



Positives!! Ain 't No Good!! A Quasi-experimental Study To Determine The Efficacy of Crossmatched Platelets In Hemato-oncology Patients with Suspected Alloimmune Platelet Refractoriness

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Introduction

- Platelet transfusion therapy is an important aspect of supportive transfusion therapy for haemato-oncology patients.
- Lack of adequate response is the significant challenge that complicates the platelet transfusion support in such patients.
- Less than expected posttransfusion increment occurs for 20-70% of the multiply transfused thrombocytopenic patients owing to immune or non-immune causes.



Aim / Objectives

- To determine the prevalence of platelet refractoriness in hemato-oncology patients on platelet transfusion therapy.
- To evaluate the effectiveness of transfusion of crossmatched platelets in refractory patients.

Study Population

- Patients from Haemato-oncology
- Receiving single donor apheresis platelet transfusions
- Multitransfused (> two episodes)

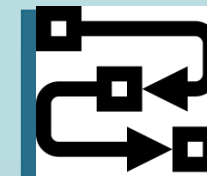
Study Design

Quasi-experimental study

Department of Transfusion Medicine & Hemato-Oncology

Calculated Sample size = 77

Study period: 2 years

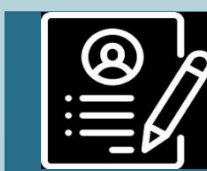


Methodology

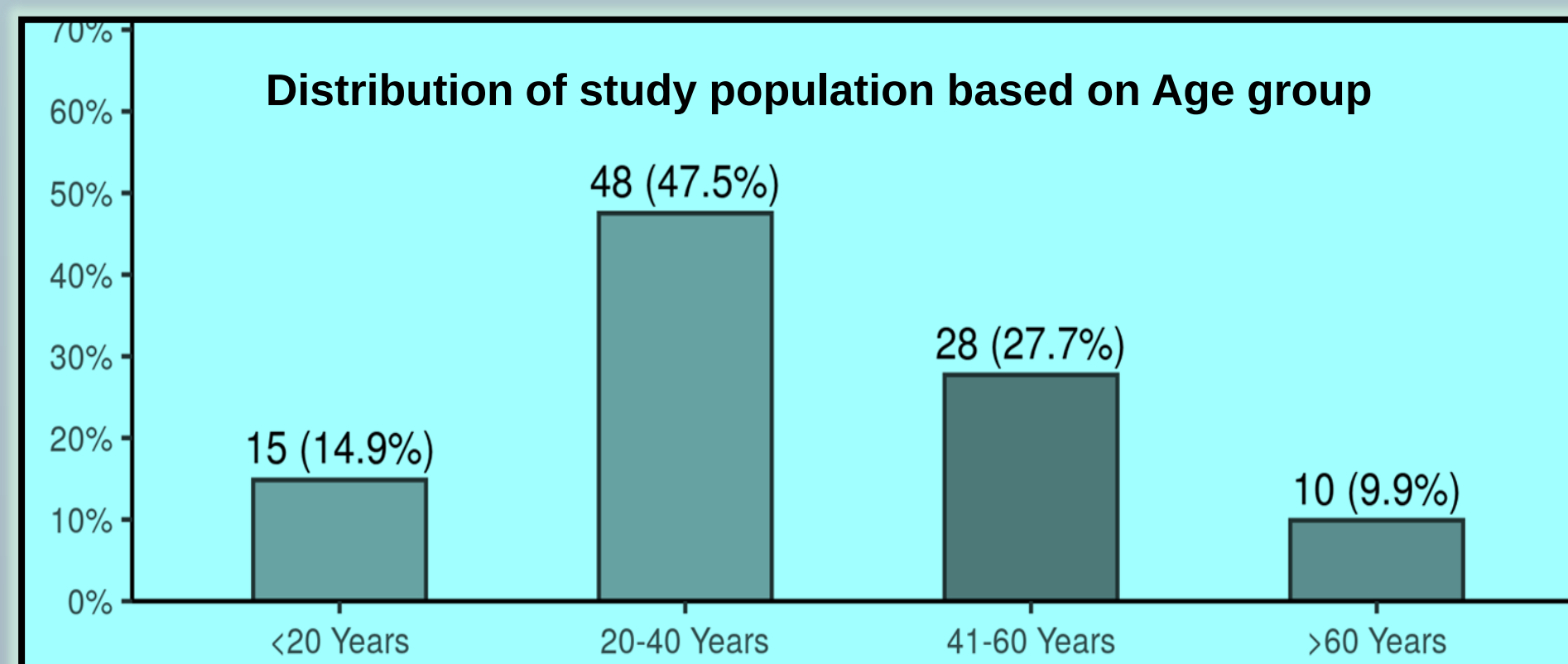
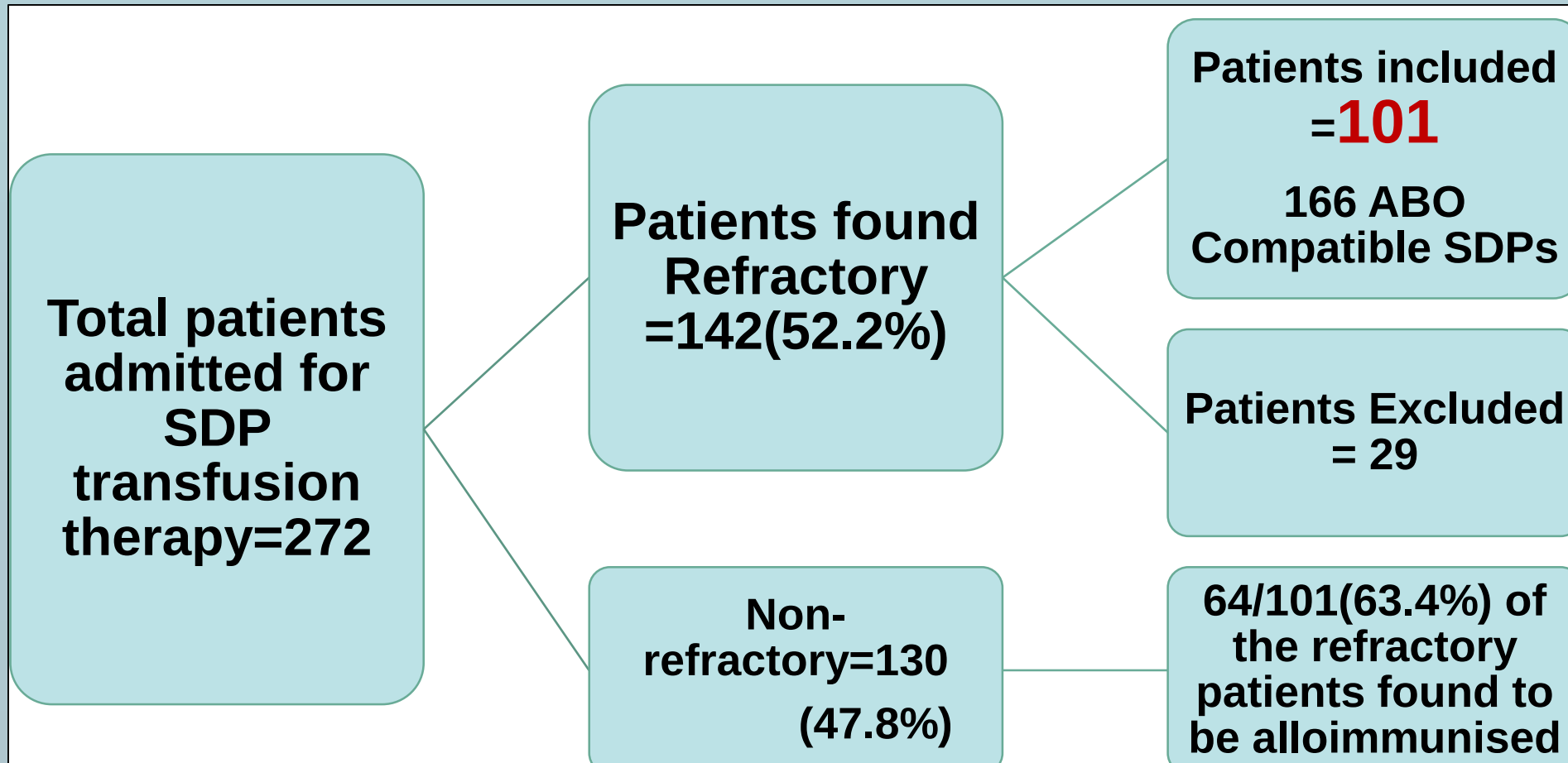
Samples subjected to Platelet Antibody detection / Platelet Crossmatch(PX) test using Capture-P Solid Phase Red Cell Adherence Assay

