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Assessment of Platelet Increment and Refractoriness to Platelet Transfusion in Pediatric Cancer Patients, Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia - A prospective cross-sectional Study

ACKNOWLEDGMENT

Above all I would like to thank God, who has helped me through the whole time. I would also like to acknowledge my dear advisors Pr. Damte Shimelis and Dr. Daniel Hailu for consistent support and constructive critiques throughout the whole thesis work. Finally, I would like to give due appreciation to my family for their unconditional support in all regards.

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ABBREVIATIONS AND ACRONYMS

PCHR	Pediatrics and Child Health Resident
PTR	Platelet Transfusion Refractoriness
TRAP	Trial to Reduce Alloimmunization to Platelets
ASCO	American Society of Clinical Oncology
AML	Acute Myelogenous Leukemia
CCI	Corrected Count Increment
TASH	Tikur Ambessa Specialized Hospital
ALL	Acute lymphoblastic leukemia
NHL	Non-Hodkins Lymphoma
RMS	Rhabdomyosarcoma
PLT	Platelet
PI	Platelet increment
ER	Emergency Room
PCI	Platelet count increment
NBL	Neuroblastoma

Abstract

Background: Platelet transfusion is an essential supportive component of the treatment of oncology patients with survival benefit. Platelet transfusion refractoriness is an important challenge in pediatric cancer patients who require repeated transfusions.

Objectives To assess platelet increment and refractoriness after platelet transfusion in pediatric cancer patients, Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia

Methods: In this study, 113 eligible patients were included and data was collected by oriented nurses and physicians using structured questionnaire. Data completeness assessment and coding was done and it was processed and analyzed by SPSS version 25 using frequency tables, Chi Square and Regression analysis tools.

Result: In this study, 113 pediatric cancer patients were included. Most of the patients are in the age group of 5-10 years (46.9%) followed by under 5 years (43.4%). The majority are male sex accounting for 57.5 %. There is a significant association between platelet increment after transfusion with the type of cancer(p=0.001) and being on chemotherapy (p 0.018) on Chi square analysis. Regression analysis revealed negative correlation between age of patient and platelet increment(p=0.14). There is also significant association between splenomegaly and previous platelet transfusion with platelet increment (p=0.003 for both). The incidence of platelet transfusion refractoriness is 12.5%.

Conclusion: Based on the findings of this study, increment of platelet in pediatric cancer patients in TASH is affected by age of patient, Type of cancer, Splenomegaly, Previous platelet transfusion history and Chemotherapy. Platelet transfusion refractoriness is seen in 12.5% of the patients.

Recommendation

We recommend a larger-scale study with better organized methodology to be conducted to draw more representative results.

1. INTRODUCTION

1.1 Background

Platelet transfusions are an essential aspect of supportive care for pediatric oncology patients(1). Although transfusion of blood products is an essential and potentially life-saving measure, not all blood transfusions are beneficial to patient(2). The associated risks, particularly transfusion-transmitted infections require careful consideration before a decision is made to transfuse any blood product(3). Platelet refractoriness is another complication of platelet transfusion that affects variable proportions of patients (4).

History of platelet transfusion, splenomegaly, sepsis, DIC and severe bleeding are the risk factors of platelet refractoriness in pediatric patient(5).

Cancer patients often receive high-dose chemotherapy and are therefore at risk of developing severe thrombocytopenia requiring long term transfusion and many develop platelet transfusion refractoriness(6) One unit of platelets should increase the platelet count by 35,000 to 40,000/µL as measured within 1 hour following the transfusion(7). In patients with cancer, the incidence of PTR differs from 4.8% to 54.7%, according to its distinct definitions and study populations(8). A large recent study showed that platelet refractoriness develops in 13% of patients with acute leukemia transfused with traditional blood products and in 3 to 4% of recipients of white cell-reduced blood components(9).

It is recommended that at least on two sequential occasions, a 10-min to 1-h post-transfusion Corrected count increment (CCI) of less than 5×109/l, percent of platelet recovery (PPR) of <30% or platelet increment (PI) <11×109/l using ABO-identical fresh platelets less than 72h old, should be used in making the diagnosis of refractoriness(10).

