

INTRODUCTION

- Leucoreduction is the process of reducing the concentration of white blood cells.
- The need for LR arises because the viable leucocytes in the blood components and their inflammatory mediators are linked to a wide variety of acute and delayed transfusion complications.
- The leucocytes present in the transfused blood components, with their specific allogenic structure having the human leucocyte antigen (HLA) class I and class II on their surface are the main targets of the recipient’s immune system. They can present antigens to the recipient and evoke the formation of antibodies against them resulting in HLA alloimmunisation leading to platelet refractoriness and graft rejections.

AIMS AND OBJECTIVES

- To estimate the percentage leucoreduction obtained with each method of leucoreduction.
- To estimate the quality parameters in the red cell concentrate leucoreduced by buffycoat method and filtration.
- To determine the better method of leucoreduction by comparing percentage leucoreduction and red cell recovery.

METHODS AND MATERIALS

- In this study, we performed 3 methods of leucoreduction - Prestorage filtration, Poststorage filtration and Buffy coat removal.
- Buffy-coat reduction of the 20WB collected in the 450 ml TAB blood bags were performed on the day of collection using the T-ACE II+ automatic component extractor system. Leucofiltration was performed with Leucolab Maco Pharma filter and quality parameters were analysed in 40 SAGM suspended RCCs, which was divided into 20 prestorage and 20 poststorage. In our study, Automatic cell counter was used for counting the residual leucocytes in the leucofiltered RCCs.
- They filtered the RCCs by gravity immediately after component separation in prestorage LR and in poststorage LR, filter the RCC by removing them from storage before issue to recipients.

REFERENCES

- Meryman HT, Bross J, Lebovitz R. The preparation of leukocyte-poor red blood cells: a comparative study. Transfusion. 1980 Jun;20(3):285–92
- Brittingham TE. Febrile Transfusion Reactions Caused by Sensitivity to Donor Leukocytes and Platelets. JAMA. 1957 Oct 19;165(7):819

RESULTS

QUALITY PARAMETERS	PRE STORAGE LR		POST STORAGE LR		BUFFYCOAT REMOVA L	
	PRE LR	POST LR	PRE LR	POST LR	PRE LR	POST LR
Volume change (ml)	309	303	328.1818	321.2727	477.6364	283.8182
Absolute red cell count (10*9)	2138	1990.545	2344.455	2065.273	2126.727	1743.455
Hb content (gm)	54.63636	52	56.50231	54.09091	61.18182	56.72727
Hematocrit (%)	59.45455	56.37273	60.59091	56.72727	65.13636	61.1
Absolute Leucocyte count (10*6)	3338	0.580909	3974.636	2.718182	3277.727	862.6364
Red cell recovery (%)	-	93.10316	-	88.09182	-	81.97829

DISCUSSION

- In Buffy-coat reduction, Post-procedure absolute leucocyte count is 862.6364X10*6, We achieved 99.7% leucoreduction with a red cell recovery of 81.978%.
- In Prestorage Leucofiltration, Post-procedure absolute leucocyte count is 0.5809X10*6.We achieved 99.999% leucoreduction with red cell recovery of 93.10316%.
- In Poststorage Leucofiltration, Post-procedure absolute leucocyte count is 2.7181X10*6, 99.999 % leucoreduction with a red cell recovery of 88.09182% was observed

CONCLUSION

- All 3 methods achieve leucoreduction in the red cell units to a variable extent, while the efficiency to reduce leucocyte content was found to be more with filtration. The current generation leucofilter is shown to achieve 99.99% leucoreduction, bringing down the leucocyte content in the filtered red cell units to < 1 × 10*6 cells.
- In a resource-poor country like India, prestorage leucoreduction of blood components using the new generation filters is a viable option.