



Thrombocytopenia and Platelet Transfusion in Patients With Dengue Infection

KEYWORDS

Dengue, thrombocytopenia, transfusion

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ABSTRACT *Introduction-* Thrombocytopenia is a very common presentation in dengue infection and bleeding is major cause of the morbidity in the same. Hence platelet transfusions are frequently used. The aim of present study was to analyze platelet transfusions used in patients admitted with dengue fever in our institute.

Materials and methods- This was a retrospective analysis of adult patients with dengue fever. Bleeding manifestations, complete blood count were noted and analysed. Patients who received platelet transfusions for thrombocytopenia were studied in detail.

Results- Total 261 patients were included in this study, of which 85.4% had thrombocytopenia, 14.5% had bleeding manifestations. Total 26 patients received platelet transfusions of which 8(30.8%) received inappropriate transfusions.

Conclusion- Thrombocytopenia is very common feature of dengue and inappropriate use of platelet transfusion is high among these patients.

Introduction-

Dengue is a vector borne disease caused by bite of Aedes mosquito. Dengue epidemics are major public health concern in tropical and subtropical countries. In general, it is a self-limiting acute febrile illness. Severe forms of dengue are characterized by hemorrhagic manifestations, hypovolemia and shock. Thrombocytopenia is a common presentation in acute dengue infection. The cause of bleeding in dengue fever is multi-factorial like hepatic derangement, coagulopathy as well as due to severe thrombocytopenia.(1) Despite this, platelet transfusion is frequently used in patients with dengue fever with thrombocytopenia.

The aim of present study was to analyze platelet transfusions used in patients admitted with dengue fever in our institute.

Materials and methods-

This was a retrospective analysis of patients of dengue fever admitted to our hospital, Smt. Kashibai Navale Medical College & General Hospital, Pune, Maharashtra, from Jan 2014 to Dec 2014.

We studied all adult patients (age > 18yrs) admitted with dengue. Diagnostic criteria for dengue infection were anti-dengue IgM and/ or NS1 antigen positivity. Those patients with malaria and enteric fever co-infection were excluded from the study. Patients' demographic profile, bleeding manifestations, complete blood count were noted and analyzed. The least platelet count recorded during admission was considered for the study. Thrombocytopenia was defined as platelet count <1,50,000/cmm. Patients who received platelet transfusions for thrombocytopenia were studied in detail.

Results-

Total number of patients with dengue infection included in our study were 261.

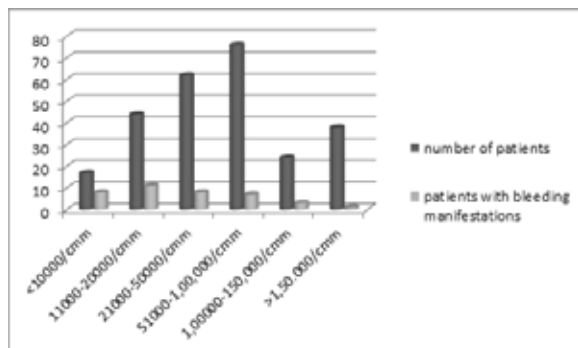
Out of which 167 (64%) were males and 94(36%) females. Our patients were between the age group of 18 to 65. Mean age in the study group was 31 years. Average duration of hospital stay in these patients was 6.4 days. All patients had fever as the presenting symptom.

Among these cases, 107 patients tested positive for anti-dengue IgM antibody, 147 patients had positive NS1 antigen test and 27 patients were detected to have both anti-IgM antibody and NS1 antigen positive result. 101 patients had leucopenia (TLC<4000). 223 patients out of the 261 cases had thrombocytopenia (85.4%)

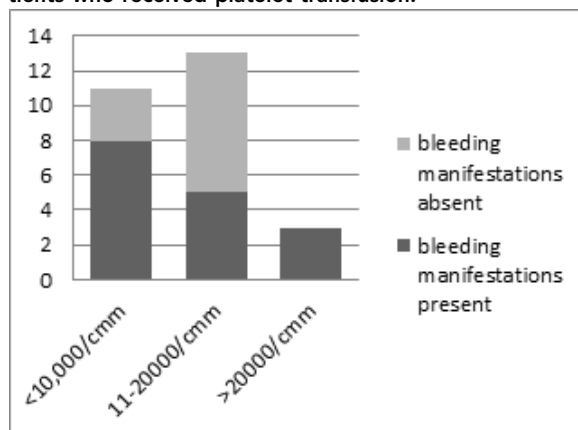
Further, depending on the severity of thrombocytopenia, we found that 17 patients had severe thrombocytopenia (<10000), 44 patients had platelet count between 10000-20000, 62 patients had platelet count between 20000-50000, 76 patients had platelet count ranging from 50000 to 100000, 24 patients were found to have mild thrombocytopenia between 100000 to 150000.