About 80% of refractory cases are classified as non-immune PTR in which platelet survival is shortened by various underlying conditions such as fever/sepsis, splenomegaly, DIC, graft-versus-host disease, vaso-occlusive diseases, drug-induced thrombocytopenia, hematopoietic stem cell transplantation, and hemorrhage and the remaining cases are classified as immune PTR(11). Platelet transfusion outcome is impaired in only 50% of the patients having alloimmune factors. HLA

alloimmunisation has been convincingly reduced by the use of leucocyte–depleted transfusions. UV–B irradiation of platelet may be alternatively used to reduce HLA alloimmunization(12). ABO antibodies may play a role in refractoriness, which can be abolished by transfusion of ABO–identical platele(13). In case of non–alloimmune factors associated with increased platelet consumption, increasing the transfusion frequency can be considered. Additional investigations are still necessary to define risk factors for secondary HLA alloimmunisation and refractoriness due to non–immune factors to further decrease the incidence of refractoriness(12).

1.2 Statement of the problem

Almost 9 out of 10 children with ALL live in low- and middle-income countries (LMIC) where overall survival rates 5 years from diagnosis are significantly lower (16–65%) with population-based data, including Jordan, Mongolia, Lesotho and India(14). Among factors contribute to this gap is inadequate supportive care like PLT and other blood product availability, facilities, personnel and healthcare funding(15).

The transfusion of blood components like platelet, is a critical part of the care of children with hematologic and oncologic diagnoses(5). However, when PTR occurs, it represents a significant clinical problem and may lead to fatal bleeding complications in thrombocytopenic patients (1, 16).

The recommendation by International Collaboration for Transfusion Medicine places a relatively high value on the prevention of hemolytic transfusion reactions (which have been known to occur with ABO-mismatched transfusions) and the development of refractoriness when ABO-identical platelet transfusions were used (14).

Based on the TRAP trial, the current ASCO recommendation is that all AML patients, and possibly other patient groups who require multiple platelet transfusions, receive leuko-reduced platelet transfusions in an effort to prevent platelet alloimmunization(5). UV–B irradiation of platelet may be alternatively used to reduce HLA alloimmunization(14).

1.3 Significance of the Study

Patients with increased risk factors to have poor platelet increment and those with suspected PTR can be prioritized to get platelet transfusions without ABO-mismatch and stored for shorter period of time. Other methods of prevention and treatment of PTR can be assessed for feasibility and applicability in our setup. The finding of this study can be used as an insight for more wider and better structured studies.

2. LITERATURE REVIEW

In children, there is low-level evidence regarding the prophylactic platelet transfusion in many situations of thrombocytopenia(17). Most pediatric guidelines are extrapolated from adult studies with the most evidence in treatment-associated hypo-proliferative thrombocytopenia varying between a platelet transfusion threshold of 10,000/µL to 20,000/µL(2). Platelet transfusion is an essential supportive component of the treatment of oncology patients with survival benefit(18). A study done in India(S. Subash, 2018) showed clinical management of children with acute leukemia has significantly improved with use of platelet transfusions and thereby, the mortality rate due to bleeding complications has dropped rapidly with remarkable clinical improvement in clinical outcomes(19).

When deciding whether or not to administer a platelet transfusion, one must decide on the appropriate platelet threshold that will maximize the benefit-to-risk ratio for the patient (1).

Platelets are often transfused without respecting the ABO compatibility due to the limited stock availability. Platelet ABO antigens that are incompatible with recipient ABO antibodies may have accelerated clearance from circulation and result in lower count increments(20). On a systematic review (Nadine Shehata, 2009) PLT count increment was the primary outcome of several studies and was consistently higher with ABO-identical PLT transfusion. The largest difference in increment between ABO-identical and nonidentical PLT transfusion was 4 x109/L(20).

A challenging complication raised from multiple platelet transfusions is the platelet transfusion refractoriness, which is defined by trial to reduce alloimmunization to platelets (TRAP) study group as a CCI of <5 x109/L measured 1 hour after transfusion of ABO matched, fresh (<72 hours) platelets on two separate occasions(5, 21, 22).There are relatively few reports describing the incidence and features of platelet refractoriness and alloimmunization in children(23). A large recent study showed that platelet refractoriness develops in 13% of patients with acute leukemia transfused with

traditional blood products and in 3 to 4% of recipients of white cell-reduced blood components(9).

The posttransfusion platelet count is dependent on the pretransfusion platelet count, the dose of platelets transfused, and other factors that affect the recovery, both technical and clinical(19). In individuals without splenomegaly, one third of radiolabeled autologous platelets are reversibly pooled in the spleen at any given time, whereas two thirds remain in the circulation so adjustments to the recovery need to be made. Recovery of autologous platelets is on the order of 66 +_ 8% and approaches 100% in asplenic individuals. Recovery is modestly reduced in thrombocytopenic patients with counts below 50,000/gL to approximately 50% _+ 22%(24)

Patients diagnosed of hematological malignancies undergoing chemotherapy or hematopoietic stem cell transplantation have often long period of thrombocytopenia and high platelet transfusion requirements. Evidence from various randomized clinical trials and meta-analyses support the prophylactic strategy for such patients(25).

