A study on prophylactic platelet transfusion in dengue patients

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Background :

Dengue viral infection is a major public health problem in developing tropic countries. Thrombocytopenia and bleeding manifestations are commonly associated with dengue patients. The need for platelet transfusion in dengue patients is not clearly defined in them. This study aims at evaluating the effects of prophylactic blood transfusion in dengue patients.

Materials and methods :

About 267 seropositive dengue patients with platelet counts < 20,000/cumm were randomized into two groups. Group A had 135 patients who received prophylactic blood transfusion and group B which had 132 patients who did not receive prophylactic blood transfusion. The outcomes were studied and compared for statistical significance.

Results :

The patients who received prophylactic blood transfusion did not had a statistically significant reduction in major and minor bleeding manifestations , transfer to Intensive Care Unit or recovery from thrombocytopenia.

Conclusion :

Prophylactic blood transfusion have no role in treatment of thrombocytopenia in adult dengue patients.

Key words : Dengue , Thrombocytopenia , Prophylactic transfusion, Platelet transfusion.

Background and introduction :

Dengue is a major public health problem in developing countries especially in the subtropical areas across the world. WHO had classified dengue as the most important vector borne disease[1] . Dengue is endemic in more than 100 countries but most of the patients who are affected by dengue live in Asia-Pacific region of the world[2,3]. There is a 30 fold increase in the number of Dengue cases over the past 50 years[4]. Urbanisation , industrialisation and abnormal weather changes contribute to this[5,6]. As per the global estimates Dengue causes more than 20,000 deaths annually[7-9]. This study is done to analyse outcome of prophylactic platelet transfusion in adult Dengue patients.

Materials and methods.

Inclusion criteria

1.Serological positive Denge patients.

2.Age between 18 to 65 years

3. Platelet count< 20,000 / cumm

4. No bleeding manifestation.

Exclusion criteria:

1. Patients on antiplatelet or anticoagulation drugs

2. Patients with pre existing platelet disorders or coagulation disorders

3. Patients with major comorbid illness like renal failure, decompensated liver disease etc.

4. Denge patients with shock.

Outcomes to be measured:

1. Occurance of new major and minor bleeding.

2.Need for transfer to ICU.

3. Time for recovery from thrombocytopenia.

This observational study was conducted in Government Thiruvannamalai medical College hospital between the period of December 2021 to September 2022. Fever patients with positive serology for dengue were included in the study. Patients who are positive for either NS1 antigen or IgM anti dengue antibodies by ELISA were considered as seropositive. Patients diagnosed by rapid card method or positive only for IgG antibodies are not included in the study. Seropositive dengue patients with platelet count of < 20,000 / cumm were chosen. Detailed history was taken and clinical examination was done. Those patients with no clinical bleeding manifestations were only considered.

267 patients who were positive for dengue serology, with platelet count<20,000 / cumm and without any clinical bleeding manifestations were taken for the study. The 267 patients were randomised for Age,sex , platelet count and divided into two groups . Group A had 135 patients and group B had 132 patients.

Group A patients were given prophylactic platelet transfusion . 5 units of Random Donor Platelets were transfused for all of them. Platelet transfusion was repeated if the platelet count was below 10,000 / cumm on the subsequent days.

Group B patients were given only supportive care and were not given platelet transfusion. They were given platelet transfusion only if they develop bleeding manifestations during follow up.

Both the groups were closely followed up with daily platelet count and were monitored for major and minor bleeding manifestations. Hourly blood pressure, pulse , temprature and urine output were monitored. Patients with any of the following were transferred to Intensive care unit.

1. Systolic BP below 90 mm Hg

2. Pulse rate above 120/min

3. Urine output below 200 ml in 6 hrs

4. Patients with any of the warning signs like cyanosis,Abdominal pain or tenderness,Persistent vomiting,clinical fluid accumulation,Lethargy or restlessness,Laboratory finding of increasing HCT .

The following outcomes were studied.

1. Occurrence of new major bleeding

2. Occurrence of minor bleeding.

2.Need for transfer to ICU.

3. Time for recovery from thrombocytopenia(platelet count> 1,00,000/cumm)

The occurrence of major and minor transfusion reaction among the Group A patients were also documented. The values of both the groups were compared and analysed for statistical significance using unpaired T test and Chi square test.

Results :

Table 1 : Demographic data and disease severity .

