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**INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.2577264>Available online at: <http://www.iajps.com>**Research Article****COMPARISON OF TWO METHODS OF TRANSFUSION
THERAPY FOR STROKE PREVENTION IN SICKLE CELL****¹Dr. Abdul Manan, ²Dr. Waleed Asghar, ³Dr. Muhammad Arslan Mumtaz****¹MBBS; King Edward Medical University, Lahore, Pakistan, ²MBBS; King Edward Medical University, Lahore, Pakistan, ³MBBS; King Edward Medical University, Lahore, Pakistan.****Abstract:**

Chronic blood transfusions are very important in the care of sickle-cell patients in danger for morbidity and death caused by stroke. In the thorough sickle cell center, researcher assist chronic transfusion using rapid manual partial exchange transfusions (RMPET) working with a particular access fundamental line port. Researchers have no detailed adult sickle cell program mostly in the hospitals, however upon transition of patients to the adult transfusion clinic they might be supplied simple transfusion (ST) rather than exchange. Since researchers employ a smaller sickle cell population without having erythrocytapheresis functionality, researchers examined whether switching their patients to simple transfusion is going to be viable lacking limiting their haemoglobin S measurement variables or ferritin levels.

To review the patients on chronic transfusion support and evaluate the variety of strategies to better recognize the effects from switching from RMPET to ST.

We utilized a potential observational cohort design to work out that technique for transfusion was ideal for reducing haemoglobin S measurement. A crossing over design was adopted so that every patient served as its personal control. Nine subjects around the age groups of 4 years to 23 years were part of the research of 10 chronically transfused patients. Accordingly, 8 of 9 subjects experienced Sickle cell SS hemoglobinopathy and 1 had S Beta^o Thalassemia. Researchers likewise interviewed patient inclination for every transfusion mode and care-giving opportunity to perform the transfusion.

A Wilcoxon signed-rank test decided that there had not been a statistically important median difference in Hb S by the end of the transfusion, each method achieving Hb S < 30%. There had been also no statistically important median difference in Ferritin levels. The center has preferred to replace the transfusion exercise to straight transfusion and not RMPET that will be additional time ingesting. Patients were additionally delighted by the straight transfusion technique. Nursing staff was appreciative with the shorter transfusion times. The outcomes may possibly support some other smaller programs decide to use straight transfusion instead than rapid manual partial exchange to use on their chronically transfused patients.

Keywords: *Chronic transfusion therapy; Sickle cell disease; Stroke prevention.*

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INTRODUCTION:

Stroke takes place in 10% of Sickle Cell Disease (SCD) patients ahead of the age of twenty Years. Existing standard of look after the secondary stroke prevention in individuals with SCD is chronic red blood cell (RBC) transfusions. Stroke recurs in ~60% of patients lacking chronic RBC treatment as well as in ~20% of patients with chronic transfusion while keeping a haemoglobin S portion of lower than 30%.

Indefinite transfusion treatment therapy is applied considering discontinuation following short-term or long-term contraceptive transfusions triggers persistent overt strokes and better CNS destruction, despite the presence of transition to hydroxyurea. Chronic transfusion additionally avoids primary strokes in high-risk patients displaying Trans-cranial Doppler ultrasound (TCD). The Stroke Prevention Study in Sickle Cell Disease (STOP) exhibited a 92% stroke risk lowering among 63 of 130 youngsters with irregular TCD outcomes. Rates of stroke decreased considerably since applying ritual TCD assessment and first prophylactic transfusion therapy.

The following STOP 2 trial assists the application of chronic transfusion consistently due to the fact that discontinuance ended in an enhanced rate of abnormal TCD transformation and advancement of overt stroke. Discontinuation of transfusions within the STOP 2 trial was additionally connected along with a increasing incident of implied cerebral infarcts, recognized in 3 of 37 patients (8.1%) in the continued-transfusion group in comparison with 11 of 40 (27.5%) in the transfusion-halted group. Additionally current research indicates that SCD patients may also be vulnerable to silent cerebral infarcts. An organization between declining vasculopathy revealed by magnetic resonance angiography and advanced overt and silent infarcts on magnetic resonance imaging discovered. Considerably intense magnetic resonance imaging assessment could be indicated, which could cause more patients with SCD getting addressed with chronic transfusion.