Prophylactic platelet transfusion for platelet counts less than or equal to 10 × 109/L is the optimal approach to decrease the risk of hemorrhage for patients requiring chemotherapy or undergoing allogeneic or autologous transplantation(14).

Generally, patients with the diagnosis of AML require more frequent transfusions with platelet and they are also more prone to develop refractoriness fore platelet transfusion(26).

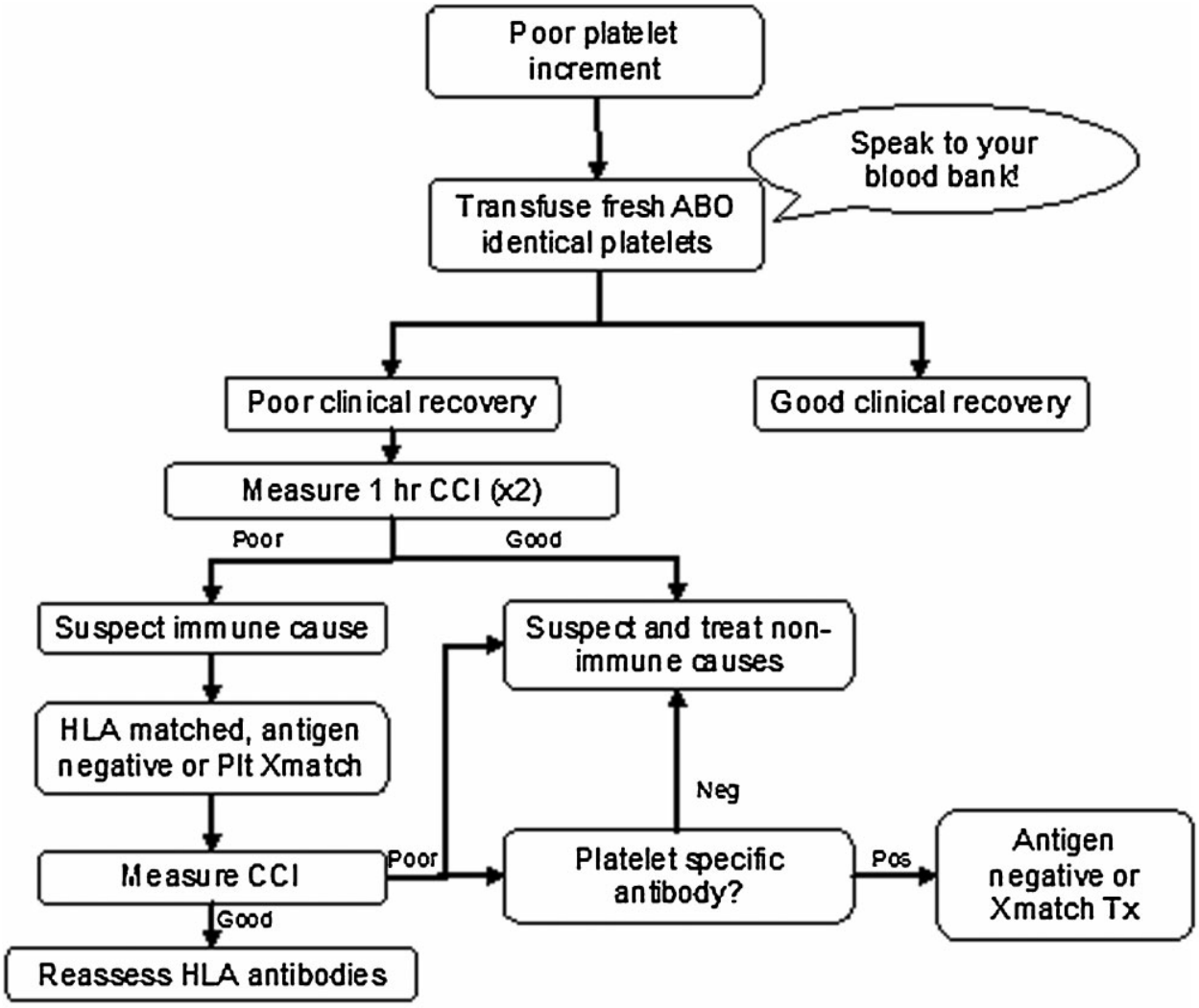


Fig1. An approach to the investigation and management of platelet refractoriness

3. OBJECTIVES

3.1 General objective

To assess platelet increment and refractoriness after platelet transfusion in Pediatric Cancer patients, Tikur Anbesa Specialized Hospital, Addis Ababa, Ethiopia

