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Case Report

Alarmed or unalarmed!! Donor red cell lysis during plateletpheresis procedure

Daljit Kaur[a,*], Manoj Kandwal[b]

[a] Department of Transfusion Medicine, Max Superspeciality Hospital, Shalimar Bagh, Delhi 110088, India
[b] Department of Transfusion Medicine, All India Institute of Medical Sciences, Rishikesh, Uttarakhand 249203, India

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ABSTRACT

Plateletpheresis procedures are considered safe for donors and very few adverse events are reported. Donor related adverse events include hypo-calcemia due to citrate toxicity, vasovagal reactions, transient post-procedural decline in hemoglobin, hematocrit and platelet count. Kit related adverse events include damage of the kit or rarely mechanical damage of the red cells during procedure. This damage can lead to failure of the rinse-back of the red cells to the donors causing higher red cell loss in such donors. Here, we are reporting a kit related adverse event that led to donor red cell lysis during plateletpheresis procedure.

1. Introduction

The term “apheresis” refers to a group of technologies for continuously separating peripheral blood components on the basis of density and/or size [1]. Advances in apheresis have been linked to the advances in instrumentation [2]. Tullis et al first described the use of Latham blood processor for plateletpheresis in 1968 requiring frequent operator intervention for optimal outcomes [3]. Recent designs have become more automated and operator friendly and nowadays such equipments are marketed worldwide for apheresis. Usually plateletpheresis procedures are safe for donors and very few adverse events related to procedure are reported [4,5]. Hereby, we are reporting a rare case of donor red blood cell (RBC) lysis during plateletpheresis procedure.

2. Case report

A 26 years old healthy male donor with normal hemoglobin and platelet count, blood group AB RhD Positive, was first time donating apheresis platelets for a dengue patient in emergency hours. The donor was regularly working out at gym and was taking multivitamins and liver supplements. The donor signed an informed consent and was accepted for procedure after he met the plateletpheresis screening criteria as laid down by the Directorate General Health services, Ministry of Health and Family Welfare, Government of India. The single needle plateletpheresis procedure was performed by a trained and experienced operator on cell separator COM-TEC (Fresenius Kabi, Kit lot No. – FBI081, Exp. – Jan 2019), a continuous flow centrifugation system with extracorporeal volume of 285 ml. Kit installation and priming were uneventful.

The procedure was started with a single and smooth venepuncture, with a target platelet yield of 3×10^{11} and procedure time of 72 min. After 25 min of initiation of procedure, red cell contamination was observed in the platelet collection bag. Machine also alarmed for red cell contamination in plasma line and the procedure was halted. The operator followed the Operating Manual and Technical Expert instructions. As suggested, the plasma line was removed from the detector and the procedure was restarted to inspect if the plasma line got cleared. The whole blood flow rate and the anticoagulant: whole blood ratio was gradually adjusted during the procedure. Also it was decided to centrifuge the final product to get red cell free component for transfusion after serological crossmatch of donor and patient samples. But the red cell contamination continued to persist and at 54 min into the procedure, it was finally decided to abandon the procedure (Fig. 1).

When reinfusion of the remaining blood was tried, donor complained of pain and heaviness in the same arm having venepuncture. Thereafter, the reinfusion was also stopped and the donor was further advised not to donate blood for the next 3 months. Simultaneously, during reinfusion, machine alarmed for leakage and blood spillage was found in the centrifuge. Subsequently, the final product was centrifuged but no intact red cells could be separated and only hemolyzed red cells were present (Fig. 2).

The same night, around 2 h post procedure, the donor passed bloody urine. Donor was referred to the nephrologist for further management and was advised to hydrate himself maximally. On the next morning, he passed clear urine. The serum and urine investigation results are listed

* Corresponding author.
E-mail addresses: doc.daljit@gmail.com, daljit.kaur@maxhealthcare.com (D. Kaur).

