

CAPA Analysis of Haemolysed Red Cell Unit Detected During Component Preparation: Importance of Quality Check on Cold Chain Maintenance

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Dear Editor,

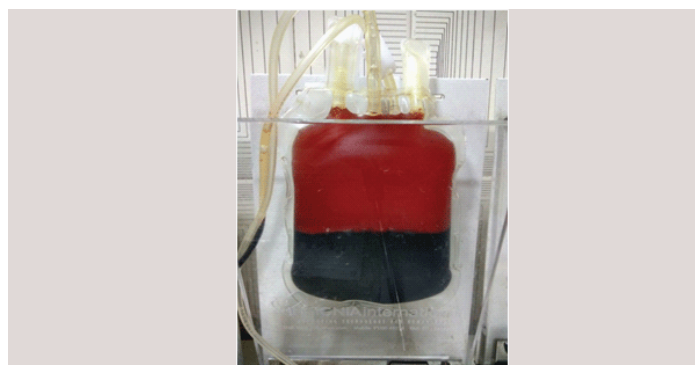
Haemolysis in a red cell unit is caused by the breakdown of the RBC, causing release of haemoglobin and resulting in the discoloration of the plasma. Abnormal haemolysis in an RBC unit may be caused by inappropriate handling during collection, transportation, processing of blood, inappropriate storage conditions, bacterial haemolysins, antibodies or RBC membrane defects [1].

Temperature is one of the main factors causing haemolysis [1]. The temperature variations outside the defined temperature affect membrane deformability and therefore the stability of the membrane during processing leading to haemolysis [2]. The glucose metabolism is increased with higher temperatures resulting in loss of red cell viability [3].

We came across a blood unit collected from a camp which showed gross haemolysis during component preparation [Table/Fig-1]. The bag was segregated and quarantined. The speed of centrifugation was rechecked and found to be appropriate. As the centrifuge

receives regular maintenance check and is calibrated quarterly and only one unit of the whole batch was haemolysed, therefore haemolysis due to centrifuge errors was ruled out. On Corrective and Preventive Action (CAPA) analysis, it was found that red cell unit was prepared from a WB donation from a 33-year-old first time male donor with the weight 70 kg, who completed the donation process in 10 minutes. All the transport boxes with the ice packs were rechecked and one of the transport boxes had frozen ice packs and a perforated plastic sheet which we use as a layer between the ice pack and blood bag was missing. Two more blood bags from the same transport box were also found haemolysed. Culture of 1% of red cell units was sterile. The use of perforated plastic sheet as an insulated layer in between frozen ice packs and blood was reinforced with successful outcome.

An important step in the packing procedure is to assure that the topmost layer is wet ice (not in direct contact with blood) or a cold pack to keep warm air from making contact with blood bags. The second critical element is to be certain that the shipping container is completely filled so that outside air is nearly eliminated. In boxes shipped long distances or at high environmental temperatures, the volume of ice should at least equal that of the blood [4].



[Table/Fig-1]: The haemolysed unit of blood.

REFERENCES

- [1] Sowemimo-Coker SO. Red blood cell haemolysis during processing. *Transfus Med Rev.* 2002;16(1):46-60.
- [2] Sawant RB, Jathar SK, Rajadhyaksha SB, Kadam PT. Red cell haemolysis during processing and storage. *Asian J Transfus Sci.* 2007;1(2):47-51.
- [3] Hess JR, Solheim BG. Red cell metabolism and preservation. In: Simon TL, Snyder EL, Solheim BG, Stowell CP, Strauss RG, Petrides M, editors. *Rossi's principles of transfusion medicine.* 5th ed. UK: Willey Blackwell; Pp. 106.
- [4] World Health Organization. Manual on the management, maintenance and use of blood cold chain equipment. WHO Library Cataloguing-in-Publication Data ISBN 92 4 154673 5 (NLM classification: WH 460).

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