



PRE AND POST DONATION HAEMATOLOGICAL PARAMETERS IN PLATELETPHERESIS DONORS: A TERTIARY CARE HOSPITAL OF NORTH INDIA

Pathology

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ABSTRACT

Background Platelets transfusion is an established clinical procedure in thrombocytopenia. The productivity and quality of collection of apheresis platelets have now improved with the new technical advances in automatic cell separators. It is also important to assess the effect of plateletpheresis on donors.

Material and Methods In this study pre and post donation haematological parameters namely Complete Blood Count (CBC) and Mean Platelets Volume (MPV) of 100 healthy plateletpheresis donors were recorded and the effects of plateletpheresis procedure on the donor during and after donation were studied.

Results Pre and Post donation haematological parameter like Haemoglobin (Hb), Hematocrit(Hct), Platelet count(PC) and White Blood Cell (WBC) count showed statistically significant differences.

Conclusion Training modules for the technical personnel, supervision of transfusion medicine specialists, close monitor and follow up of these donors is required.

KEYWORDS

Thrombocytopenia, donors monitoring, platelet count, plateletpheresis, Haematological parameters

Introduction

Apheresis is a Greek word meaning to 'separate' or 'remove'. In apheresis, blood is withdrawn from a donor or a patient in anticoagulant solution and separated into components. One or more components are retained and the remaining constituents are returned to the individual.^[1] Technical advances in automated cell separators have improved the productivity and quality of collection of single donor platelets.^[2] Persons who have taken NSAIDs within 72 hours may not be suitable donors for plateletpheresis.^[3,4] Donors undergoing plateletpheresis, transient and insignificant decrease in complete blood counts may occur.^[5-8]

Aim of study

To study the pre and post donation haematological parameters of 100 plateletpheresis donors.

Material and Method

It was a prospective, observational, non blinded study including the pre and post haematological parameters of plateletpheresis donors. A total of 100 healthy voluntary donors were enrolled in this study after taking informed and written consent. The selection of donors were done randomly after complete clinical and haematological investigations as per DGHS guidelines.^[4] 2ml of whole blood from the donor was collected into EDTA vials just before and within 30 minutes after the procedure.

Tests for ABO group, Rh type and Transfusion Transmitted Infections such as HIV 1 & 2, Hepatitis B, Hepatitis C, Malaria and Syphilis were performed before the procedure. Haematological parameters of the donors were analysed using calibrated automated analyser (Cell Counter mod. CELL-TECH Auto Haematology Analyser, I.S.E. S.r.l. made in EU). The statistical analysis was done using the SPSS system.

Observations

The mean age, weight and height of plateletpheresis donors were 30 years, 74 kg and 173 cm long respectively. All donors were male. Mean pre donation Haemoglobin, Platelet Count and WBC were between 13.6 gm in 34% donors, $250 \times 10^9/L$ in 42% donors and $8.1 \times 10^9/L$ in 37% donors while post donation, it was reduced to 13.2gm in

33% donors, $185 \times 10^9/L$ in 40% donors and $7.6 \times 10^9/L$ in 35% donors respectively.

Table 1 Comparison of Pre and Post donation haematological parameters of plateletpheresis donors.

Sr. No	Parameter	Pre-donation		Post-donation		Paired t-test	p value
		Mean	Range	Mean	Range		
1	Hb (gm/dl)	14.13±1.06	12-16.20	13.61±1.04	11.50-15.70	32.726	0.001
2	Hct (%)	43.91±3.04	37-50	42.99±3.12	35-49	8.397	0.001
3	PC (NX10 ⁹ /L)	267.32±56.39	165-450	202.90±45.69	108-312	16.321	0.001
4	MCV (fl)	90.52±1.26	83-91.60	90.69±0.53	90-91.60	1.041	0.303
5	MCH (pg)	32.25±8.58	28-91	31.37±1.31	29-34.70	0.713	0.479
6	MCHC (g/dl)	31.91±1.33	28-34	31.55±1.35	28-34	6.300	0.001
7	MPV (fl)	9.24±0.34	7.90-9.24	8.63±0.60	7.79-8.63	1.346	0.185
8	WBC (NX10 ⁹ /L)	7.40±1.42	5.80-7.40	6.20±1.39	4.30-6.20	34.090	0.001

Table 2 Change in haematological values after plateletpheresis.