Patients- EDTA sample obtained from patient and stored at 2-8 degrees in case immediate testing is delayed

Source platelets - Samples from plateletpheresis units stored at 20-25 deg C and utilized anytime during their shelf life or segments from units were utilised to test



Results



- A weak positive correlation between Age (Years) and CCI Correlation was statistically significant (**rho = 0.2, p = 0.043**)

Table. 1 Association Between Platelet Crossmatch and Objective outcomes- CCI and PPR

CCI	PX		Wilcoxon-Mann-Whitney U Test	
	Compatible	Incompatible	W	p value
Mean(SD)	17788.02 (10828.74)	11913.54 (8844.73)	1637.500	0.001
PPR	PX		Wilcoxon-Mann-Whitney U Test	
	Compatible	Incompatible	W	p value
Mean(SD)	44.81 (28.02)	28.70 (21.83)	1648.000	<0.001

Statistically significant difference:

- Between the 2 PX groups in terms of CCI (**p = 0.001**)
- Between adequate and inadequate CCI response for crossmatch compatible and incompatible SDP transfusions (**p< 0.05**) [**$\chi^2 = 9.743$; p=0.0018**]

- A significant difference between the 11 diagnoses groups in terms of Platelet Increment (**$\chi^2 = 19.172$, p = 0.038**)

Table. 2 Regression Analysis for CCI

Dependent: CCI	Unit	Value	Coefficient (univariable)	Coefficient (multivariable)
Age (Years)	[4.0, 73.0]	Mean (sd) 14065.6 (9979.5)	127.67 (6.66 to 248.68, p=0.039)	122.28 (2.79 to 241.77, p=0.045)
Gender	Male	Mean (sd) 13490.8 (8005.2)	-	-
	Female	Mean (sd) 14675.5 (11775.1)	1184.68 (-2770.50 to 5139.85, p=0.554)	1217.33 (-2571.61 to 5006.27, p=0.525)
BMI (Kg/m ²)	15.2, 35.9	Mean (sd) 14065.6 (9979.5)	272.78 (-373.47 to 919.04, p=0.404)	101.51 (-523.29 to 726.30, p=0.748)
Platelet Crossmatch	Compatible	Mean (sd) 17788.0 (10828.7)	-	-
	Incompatible	Mean (sd) 11913.5 (8844.7)	-5874.48 (-9814.04 to -1934.91, p=0.004)	-5976.76 (-9893.54 to -2059.97, p=0.003)

MODEL FIT: F (4,96) = 3.57, p = 0.009
Number in dataframe = 101, Number in model = 101, Missing = 0, Log-likelihood = -1065.84
AIC = 2143.7, R-squared = 0.13, Adjusted R-squared = 0.093

Discussion

Authors	Year	Patients	No.	Testing Method	Alloimmunisation	Refractoriness
Salama et al	2014	Hemato-Onco	40	SPRCA	40%	61%(of Alloimm.)
Chavan et al	2014	Hemato-Onco	38	SPRCA	87.5%	55.8%
Desai et al	2017	Hemato-Onco	50	SPRCA	Compatible platelets ↔ higher CCI	
Present Study	2022 to 2023	Hemato-Onco	101	SPRCA	63.4%	52.2%



Conclusions

- About 52.2% of the transfused patients were observed to be refractory to platelet therapy and 63.4% of them were found to be alloimmunized.
- Incompatible platelet transfusions accounted for 84.8% of the inadequate responses to platelet therapy.
- Transfusion of crossmatched platelets to refractory patients ensured better post-transfusion platelet increment and platelet recovery.

Future Directions

- Routine utilization of platelet crossmatch testing for the hemato-oncological patients with thrombocytopenia on supportive platelet therapy.

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