful crisis.

### INTRODUCTION

Red blood cell (RBC) transfusions are widely used in the management of patients with sickle cell anemia (SCA). We reported recently that the calculated risk of RBC alloimmunization per transfused unit in Brazilian patients with SCA is lower than that reported by studies from North America (1.15 vs. 3.10%), reflecting a more concordant RBC phenotype between blood donors and recipients in Brazil.<sup>1,2</sup> Therefore, we have not been routinely performing extended RBC phenotyping on all SCA patients prior to initiating a transfusion program. Nevertheless, in the present report we describe the occurrence of a delayed hemolytic transfusion reaction (DHTR) presenting as a painful crisis in a patient with SCA in Brazil.



**Figure 1** - Delayed hemolytic transfusion reaction presenting as a sickle cell crisis in a Brazilian patient with sickle cell anemia. The arrows indicate the packed RBC units transfused.

## CASE REPORT

A 35-year-old Brazilian female with homozygous SCA was admitted for a program of partial exchange transfusion prior to cholecystectomy. Her blood group was O RhD positive and no atypical RBC alloantibody was detected using the indirect antiglobulin technique. Pre-transfusional hemoglobin (Hb) was 8.7 g/dL and isovolumic partial exchange transfusion was performed using 4 units of ABO compatible packed RBC. Figure 1 shows the serial Hb levels in relation to the blood transfusion program. Five days after the last transfusion she developed generalized joint pain and fever of 39°C. Her Hb level dropped from 12.0 g/dL to 9.3 g/dL and the unconjugated bilirubin level rose to 27 mmol/L. She was jaundiced and had hemoglobinuria. Hemoglobin electrophoresis showed 48.7% HbS, 46.6% HbA<sub>1</sub>, 2.7% HbA<sub>2</sub>, and 2.0% HbF.

The patient's extended RBC phenotype was CDe, K-k+, Kp(a-b+), Fy(a-b-), M+N+s+, Le(a+b), Di(a-). An RBC alloantibody with specificity to the Rh system (anti-c, titer 1:16.384) was identified by the indirect antiglobulin test. The Rh phenotype of the RBC used in the last packed RBC transfusion was CcDEe. The patient was discharged, asymptomatic, 7 days after admission.

## DISCUSSION

It has been reported that the prevalence of DHTR in patients with SCA ranges from 0.7 to 4%.<sup>2,3</sup> Moreover, there are few published reports of cases in which the development of DHTR presents as a painful crisis.<sup>2,4</sup> Although the RBC alloimmunization rate among multitransfused Brazilian patients with SCA is lower than previously reported rates in the United States,<sup>1,2</sup> the present case illustrates that DHTR occurs and can easily be mistaken for a painful sickle cell crisis, even in countries with low antigen mismatching between blood donors and SCA

recipients. Interestingly, in contrast to the fact that about 40% of the potentially hemolytic RBC alloantibodies are usually not detected even after long-term follow-up, the presence of the above-mentioned RBC alloantibody (anti-c, titer 1:16) is still demonstrable in our patient's serum 5 years after her last blood transfusion. In conclusion, this case reveals some of the problems associated with the prevention and diagnosis of DHTR in patients with SCA transfused in countries where the rates of phenotypic incompatibility between donors and recipients are low.

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From Disciplina de Hematologia e Hemoterapia da Universidade Federal de São Paulo/EPM, São Paulo, Brazil

### Authors

**Antonio Fabron Junior** - Docente da disciplina de Hematologia e Hemoterapia da faculdade de Medicina de Marília e pós-graduando da UNIFESP/EPM

**Gilberto Moreira Junior** - Médico da disciplina de Hematologia e Hemoterapia da Universidade Federal de São Paulo

**José Orlando Bordin** - Professor livre-docente da disciplina de Hematologia e Hemoterapia da Universidade Federal de São Paulo

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**Address for correspondence:**

José Orlando Bordin  
Disciplina de Hematologia e Hemoterapia  
Universidade Federal de São Paulo/EPM  
Rua Botucatu, 740  
São Paulo/SP - Brasil - CEP 04023-092

## RESUMO

**Contexto:** Pacientes com anemia falciforme recebem com frequência concentrados de glóbulos vermelhos (CGV). Recentemente, nós relatamos que o risco de alo-imunização eritrocitária por unidade transfundida em pacientes brasileiros com anemia falciforme é 1,15%. **Relato de caso:** Nós descrevemos uma reação transfusional hemolítica tardia (RTHT) apresentando-se como uma crise dolorosa em um paciente com anemia falciforme.