

Use of blood products and steroids in the management of Dengue at Kauvery Trichy Hospitals: A clinical Audit

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Background

Dengue fever has emerged as a global public health problem in recent decades. The clinical spectrum ranges from dengue fever to dengue haemorrhagic fever and dengue shock syndrome. The current study is aimed to highlight the use of blood products and steroids in dengue management.

Methods

We have retrospectively analysed dengue patients who were admitted to our hospital between the time period September 2021 to September 2023. We have divided the patients into two groups respectively:

Group I: Admissions from 2021 September to 2022 September - 41 patients

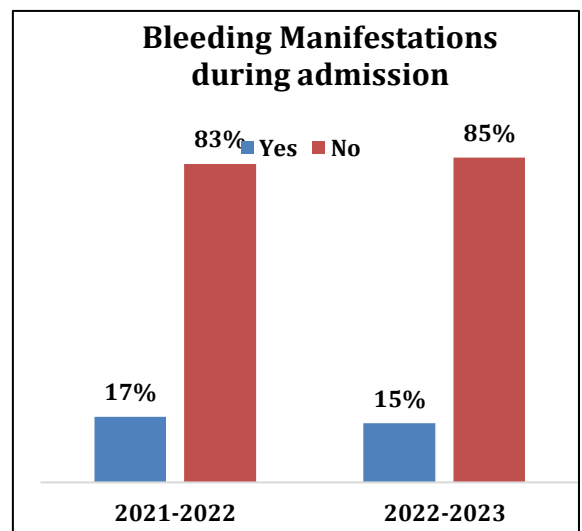
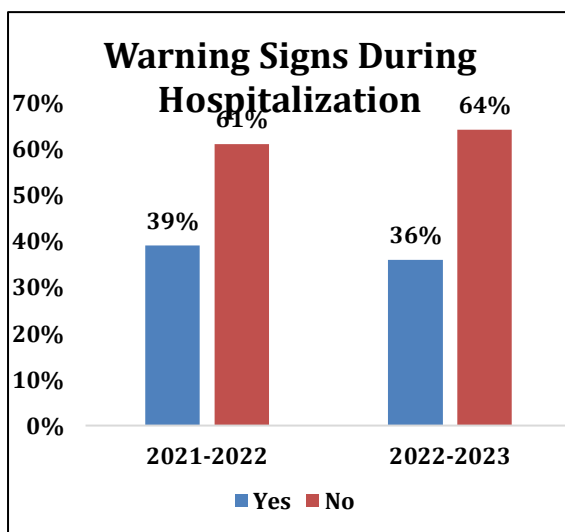
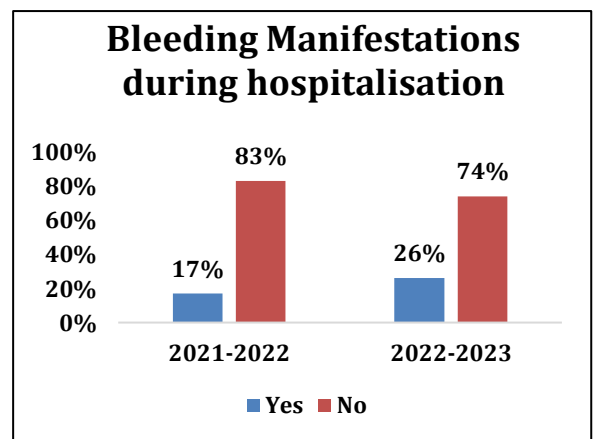
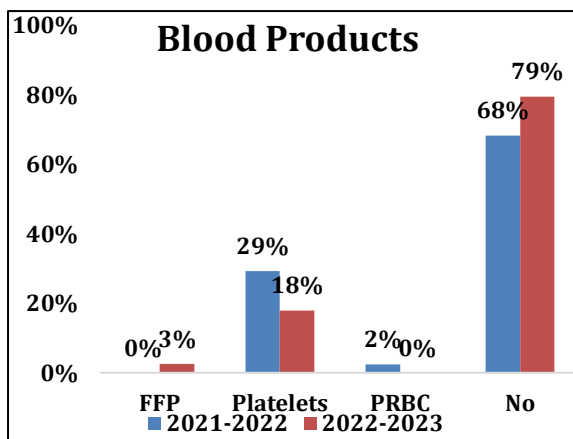
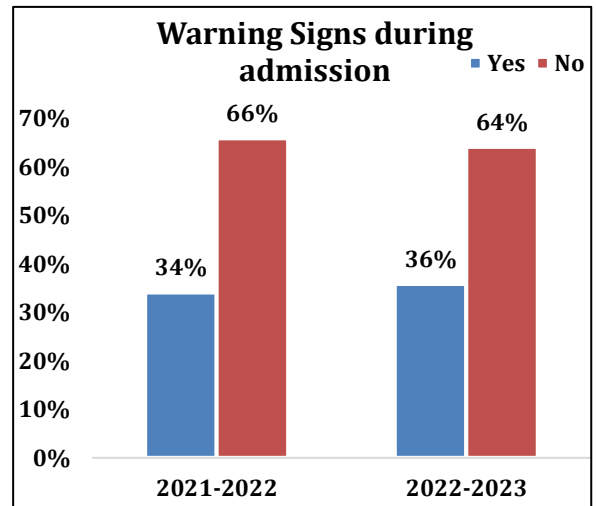
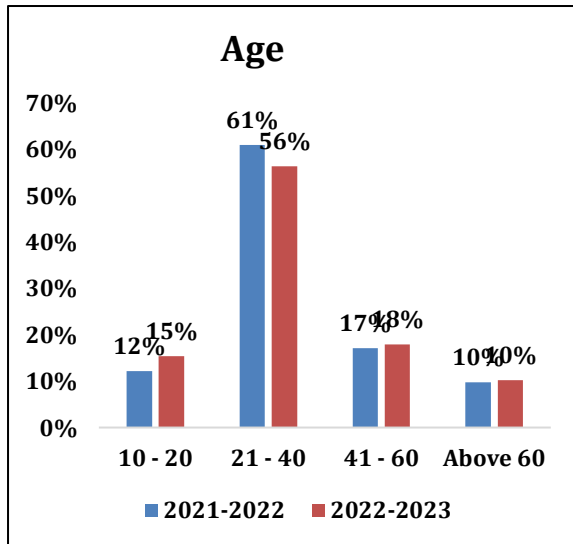
Group II: Admissions from 2022 October to 2023 September - 39 patients