Sr no.	Parameter	Fall
1	Hb (gm/dl)	0.52
2	Hct (%)	1.9
3	PC (NX10 ⁹ /L)	64.42
4	MCV (fl)	-0.17
5	MCH (pg)	0.88
6	MCHC (g/dl)	0.36
7	MPV (fl)	0.61
8	WBC (NX10 ⁹ /L)	1.2

The reduction in Hb, Hct, PC, MCHC and WBC after plateletpheresis donation was statistically significant as in table 1 and 2.

Discussion**Table 3 Mean comparison of Pre and Post donation haematological parameters of plateletpheresis donors with other studies.**

Sr. No.	Study	Pre donation Mean Hb (g/dl) (Range)	Post donation Mean Hb (g/dl) (Range)	Pre donation Hct (%)	Post donation Hct (%)	Pre donation Plt Count (NX10 ⁹ /L)	Post donation Plt count (NX10 ⁹ /L)	Pre donation WBC Count (NX10 ⁹ /L)	Post donation WBC Count (NX10 ⁹ /L)
1.	Fevzi et al ^[9] (2008)	15.6 ± 1.4	15.4 ± 1.3	44.5 ± 2.7	41.4 ± 3.1	198 (159-313)	144 (105-206)	6.95 (4.4-11.2)	6.6 (3.9-9.7)
2.	Anita Tendulkar et al ^[10] (2009)	13.7 ± 1 (12.5-17.3)	13.4 ± 1.1 (8.9-16.6)	41.9 ± 3.2 (34.0-54.2)	40.6 ± 3.3 (26.3-49.7)	255.2 ± 55.5 (150-438)	176.9 ± 48.6 (80-385)	6.6 ± 1.5 (3.3-12.1)	6.0 ± 1.4 (2.7-10.8)
3.	Suditpa Shekahar Dass et al ^[11] (2009)	13.9 ± 1.08 (12.2-17.2)	12.6 ± 4.74 (10.5-16.3)	40.8 ± 4.01 (31.8-54.1)	38.9 ± 3.41 (28.5-49.2)	213.7 ± 53.16 (150-467)	150.7 ± 46.77 (79-413)	7.5 ± 1.79 (3.8-15.1)	6.8 ± 3.06 (2.5-14.6)
4.	B Suresh et al ^[12] (2014)	14.8±1.097 (12.6-17.3)	14.5±1.4 (10.6-17.3)	43.29±6.62 (36.6-98.3)	41.64±4.96 (30.1-68.5)	280.34±54.55 (208-589)	175.58±44.56 (100-295)	8.28±1.88 (4.6-14)	6.95±1.76 (2.02-11.13)
5.	Present study (2017)	14.13±1.06 (12±16.20)	13.61±1.04 (11.50±15.70)	43.91±3.04 (37-50)	42.99±3.12 (35-49)	267.32±56.39 (165-450)	202.90±45.69 (108-312)	7.40±1.42 (5.80-7.40)	6.20±1.39 (4.30-6.20)

In present study, Pre donation and post plateletpheresis donation Haemoglobin, Haematocrit and WBC count was slightly decreased which is similar to other studies as Fevzi et al^[9], Anita tendulkar et al^[10], Suditpa shekahar dass^[11] and B Suresh et al.^[12]

Pre and post donation platelet count was similar to studies done by Fevzi et al^[9] and Suditpa shekahar dass^[11]. While studies done by Anita tendulkar et al^[10] and Suresh et al^[12] had reported higher mean reduction in platelet count from present study which could be due to higher platelet yield. A significant and sustained decrease in platelet count has been documented in present study but none of donors had significant clinical thrombocytopenia as in table 3.

Conclusion

In present study, donor safety was ensured throughout the procedure. Though there is insignificant decrease in post haematological parameters, none of the donor had significant clinical manifestation. To prevent the unfavourable events and for benefit of donors, training modules for the technical personnel, supervision of transfusion medicine specialists, close monitoring and follow up of these donors is required.

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