3.2 Specific objectives

1. To determine platelet increment after platelet transfusion
2. To calculate magnitude of platelet transfusion refractoriness
3. To identify determinant factors for platelet increment

4. METHOD

4.1 Study area

This study was conducted at the Pediatric Hematology-Oncology Unit of Tikur Anbessa Specialized Hospital(TASH), Addis Ababa, Ethiopia. It is a referral and teaching hospital located in Arada subcity of Addis Ababa, Ethiopia. The hospital is a teaching hospital of Addis Ababa University and a major referral center from all corners of the country especially for cancer patients. The hospital has a variety of specialty and sub-specialty training in various fields of study including Pediatrics and child health, gynecology/obstetrics, surgery and oncology. The hospital owned the only oncology center in the nation providing radiation therapy. There are about 42 beds (added oncology center 16 and TASH 26) devoted to pediatric cancer care. The oncology clinic has a minimum of 50patientsper day. The Hospital aspires to become a center of excellence in the diagnosis, treatment and care of patients with cancer.

4.2 Study Design and study period

A prospective Cross-sectional study has been conducted at Tikur Ambesa Specialized Hospital, Department of Pediatrics and Child health Oncology-Hematology Unit from June1/2021-September30/2021

4.3 Source population

Pediatric cancer patients on follow up at TASH, Pediatric Hematology-Oncoogy units and those who visit ER during the study period.

4.4 Study population

Pediatric cancer patients who come to TASH and require platelet transfusion.

4.5 Eligibility Criteria

4.5.1 Inclusion criteria

1. Pediatric cancer patients between age group 1year to 18years who were transfused with platelet.

2. Those who have pre-transfusion platelet (CBC) determined and for whom post transfusion CBC determination in between 10min and 1hour is possible.

4.5.2 Exclusion Criteria

1. Those who were transfused with other blood products between pre and post platelet transfusion CBC sample collection.

2. Those who cannot have post transfusion CBC within the specified time period because of any reason.

4.6 Sample size determination

Sample size determined using single population proportion formula using p 0.08 taken from an institution-based study fixed the sample size to 113.

$$n = \frac{Z_{\alpha/2}^2}{d^2} p(1 - p)$$

n=113

Where;

n = sample size required

Z = 1.96 at95% confidence interval

P = 0.08(from previous studies)

d = 5% margin of error

4.7 Sampling procedure

Every consecutive eligble patient at respective wards during the study period were included in the study.Therefore, we used consecuitive sampling technique.

4.8 Variables

4.8.1 Dependent Variable

Platelet increment/Refractoriness

4.8.2 Independent Variables

Age, Sex, Type of underlying malignancy, splenomegaly Treatment status, Previous transfusions, ABO match/mismatch, Platelet shelf life.

4.9 Data collection technique, instruments and quality assurance

Data was extracted from the patient's card and electronic medical record using their Icare number and collected using structured questionnaire by oriented nurses and residents The principal investigator has been checking data for completeness and validity. Repeated pretransfusion and post transfusion platelet count after next transfusion was documented for patients with platelet increment <10x109/l in the initial transfusion.

4.10 Data management and analysis

After the data was collected and checked for completeness it was coded and entered to SPSS version 25 for analysis. Descriptive statistics was presented using frequency tables and figures.

Linear regression was used to assess the association between independent variables and count increment of platelet after transfusion among pediatrics with cancer. Simple linear regression was applied to screen out potentially significant independent variables and those variables with 25% level of significance were included in multivariable linear regression model. Regression coefficient β, p value and confidence interval for β was used for testing significance and interpretation of results. Variables with p value ≤ 0,05 were considered as statistically associated with the outcome variable.

4.11 Operational definition

Either post-transfusion platelet increment (PPI) < 10 x 109/L or corrected count increment (CCI) at 10–60 mins <5–10 x 109/L on two occasions after transfusion of ABO compatible platelets stored for less than 72 h, are used to diagnose PTR(25). Calculated as PI=P2-P1

Where;

PI: Platelet increment

P1: Pre-transfusion platelet

P2: Post-transfusion platelet

4.12 Ethical consideration

To carry out this study, ethical approval was obtained from Research Ethics Committee after proposal evaluation by Departmental Research Proposal Checklist (DRPC). Formal letter written to TASH Pediatric Hematology-Oncology unit.