Variables	Transfused (N=135)	Not transfused (N=132)	P value
Age (years)	44.7 (16.89)	43.92 (16.22)	0.7009
Sex (M/F)	85/50	76/56	0.8091
Body mass index (Kg/m^2)	22.9 (2.40)	22.69 (2.38)	0.3647
Duration of fever (days)	5.16 (1.9)	5.05 (1.68)	0.6166
Platelet count (per cumm)	11631 (5503)	10827 (5194)	0.2210

Table 2 : Clinical outcomes

Outcomes	Transfused (N=135)	Not transfused (N=132)	P value
Incidence of major bleed	18/135	22/132	0.4454
Incidence of minor bleed	44/135	57/132	0.0744
Need for ICU transfer	36/135	43/132	0.2345
Time for recovery from Thrombocytopenia (days)	4.04 (1.93)	4.21 (1.46)	0.4253
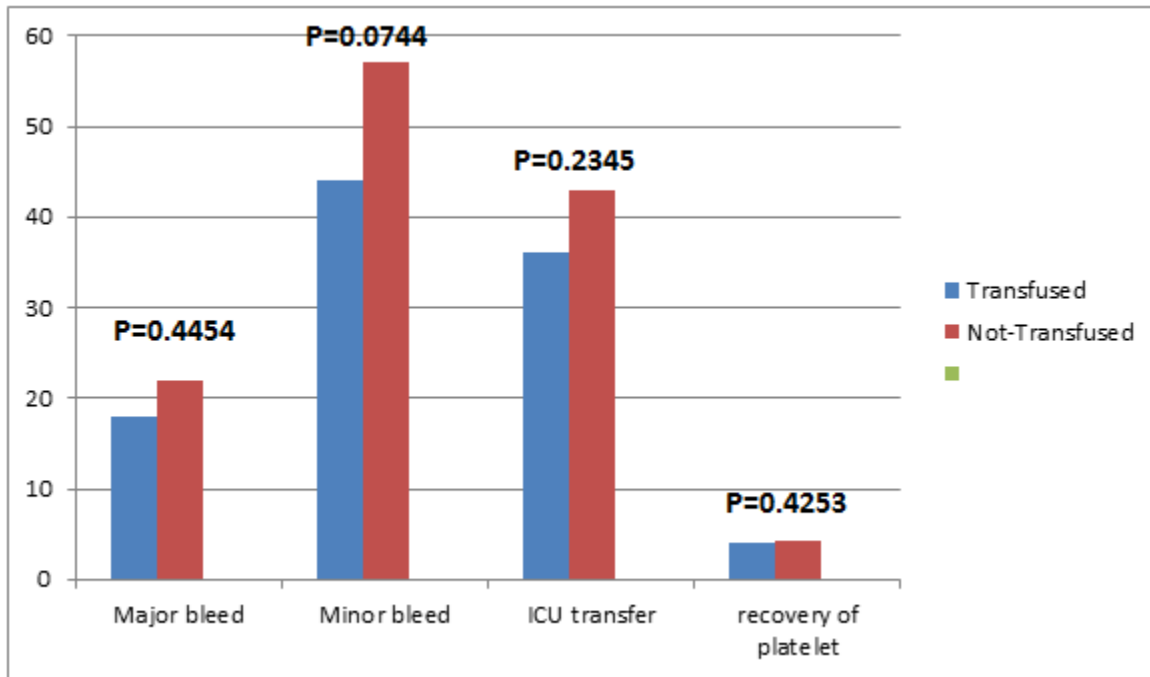
Discussions :

The clinical features of Dengue varies from mild fever to life threatening shock[10]. Thrombocytopenia is one of the diagnostic feature of Dengue hemorrhagic fever[11,12] . The correlation between thrombocytopenia and the severity of Dengue is not clear[13]. Decrease in platelet production and increased immune mediated platelet destruction both contribute to thrombocytopenia in Dengue patients. In addition hypofibrinogenimia also contribute to the bleeding manifestations[14]. The degree of coagulopathy or thrombocytopenia do not predict the bleeding tendency[15,16].

Platelet transfusion for managing thrombocytopenia is widely practiced in dengue management in our country[17-21]. Most of the studies have investigated the platelet transfusion in dengue patients do not find any positive role for it. Few studies have even come out with the hazards of prophylactic platelet transfusion[21,22].

In our study the incidence of major and minor bleeding manifestations in the transfused group is 18 and 44 respectively. This when compared with the not-transfused group (22 major bleed , 57 minor bleed) appears to be low but are not statistically significant . 36 patients from the transfused group were shifted to ICU during the course of treatment whereas 43 patients from the not-transfused group needed to be shifted to ICU. This is also not significant. The time taken for recovery from thrombocytopenia also does not vary significantly among the groups .

Conclusion :

Prophylactic platelet transfusion has no advantage in the treatment of adult dengue patients with platelet count < 20,000/ cumm . Considering the cost and availability of blood products and the risk associated with transfusion reactions prophylactic platelet transfusion is not indicated.

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