Bleeding manifestations were observed in 39 (14.5%) patients. Out of these gastrointestinal bleed in the form of haematemesis, melena, per rectal bleeding, was observed in 19 patients. Other forms of bleeding manifestations observed in these patients were epistaxis (4), gum bleeding (9), haematuria (6), petechial rash and ecchymosis (5) and sub-conjunctival hemorrhage (3).

We further divided the subgroup of patients with bleeding manifestations (39) depending on the degree of thrombocytopenia and found that 8 patients had platelet count <10000, 11 patients had platelet count 10000-20000, 8 had platelet count 20000-50000, 7 patients had platelet count 50000-100000 and 3 had platelet count between 100000-150000. Only 1 patient had an episode of melena and per rectal bleeding despite his platelet count being normal.(Fig.1)

Fig. 1- Correlation of bleeding manifestations and platelet count

It was observed that 26 patients had received platelet concentrate transfusion. Out of these 11 patients had platelet count <10000 and bleeding manifestation was present in 8 of them. 13 patients who received platelet concentrate had platelet count between 11000-20000, out of them bleeding was present in 5 patients. 3 patients received platelet transfusion with platelet count >20000, but all of them had bleeding manifestations.(Fig.2) Only 1 patient received packed cell volume along with platelet transfusion, in view of anemia (Hb-6.8gm%). No patient showed transfusion associated adverse reaction.

Fig.2- Correlation of bleeding manifestations and patients who received platelet transfusion.

Discussion-

Thrombocytopenia is one of the common manifestation of dengue infection. In our study group we found 85.4% patients with thrombocytopenia. This finding is comparable with the findings of other studies by Makroo et al and Chairulfatah et al ,who found similar incidence of 84.9 % and 83% (2,3). Cause of thrombocytopenia in dengue fever is multifactorial. It may be because of bone marrow suppression as well as immune complex mediated platelet destruction. Cross reactivity of antibodies against NS1 antigen of dengue virus with human platelets causes platelet and endothelial cell damage causing inflammatory activation. (4) Spontaneous recovery in platelet count is seen in almost all patients.

Several studies stated that severity of thrombocytopenia does not correlate with the bleeding.(5,6).And cause of bleeding in dengue is multifactorial , thrombocytopenia can not be attributed as a sole cause for the same. Deranged coagulation profile is another important cause for bleeding in dengue particularly in dengue hemorrhagic fe-

ver and dengue shock syndrome. Coagulopathy is mainly caused by increase in tissue plasminogen activator, cytokine production (7) and plasma leakage due to increase vascular permeability. In our study we found that 14.5% patients had hemorrhagic manifestations and of these 39 patients 48% patients had platelet count < 20,000/cmm. This supports that risk of bleeding is more with low platelet count. This is also in accordance with the study by Kulkarni et al who found to have 69% patients with hemorrhagic manifestations with platelet count less than 20000/cmm. (8) . But we also found that 10% patients had bleeding episodes with platelet count > 1,00,000/cmm. This necessitates the screening of coagulation profile before platelet transfusion.

Prophylactic platelet transfusion is defined as platelet transfusion given in absence of clinical bleeding to prevent bleeding. Ineffectivity of prophylactic platelet transfusion has been reported in various studies.(6,9,10) Study in pediatric group , instead, reported fluid overload in prolonged hospital stay due to transfusions. (6). There is also a risk of transfusion associated adverse reaction . Muhamad et al reported 7% patients with adverse reaction due to transfusion. (11)

According to the Directorate of Health Services (DHS) guideline , prophylactic platelet transfusion is indicated when platelet count <10000/cmm. The thrombocytopenic patients with more than this count can receive platelet therapy if associated with hemorrhagic manifestations. (12) In our study , total 26 patients received platelet transfusions. Of which 8(30.8%) patients had clinical bleeding and platelet count less than 10,000/cmm. 3 (11.5%) received prophylactic platelet transfusion due to platelet count less than 10000/cmm. 30.8% thrombocytopenic with platelet count more than 10000/cmm received platelet transfusions had bleeding manifestations. However 30.8% patients received inappropriate platelet transfusion. During epidemics of dengue there is intense social pressure on treating physicians by the patients and relatives. This frequently leads to administration of platelet transfusion even in those patients in whom it is medically not indicated . This in turn creates heavy burden on blood bank services. This adds to the perennial shortage of blood components especially platelets during dengue outbreaks.

Being a retrospective analysis with a small sample size, our study has many limitations.

Conclusion-

Thrombocytopenia is a very common feature of dengue fever. Bleeding manifestations are seen with all degrees of thrombocytopenia. Inappropriate use of platelet transfusion is high. Hence strict adherence to the guidelines for the platelet transfusion is necessary

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