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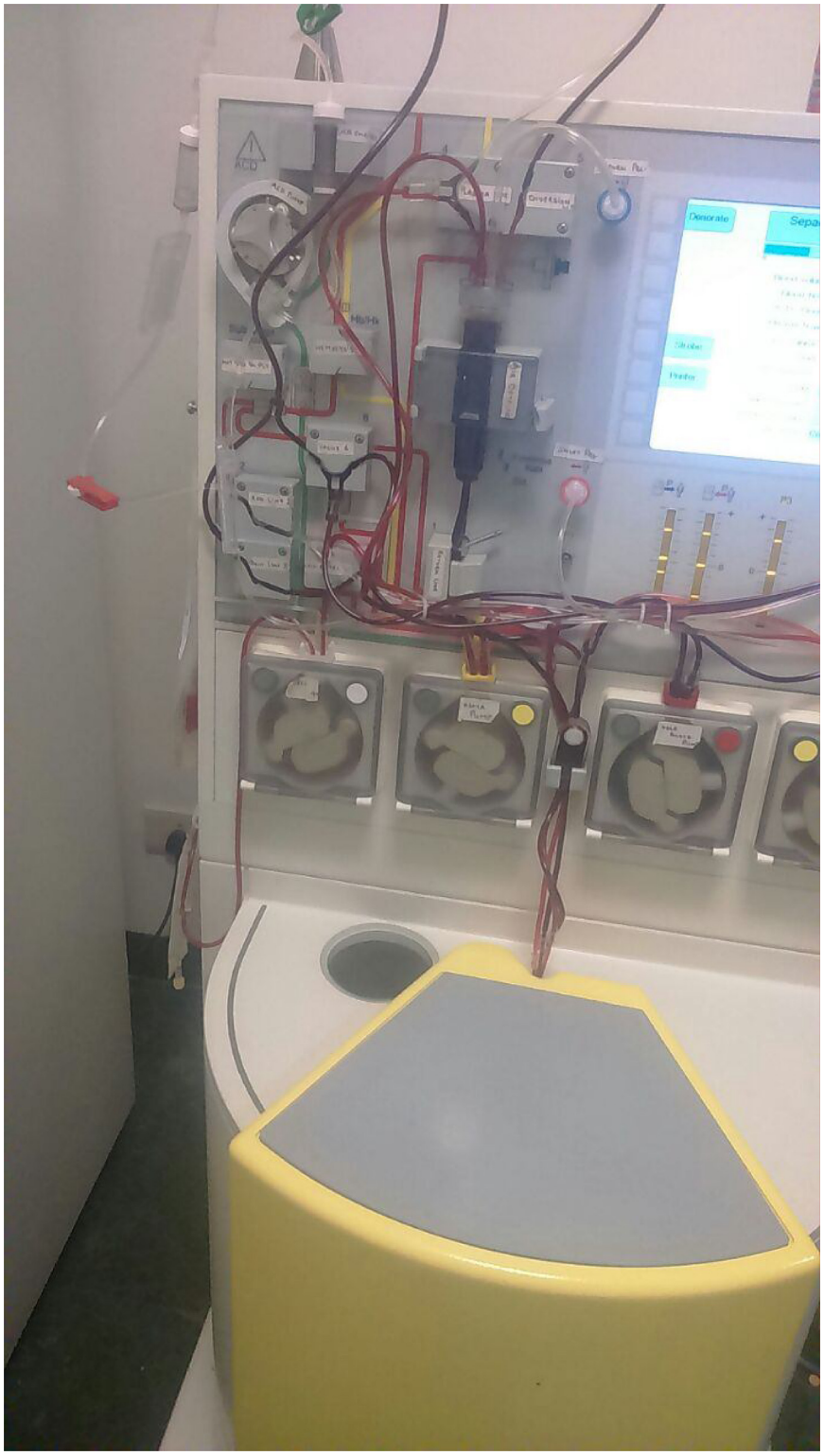

Fig. 1. Hemolysis seen in the plasma line during plateletpheresis procedure.

in Table 1.

Donor was interviewed for any previous history of bleeding tendencies, hemolysis, blood transfusion or autoimmune disease and was found satisfactory. The probability of the intrinsic red blood cell defects were ruled out once the hemolytic episode was over by performing red blood cell morphology, osmotic fragility test, presence of autoantibody, Glucose-6 phosphatase dehydrogenase (G6PD) screen, direct antiglobulin test and indirect antiglobulin tests. All the tests resulted as normal.

Nephrologist discharged the donor same day once he was hemodynamically stable and no further evidence of hemolysis was observed.

3. Discussion

Once the donor related concerns for hemolysis were addressed and found satisfactory, the kit and machine related issues were assessed to