

Study on the effectiveness of transfusion program in dengue patients receiving platelet transfusion

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Abstract

Background: Dengue infection results in a spectrum of clinical syndromes ranging from a mild flu-like illness to life-threatening dengue shock with bleeding and multi-organ failure. The present study was conducted to assess the effectiveness of transfusion program in dengue patients receiving platelet transfusion. **Material and methods:** The present study was conducted to assess the effectiveness of transfusion program in dengue patients receiving platelet transfusion. 200 clinically suspected cases of dengue were included in the study. Cases who were positive for dengue serological tests were included in the study. The age of the patient, duration of fever before admission, result of the dengue serological test, haematocrit and platelet count on admission and during hospitalization, presence of haemorrhagic manifestation like petechiae, haematemesis, melena, gum bleeding and epistaxis and admission of platelet transfusion were recorded and analysed. **Results:** In the present study 200 clinically suspected dengue cases, 184 cases were positive for dengue serological tests. Among 184 serologically positive dengue cases, 156 cases were DF, 26 cases were DHF and 2 cases were DSS. 98 patients were males and 86 were females. 119 of the 156 cases with DF required platelet transfusion. Similarly 19 out of 26 DHF cases and both DSS cases required platelet transfusion. Information regarding clinical recovery or on post transfusion platelet increment was available in 155 cases out of 180 cases, because 4 patients died during hospitalization. **Conclusion:** The present study concluded that 184 cases were positive for dengue serological tests. 119 of the 156 cases with DF required platelet transfusion. Similarly 19 out of 26 DHF cases and both DSS cases required platelet transfusion. Clinical recovery or on post transfusion platelet increment occur in 155 cases out of 180 cases, because 4 patients died during hospitalization.

Keywords: transfusion, platelet, dengue.

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Introduction

Dengue is the most prevalent mosquito borne viral disease infecting over 50 million people each year[1]. Dengue is viral disease caused by dengue virus with four serotypes DEN-1 to DEN-4 of flavivirus family transmitted through Aedes Aegypti mosquito[2]. Its clinical symptoms vary from mild fever to life-threatening shock[3]. Thrombocytopenia is a prominent feature of dengue infection[4]. A platelet count of less than 100,000/ μ l is one of the diagnostic criteria for dengue hemorrhagic fever[5]. Prophylactic platelet transfusions are given in dengue fever with thrombocytopenia to prevent hemorrhagic complications. Although the use of prophylactic platelet transfusions is increasing in countries where dengue is endemic, it is associated with risks and has financial implications[6]. The decision to transfuse platelets is based on several factors including estimation of platelet count and function, cause of thrombocytopenia, the status of coagulation system, the presence or likelihood of bleeding and the risks of transfusion[7]. The present study was conducted to assess the effectiveness of transfusion program in dengue patients receiving platelet transfusion.

Material and methods

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Before the commencement of the study ethical approval was taken from the ethical committee of the institute and informed consent was taken from the patient. 100 clinically suspected cases of dengue infection who had come with a requisition for platelet transfusion to the blood bank were included in the study. Cases who were positive for dengue serological tests were included in the study. Patients were identified as suspected dengue cases if they had acute febrile illness with one of the following symptoms: myalgia, arthralgia, headache, retro-orbital pain, bleeding, shock or low platelet count. All clinical findings and laboratory investigations were recorded from the time of admission to the time of discharge. The age of the patient, duration of fever before admission, result of the dengue serological test, haematocrit and platelet count on admission and during hospitalization, presence of haemorrhagic manifestation like petechiae, haematemesis, melena, gum bleeding and epistaxis and admission of platelet transfusion were recorded and analysed. Guidelines for platelet transfusion were utilized as the criteria to assess the effectiveness of platelet transfusion during the study.⁸ Laboratory tests to confirm dengue infection includes haemagglutination inhibition (HI) test and the IgM dengue blot test. The HI antibody titre was performed in paired sera, while the IgM dengue blot tests were performed on the acute sera only.

Results

In the present study 200 clinically suspected dengue cases, 184 cases were positive for dengue serological tests. Among 184 serologically positive dengue cases, 156 cases were DF, 26 cases were DHF and 2 cases were DSS. 98 patients were males and 86 were females. 119 of the 156 cases with DF required platelet transfusion. Similarly 19 out

of 26 DHF cases and both DSS cases required platelet transfusion. Information regarding clinical recovery or on post transfusion platelet

increment was available in 155 cases out of 180 cases, because 4 patients died during hospitalization.