Consent was obtained from care takers. Data kept confidential and anonymous and it was used only for research purpose

5. Result

In this study, 113 pediatric cancer patients who fulfilled the inclusion criteria were enrolled. Most of the patients are in the age group of 5-10 years (46.9%) followed by under 5 years (43.4%). The majority are male sex accounting for 57.5 %. ALL constitutes 78.8% of the diagnosis followed by AML 8% and NHL 5.3%. Palpable splenomegaly found in 41.6% of the total subjects. 31.9% were on chemotherapy and 76.1% had history of previous platelet transfusion. Blood group of the patients is O+ and A+ in 40.7% and 38.1% respectively as summarized on table 1. Mean pretransfusion platelet count is 16654(std +/- 11898.2).

Table1

Socio-demographic, medical and disease related variables and platelet increment after transfusion category among pediatric cancer patients (n= 113)

Variables		Platelet increment after transfusion			Total
		Less than10000 Count (%)	10000-30000 Count (%)	Greater than 30000 Count (%)	
Sex of patient	**Male**	8 (40.0%)	23 (59.0%)	34 (63.0%)	65 (57.5%)
	Female	12 (60.0%)	16 (41.0%)	20 (37.0%)	48 (42.5%)
Age group	**Less than 5**	8 (40.0%)	16 (41.0%)	25 (46.3%)	49 (43.4%)
	5 to 10	9 (45.0%)	18 (46.2%)	26 (48.1%)	53 (46.9%)
	11 to 18	3 (15.0%)	5 (12.8%)	3 (5.6%)	11 (9.7%)
Palpable Splenomegaly	**Yes**	8 (40.0%)	24 (61.5%)	15 (27.8%)	47 (41.6%)
	No	12 (60.0%)	15 (38.5%)	39 (72.2%)	66 (58.4%)
Treatment given	**chemotherapy**	12 (60.0%)	10 (25.6%)	14 (25.9%)	36 (31.9%)
	None	8 (40.0%)	29 (74.4%)	40 (74.1%)	77 (68.1%)
Previous transfusion history	**Yes**	18 (90.0%)	34 (87.2%)	34 (63.0%)	86 (76.1%)
	No	2 (10.0%)	5 (12.8%)	20 (37.0%)	27 (23.9%)
Diagnosis of patient	**ALL**	11 (55.0%)	32 (82.1%)	46 (85.2%)	89 (78.8%)
	AML	6 (30.0%)	3 (7.7%)	0 (0.0%)	9 (8.0%)
	Others	3 (15.0%)	4 (10.3%)	8 (14.8%)	15 (13.3%)
Blood group of the patient	**A+**	8 (40.0%)	15 (38.5%)	20 (37.0%)	43 (38.1%)
	B+	3 (15.0%)	4 (10.3%)	11 (20.4%)	18 (15.9%)
	O+	6 (30.0%)	20 (51.3%)	20 (37.0%)	46 (40.7%)
	AB+	3 (15.0%)	0 (0.0%)	3 (5.6%)	6 (5.3%)

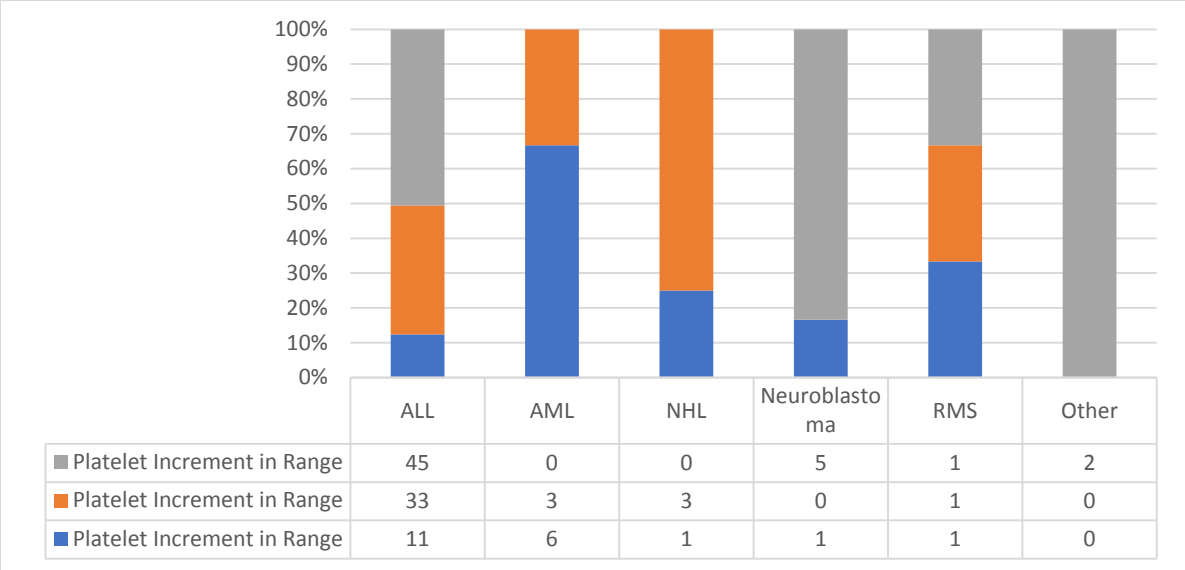
Chi-Square analysis result showed that there is a significant association between platelet increment after transfusion with the type of cancer(p=0.001) and being on chemotherapy (p 0.011).