Common chronic transfusion methods consist of ST or RMPET. The objective of treatment therapy is to scale back the haemoglobin S amount possibly by diluting the blood (ST) or by eliminating and exchanging the blood with non-sickle haemoglobin (RMPET). In order to avoid additional brain trauma, the objective of transfusion treatment therapy is to reduce the haemoglobin S measurement to lower than

30% using a routine basis, commonly along with a regular transfusion treatment. There are various large centres that erythrocytapheresis which happens to be regarded as the suitable technique if available. We serve more than 200 families, with only 10 individuals demanding chronic transfusion therapy. In our study, it is established which transfusion technique was actually suitable for every individual for obtaining the hematologic variables of lower haemoglobin S measurement. In the study we assessed the degree of nursing time for every procedure and which technique is ideal by patients.

METHODS:

We employed a potential observational cohort design to analyse our objectives. Nine of ten chronically transfused individuals had been entitled to the research.

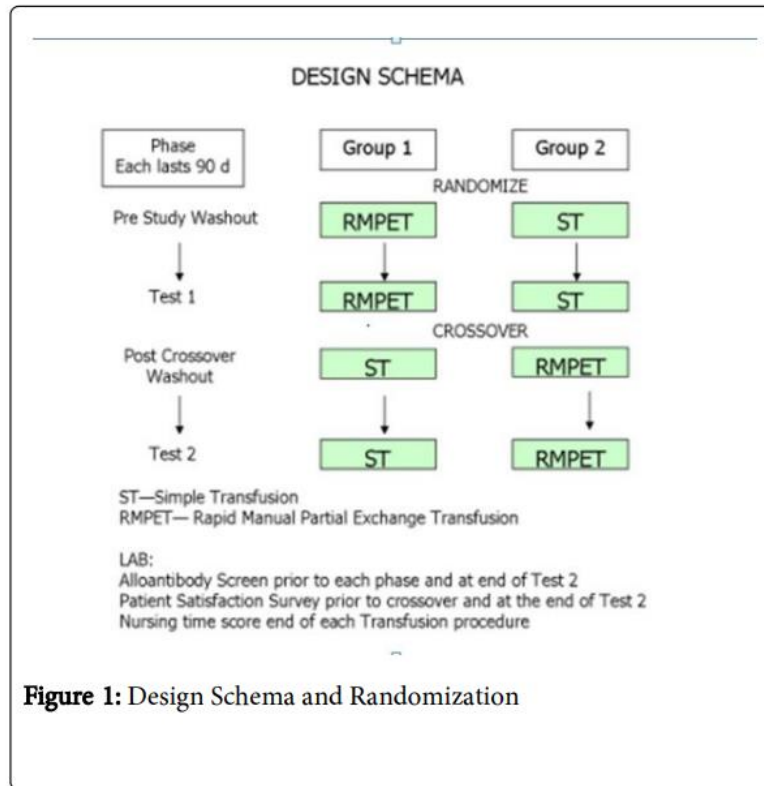
Inclusion Criteria

Our inclusion criteria were patients relating to the ages of 3 and 25 years, identified as having haemoglobin SS or S Beta Thalassemia currently obtaining chronic transfusion treatment for stroke protection by getting a Lansky play score of one hundred percent or if more than sixteen years old Karnofsky score of one hundred percent.

Exclusion Criteria

Exclusion criteria were significantly more than 2 strokes along with a adjusted Rankin score >3, a diagnosis of haemoglobin SC disease or chronic transfusion treatment for priapism. One patient obtaining chronic transfusion with three past strokes was omitted through the study.

As a result of quite limited sample size, a crossover design study was developed in order that each individual supported as its own control. After right IRB affirmation and permission to review, the 9 patients were randomly allocated by dazzled cover to get either the RMPET or ST. A three-month groove period was adopted before data arrangement. During that time period patients obtained the mode of transfusion that they were randomized. After collection of data, a second washout period occurred post crossover before a second set of data was collected. Each patient received three transfusions of each type. Thus six months of straight transfusion, followed by 6 months of RMPET transfusion: or vice versa dependent on the random assignment. The design schema is presented on Figure 1.



DATA COLLECTION:

Data collection incorporated dates of red blood cell transfusion, gender of patients, weight and age of patient, similarly the height, Haemoglobin S quantification pre and thirty minutes post transfusion, type of transfusion (RMPET or ST), baseline haemoglobin/haematocrit, blood volume, and all antibodies presence. Form and cross-match with extensive antigen phenotype happens prior to transfusion. Time specified by nursing to execute the RMPET was as opposed to time required for directly transfusion. We accumulated patient satisfaction studies for every sort of process carried out.