Table 1: Dengue patients with thrombocytopenia and bleeding who received platelets transfusion

Platelet count	Platelet count (*10 ³)							Total
	<10	11-20	21-30	31-40	41-50	51-100	>100	
No. of patients with								
Petechiae	0	19	11	0	0	0	0	30
Haematemesis	2	1	1	0	0	0	0	4
Malaena	1	0	0	0	0	0	0	1
Gum bleeding	4	2	2	0	0	0	0	8
Epistaxis	2	1	1	0	0	0	0	4
No. of dengue patients	8	39	65	19	4	3	46	184

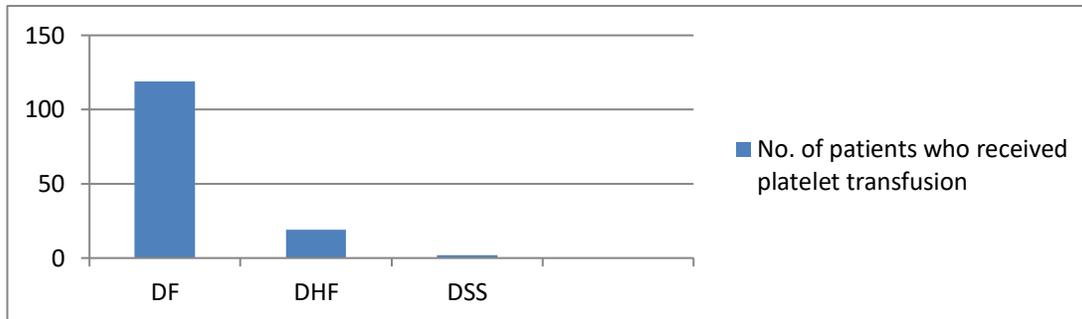


Fig 1: No. of patients who received platelet transfusion

Discussion

Pathogenesis of thrombocytopenia in dengue infection is not fully known and may be multifactorial. Immune-mediated destruction of platelets is considered to be the most important factor. For example, one study found presence of antibodies directed against dengue virus nonstructural protein 1 (NS1) that showed cross-reactivity with human platelets and endothelial cells, which lead to platelet and endothelial cell damage and inflammatory activation[9].

In the present study 200 clinically suspected dengue cases, 184 cases were positive for dengue serological tests. Among 184 serologically positive dengue cases, 156 cases were DF, 26 cases were DHF and 2 cases were DSS. 98 patients were males and 86 were females. 119 of the 156 cases with DF required platelet transfusion. Similarly 19 out of 26 DHF cases and both DSS cases required platelet transfusion. Clinical recovery or on post transfusion platelet increment occur in 155 cases out of 180 cases, because 4 patients died during hospitalization. Makroo et al. studied 225 serologically confirmed cases and classified 199 (88.4%), 21 (9.3%) and 5 (2.2%) patients as DF, DHF, DSS respectively which is similar to the present study[10]. A study conducted in four tertiary level hospitals of Delhi observed that 73.5% of patients with dengue hemorrhagic fever and 48.7% of dengue fever classified as per WHO guidelines were given platelet transfusions[11]. Makroo et al[10] studied 242 dengue cases and categorized the dengue cases into four categories based on the platelet count:

1. High risk: Transfusion should be given top priority for the patients whose platelet count <0.2x10⁵/mm³.
2. Moderate risk: Those patients whose platelet count is >0.2x10⁵/mm³ but < 10x10⁵/mm³ should be given platelet transfusion if they have haemorrhagic manifestation.
3. Low risk: If the platelet count is >0.4x10⁵/mm³ and <10x10⁵/mm³ for the age and sex should be observed carefully but should not receive platelet transfusion.
4. No risk: If the platelet count is >10x10⁵/mm³ they should never be transfused with platelet and should be managed conservatively with supportive therapy.

Conclusion

The present study concluded that 184 cases were positive for dengue serological tests. 119 of the 156 cases with DF required platelet

transfusion. Similarly 19 out of 26 DHF cases and both DSS cases required platelet transfusion.

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