Table2

Cross tabulation and Chi Square results of Independent Variables with Platelet count Increment in Range*

Factors		Platelet Increment in Range			Total	p- value
		<10000	10000-30000	>30000		
Diagnosis of patient	ALL	11	33	45	89	**0.001**
	AML	6	3	0	9	
	NHL	1	3	0	4	
	NBL	1	0	5	6	
	RMS	1	1	1	3	
	Other	0	0	2	2	
Treatment given	Chemotherapy	12	11	13	36	**0.011**
	None	8	29	40	77	

*Table constructed only for variables that have significant association with platelet count increment



	ALL	AML	NHL	Neuroblastoma	RMS	Other
Platelet Increment in Range	45	0	0	5	1	2
Platelet Increment in Range	33	3	3	0	1	0
Platelet Increment in Range	11	6	1	1	1	0

Fig. 2 Diagram showing platelet increment variability by type of Cancer

Variables with p value <0.25 on simple linear regression were selected and multiple-linear regression analysis was done which revealed significant association between age of patient, palpable splenomegaly and previous platelet transfusion had statistically significant association with post transfusion platelet increment. Other variables didn't show significant association with the dependent variable. Age and post transfusion platelet increment has a negative relationship which is as age increases by 1year the post transfusion platelet increment decreases by 1537 (95% CI,- 2744, -318).(Table 3)

Mean platelet increment in patients with no palpable splenomegaly is greater than in patients who have palpable splenomegaly by 12137 (95% CI, 4262, 20011). The mean post platelet transfusion count in patients with history of previous transfusion is less by 1414395%CI, 5051,23235) as compared to patients who has no history of previous transfusion (table 3).

Table 3

Multiple-linear regression analysis independent variables and count increment after platelet transfusion (n= 113)

Predictors	B (95.0% CI)	SE	Beta	t	p-value
Age of patient	-1531 (-2744, -318)	611.764	-.223	-2.503	**.014**
Sex of patient	-4929 (-12453, 2596)	3794.328	-.114	-1.299	.197
Diagnosis of patient	-2050 (-8430, 4330)	3217.303	-.067	-.637	.525
Palpable Splenomegaly	12137 (4262, 20011)	3970.878	.281	3.056	**.003**
Treatment given	1377 (-3310, 6064)	2363.416	.060	.583	.561
Previous transfusion history	14143 (5051, 23235)	4584.974	.283	3.085	**.003**
Blood group of the patient	247 (-3477, 3971)	1877.961	.011	.132	.896
Age of platelet after collected in days	1840 (-2157, 5838)	2015.886	.086	.913	.363

R^2 = .258

N= 113

P value <0.05 is significant

A total of 72 patients were transfused with blood group identical to their type and platelets stored for </=3days and the remaining 41(33 were transfused with platelet stored for > 3days and 8 transfused with platelet with different blood group). So, incidence of PTR calculation is done excluding these 41 patients.

Based on the operational definition, there were 9(12.5%) patients with PTR. All of the 9 patients had history of previous platelet transfusion. Four out of 9(44.4%) had palpable splenomegaly and 4/9(44.4%)

were on chemotherapy. Their diagnosis is 5 ALL, 3 AML and 1 Neuroblastoma. Here we can see percent of PTR by diagnosis (AML 3/9(30%), ALL 5/89(5.6%) and Neuroblastoma 1/6(16.6)).