The process for simple transfusion ended up being the volume of transfuse based on blood on weight (10-15 mL/kg). The process for prompt manual limited exchange transfusion (RMPET) has also been weight based. For patients <50 kg, individual aliquots of blood removed and normal saline transfused was adjusted to 10 mL/kg. For patients weighing >50 kg, 500 mL of blood is eliminated, in addition to 500 mL of normal saline, then a second aliquot 500 mL of blood is eliminated, and two units of PRBC are infused. In case the patient includes a big red blood cell weight, the described procedures had been recurring until 3 to 4 units of blood have already been effectively transfused. There is a thirty-second delay

time for equilibration to take place during the entire procedure with elimination of blood based on the patient or infusion of saline or packed red blood cells. Care was directed post transfusion to gauge for hyper viscousness and uphold haemoglobin between 10-12 gm/dL.

Data Evaluation

Prolonged variables were described by imply with standard deviation, median and 95% confidence intervals. Particular variables were revealed by volume or proportions. Recurring procedures ANOVA with covariates were utilized to evaluate the outcome variables involving the 2 methods. Both evaluations within the group and relating to the groups were carried out with regard to hematologic variables. Individual's t-test was operated to evaluate the nursing time passed between two techniques. The patient gratification survey was taken for every type of transfusion. The reactions ("very poor", "poor", "fair", "good" and "excellent") to surveys were utilized in 1 to 5 scales.

A weighted score was determined for every patient. For instance, we estimated a weighted score according to 5 points for each individual who said "excellent," 4 points for "very good," 3 points for "good" and so on. We then calculated the weighted reactions for every question and averaged these to get

the score. An individual's t-test or nonparametric technique (Wallis rank test) was placed on to evaluate the individual score of satisfaction relating to the two approaches to be aware of which method was popular with patients. Individual satisfaction surveys looked at satisfaction outcomes such as length of time for the transfusion method, time taken from school/work for preparatory lab work for transfusion and overall satisfaction with each method of transfusion was obtained.

RESULTS:

A Wilcoxon signed-rank test identified that there had not been a statistically important median difference between Haemoglobin S at the end of the transfusion, both approaches obtaining Haemoglobin S levels <30%. Indeed, patients obtaining ST had a comparable mean difference between their haemoglobin S quantification when compared with RMPET: ST (11.8667) to RMPET (11.5), $z=0.652$, $p=0.515$.

A Wilcoxon signed-rank test established that there had not been a statistically important median difference in Ferritin level. The ST individuals suffered comparable levels (2103.667) as compared to RMPET individuals (1956.00), $z=-1.362$, $p=0.173$. Accordingly, a Wilcoxon signed-rank test established that there was no statistically significant median difference between Blood Volume degrees either. The ST patients experienced similar levels (525.00) compared to RMPET patients (500.00), $z=-0.674$, $p=0.500$.

The ST patients had significantly less transfusion time in minutes (96.6667) as compared with RMPET patients (155.6667), $z=2.666$, $p=0.008$. There was not a statistically important difference in nurse satisfaction between the two methods of transfusion; nurses experienced similar levels in ST (4.00) of satisfaction compared to RMPET nurses (4.00), $z=-1.787$, $p=0.074$. However, patient satisfaction favoured the straight transfusion modality.

Subject	Age	Gender	Sickle cell type
1.	9 years	Male	SS
2.	20 years	Male	SS
3.	8 years	Female	S Beta °Thalassemia
4.	18 years	Female	SS
5.	10 years	Male	SS
6.	15 years	Female	SS
7.	23 years	Male	SS
8.	4 years	Male	SS
9.	21 years	Female	SS

Table 1: Study subject description and age at consent to study.

CONCLUSIONS:

In this small sample of 9 chronically transfused patients, there was a lack of statistically significant difference in the haemoglobin S quantification according to the end of the 2 transfusion approaches utilizing a crossover design line of approach. We have opted to change our transfusion practice to

straight transfusion and not RMPET which is more time consuming and does not achieve any greater difference in lowering haemoglobin S levels. Patients have more satisfaction with the straight transfusion method because it takes less time. While our nursing staff did not have a statistically significant result in the study for their satisfaction with either method, all

were appreciative of the shorter transfusion times using straight transfusion (verbally reported).

We have carried on to keep track of our patients for 12 months post the final outcome of the research and have discovered our centre's attachment to straight transfusion and strict blood volumes is going to continue to demonstrate haemoglobin S quantification post transfusion to contain at getting ready to transition the eldest patients (>26 years) to the adult ambulatory infusion centre who happens to be only competent in straight transfusion. Despite the fact that ferritin levels have not been our main outcome, there was no difference in those levels between the two groups and transfusion studies of longer duration have not found large difference. We believe that strict adherence to an iron chelation regimen will enable our older patients to have success with the transition of care and hold their ferritin levels.

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