

QUALITY ASSESSMENT OF PLATELET CONCENTRATES PREPARED BY PLATELET RICH PLASMA AND BUFFY COAT METHOD

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INTRODUCTION

Platelets or thrombocytes are the cells circulating in the blood that are involved in cellular mechanisms of primary hemostasis leading to the formation of blood clots. Dysfunction of platelets (thrombasthenia) or low levels of platelets (thrombocytopenia) predisposes to bleeding. The quality control is the most important parameter to assess the benefit of each blood component specially the Platelet concentrate (PC). Therefore it is required to study the ex-vivo quality of PCs prepared by different methods to establish the maximum therapeutic benefits to the patients.

AIM/OBJECTIVE

To evaluate quality control of platelets prepared by Platelet Rich Plasma (PRP) method and buffy coat (BC) method.

MATERIALS AND METHOD

A total of 60 platelet concentrates (30 units of PRP-PC , 30 units of BC-PC) were selected randomly and tested for the following parameters 1. Platelet count per ml. 2. Platelet count per bag. 3. pH changes.

RESULTS

Out of 60 platelet concentrates that were enrolled in this study. The 95% of confidence interval (CI) of platelet count per ml of PRP-PC and BC-PC was $915 \pm 2.87 \times 10^3$ and $1060.33 \pm 55.62 \times 10^3$ respectively. The 95% of CI of platelet count per bag of PRP-PC and BC-PC was $5.6 \pm 0.10 \times 10^{10}$ and $6.74 \pm 0.15 \times 10^{10}$ respectively. The 95% of CI of pH of PRP-PC and BC-PC was 6.8 ± 0.1 and 6.5 ± 0.1 respectively.

Parameters	PRP-PC (mean $\pm$ SD)	BC-PC (mean $\pm$ SD)
Platelet yield	$5.5 \times 10^{10} \pm 0.2$	$8.2 \times 10^{10} \pm 0.7$
pH	6.9 ± 0.1	6.5 ± 0.1

Table 2: Platelet count per unit of platelet concentrates and pH

Parameters	PRP-PC (95% of CI)*	BC-PC (95% of CI)*
Platelet per ml	$915 \pm 2.87 \times 10^3$	$1060.33 \pm 55.62 \times 10^3$
Platelet per Unit	$5.6 \pm 0.10 \times 10^{10}$	$6.74 \pm 0.15 \times 10^{10}$
pH	6.8 ± 0.10	6.5 ± 0.10

CI* Confidence interval

DISCUSSION

Platelet yield is the most important quality control parameter which will compare the efficacy of PC. Higher platelet count responds to higher yield and the higher the platelet yield, better is the method of preparation. Platelet yields reflected in transfused platelet dose, influences platelet recovery in the patients and allows prolonging interval between transfusions. In present study amongst the RDP, BC-PC showed significantly higher platelet count than PRP-PC. Extremes of pH have detrimental effect on the viability of platelets is a known fact Recommended quality control guidelines are pH of greater than 6.0 at the end of its maximal storage period. Amongst the RDP, PRP-PC had higher pH than BC-PC.

CONCLUSION

In our study it was seen that even though PRP-PC and BC-PC fulfilled the desired quality parameters, platelet prepared by buffy coat method were at better yield in terms of platelet count.

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