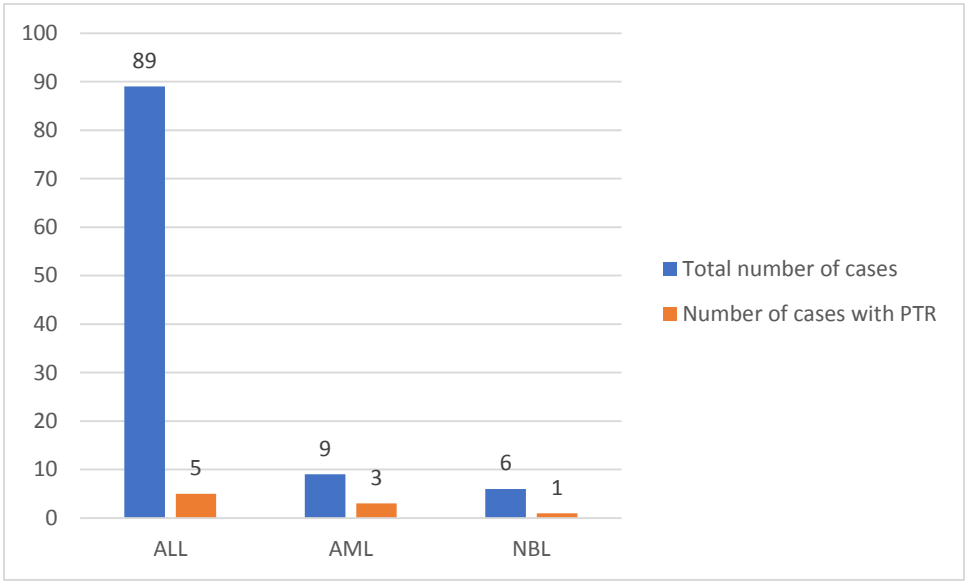


Fig.3 Rate of Platelet Transfusion Refractoriness per Cancer Type in Pediatric Cancer Patients, TASH

6. Discussion

This study included a total of 113 children with cancer who met eligibility criteria; among these, 46.9% are in the age group of 5-10years and 43.4% under 5years. The majority are male sex accounting for 57.5 %. ALL is 78% constituting the largest proportion of cancer in the study subjects which is consistent with other studies(15). Mean pretransfusion platelet count is 16654(std +/-11898.2) which is in the range of recommended prophylactic platelet transfusion threshold for cancer patients that is <10-20x109/l(17) suggesting most transfusions are delivered for a reasonable indication which is important to reduces risk of refractoriness to platelet transfusion. Chi-Square analysis result showed that there is a significant association between platelet increment after transfusion with the type of cancer and being on chemotherapy (p =0.001 and 0.011respectively). This agrees with a study done in Saudi Arabia with a title Platelet Transfusion Refractoriness among Patients with Hematological Malignancies in a Tertiary Center, Subgroup analysis showed a significant association between the patient's diagnosis and the development of PTR (75.0% CML, 18.9% NHL, 16.7% AML, 7.1% ALL, 0.0% HL p=0.011)(18). Age and post transfusion platelet increment has a negative relationship which is as age increases by 1year the post transfusion platelet increment decreases by 1537 (95% CI,- 2744, -318). Supportive finding was published on a study done in Canada with the title Platelet transfusion practice and platelet refractoriness for a cohort of pediatric oncology patients(1) and On an article published on Canadian blood service with the title of Transfusion in Children with Cancer, older children with cancer were prone to have lower increment in their platelet count and PTR after transfusions(27). Regression analysis also revealed significant association between palpable splenomegaly, previous platelet transfusion and post transfusion platelet increment at (p 0.003, 0.003) respectively. This finding is in line with a study done in Indonesia with a title of Risk factors of platelet refractoriness in Children(21).

PTR was found in 9/72(12.5%) of the patients in this study. All of the 9 patients had history of previous platelet transfusion and their diagnosis is ALL (5,5.6%), AML (3,30%) and 1 Neuroblastoma. Four out of 9(44.4%) had palpable splenomegaly and 4/9(44.4%) were on chemotherapy. In summary, each of the patients who developed PTR has at least one established risk factor. The incidence of PTR is greatly varied in different literatures and publications ranging from 4.8% to 54.7%(8). Institution based cohort study on pediatric cancer patients included 367 patients in Toronto, revealed 8% PTR. A large recent study showed that platelet refractoriness develops in 13% of patients with acute leukemia transfused with traditional blood products and in 3 to 4% of recipients of white cell-reduced blood components(9).An Indian study on Effectiveness of platelet transfusion in acute leukemic pediatric patients: a prospective study which enrolled 30 patients reported no refractoriness which could be due to small sample size and may not be reliable. In our case, about 80% of the patients were taken from pediatric emergency ward where patients mostly visit on their first presentation suggesting majority of the included patients may not have previous repeated transfusions and early to develop PTR. This may imply that even more magnitude could be expected in the oncology wards where patients stay longer, take chemotherapy and need repeated transfusions.

Limitations

This study was conducted over 3month period of time due to time constraint which is too short to catch sufficient number of cases. It also demanded more organized system to ensure quality of work in every step which needs dedicated and responsible personnel for timed sample and data collection which we did as additional work on staff with some inconvenience.

Conclusion

Based on the findings of this study, increment of platelet in pediatric cancer patients in TASH is affected by age of patient, Type of cancer, Splenomegaly, Previous platelet transfusion history and Chemotherapy. Platelet transfusion refractoriness is seen in 12.5% of pediatric cancer patients.

Recommendation

The findings of this study may not reliably and precisely assess the true degree of associations between the variables and incidence of platelet transfusion refractoriness. We recommend a larger study with better organized methodology to be conducted to draw more representative results.

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8. ANNEX

Annex 1

Assessment of Platelet Increment and Refractoriness after Platelet Transfusion in Pediatric Cancer Patients, Black Lion Hospital, Addis Ababa, Ethiopia

Questionnaire

Inclusion criteria

1. Pediatric cancer patients between age group 1year to 18years who were transfused with platelet.

2. Those who have pre-transfusion platelet (CBC) determined and for whom post transfusion CBC determination in between 10min and 1hour is possible.

Exclusion Criteria

1. Those who were transfused with other blood products between pre and post platelet transfusion CBC sample collection.

2. Those thatwere transfused with platelet but are not cancer patients

I. Demography

ID No……. Age …….

Encircle the number which holds the answer for the next questions when applicable:

Sex

1. Male
2. Female

Phone no…….

II. Clinical background

Main working diagnosis:

1. ALL
2. AML
3. NHL
4. Wilms Tumor
5. NBL
6. RMS
7. Other, specify……

Palpable splenomegaly:

1. Yes
2. No

Treatment given

1. Chemotherapy
2. Radiotherapy
3. None
4. Other specify……..

III. Transfusion related profile

Previous platelet transfusion

1. Yes
2. No

Blood group of the patient

1. A
2. B
3. AB
4. O

Rh

1. Positive
2. Negative

Blood group of currently transfused platelet (you can choose more than one if different blood group transfused on current transfusion)

1. A
2. B
3. AB
4. O

Rh

1. Positive
2. Negative

IV. Platelet specific information

Pre-transfusion platelet count……Post transfusion platelet count determined 1hour after transfusion……time gap in hrs if different from 1hour……

Number of units transfused…….

Number units required……

Date of collection of platelet ……Date of transfusion…….

Time gap in days (age of platelet) ……

*Repeat part IV for patients who have change in platelet of <10X109/l after initial transfusion

Annex 2

Consent Form

Assessment of Platelet Increment and Refractoriness after Platelet Transfusion in Pediatric Cancer Patients, Black Lion Hospital, Addis Ababa, Ethiopia

ID----------

I----------, the care giver of the child with the mentioned identification number was informed that research on platelet transfusion and increment after transfusion is being done for children who require platelet transfusion and post transfusion CBC determination is required to be done within 1hr of transfusion. I am also informed that it will not pose any risk to the child. Therefore, I agree and, I put here my signature ----------

የ ስ ምምነ ት ቅጽ

መሰ ያ ----------

ስ ኔ ----------

ከ ሳ ደ በ መሰ ያ ው የ ተ ጠ ቀ ሰ ው(ች ው)

ል ጅ ስ ሳ ካ ሚ ስ ሆ ን ኘ ሳ ት ሌ ት ስ ስ መ ው ሰ ድ ና ኘ ሳ ት ሌ ት የ ሚ ያ ስ ፈ ል ጋ ቸ ው ና የ ወ ሰ ዱ ዘ ዓ ና ት ከ ወ ሰ ዱ በ ጉ ሳ ኘ ሳ ት ሌ ታ ች ው ምን ያ ህ ል ስ ን ደ ሚ ጨ ምር ስ ማ ቀ ጥ ና ት ስ የ ተ ደ ረ ገ መሆ ኑ ተ ነ ግ ር ኛ ል ። ። ኘ ሳ ት ሌ ት በ ወ ሰ ዱ በ ጉ ሳ በ ስ ን ድ ሰ ዓ ት ው ስ ጥ ሰ ሲ ቢ ሲ ደ ምስ ን ዲ ወ ሰ ድ ሳ ች ው የ ሚ ያ ስ ፈ ል ግ መሆ ኑ ን ና ደ ህ ምምር መረ ጡ በ ል ጁ ሳ ደ ምን ምተ ጽ ዕ ኖ ስ ን ደ ማ ደ ኖ ረ ው ተ ረ ድ ቼ መስ ማማቴ ን በ ፈ ር ማ ዬ ስ ረ ጋ ግ ጣ ስ ሁ ። ።