We have referred the WHO guidelines, NVBDCP guidelines, CDC guidelines regarding the use of steroids and blood products in dengue patients.

Results

Among 80 patients studied most of the patients belonged to age group between 21–40 years of age-59% (47 patients). About 35% of patients had warning signs and 16% of patients presented with bleeding manifestations at the time of admission. About 39% of patients (15 cases) in group I, 36% of patients (14 patients) in group II developed warning signs. About 17% (6 patients) in group I, 26% (9 patients) in group II developed bleeding manifestations during their course in hospital.

29% of patients (12) in group I, 18% of patients (8) in group II required platelet transfusion due to severe thrombocytopenia and bleeding symptoms. Only one patient required Fresh frozen plasma transfusion and one patient required packed red blood cell due to severe anaemia.



Discussion

- 1) According to WHO, prophylactic platelet transfusion for severe thrombocytopenia in otherwise hemodynamically stable patients is not necessary. Patients with risk of major bleeding are patients who have prolonged or refractory shock, hypotensive shock, renal failure, liver failure, persistent metabolic acidosis, who have pre-existing peptic ulcer disease, who are on anti-coagulants, patients with haemolytic conditions, patients with any form of trauma.
- 2) According to WHO, patients at risk of severe bleeding may have persistent or over bleeding in the presence of unstable hemodynamic status, regardless of the haematocrit levels. A decrease in haematocrit after fluid resuscitation together with unstable hemodynamic status, refractory shock that fails to respond to fluid resuscitation of 40 to 60 ml/kg, hypotensive shock with low/normal haematocrit before fluid resuscitation are important to recognize and manage and so is persistent and worsening metabolic acidosis. Systolic BP need to be maintained, especially in those in with severe abdominal tenderness and distension.
- 3) To treat haemorrhagic complications, WHO advises that 5–10ml/kg of PRBC or 10–20ml/kg of whole blood can be given at an appropriate rate. Good clinical response includes improving hemodynamic status and acid base balance.
- 4) According to NVBDCP, thrombocytopenia with severe active bleeding with profound shock is to be treated with whole blood, and then if required, platelet transfusion.
- 5) CDC criteria recommends several do's and don'ts in dengue management - don't give steroids, don't give platelets transfusion for low platelet count, don't give half NS, don't assume IV fluids are necessary, do tell patients when to return, do recognize critical periods, do closely monitor fluid intake and output, vital signs and haematocrit level, recognize and treat early shock, administer colloids for refractory shock, give packed red blood cells, and whole blood for clinically significant bleeding.

Review of literature

- 1) In a study conducted by *Anshula Tayal* and others, it was stated that prophylactic platelet transfusion had no significant benefit over supportive care alone, and it did not prevent bleeding or hasten platelet recovery. But many units consider transfusing platelets once the count is less than 10000/mm³. [1]
- 2) In a study done by *Paramjit Kaur* it was stated that platelet transfusion neither prevented progression to severe bleeding nor reduced time to cessation of bleeding nor was often associated with severe adverse reactions. Most units do transfuse platelets if the patient has severe acute mucosal bleed, which is not controlled with supportive care. [2]
- 3) From the study done by *Priya Logia* and others, we learn that identifying patients with dengue infection who are at risk of bleeding is crucial for patient management. The presence of independent predictors (fever, increased SOFA score, increased aPTT) indicates bleeding tendency. A predictive score above 4, generated by including three variables, can be utilized for risk stratification. These findings, complemented with clinical judgement in reviewing daily clinical and laboratory data, can identify low-risk patients who are safe not to admit to the ICU. [3]
- 4) *Rathnasiri Bandara*, cite strong supportive evidence for actions of corticosteroids in dengue pathology at receptors and molecular levels. [4]
- 5) Another study by the same author states that it is highly unlikely that use of corticosteroids in dengue treatment results in viremia, or any other significant adverse effects or complications. The effectiveness of corticosteroids in dengue is depended upon sustained and maintained therapeutic blood levels of corticosteroids for an adequate duration and using a steroid with high receptor affinity. Further clinical trials are needed, using a steroid with higher receptor affinity. [5]
- 6) The MIDWAS study conducted by *A. Bhalla* states that single dose of methyl prednisolone prevented the progression of dengue fever with warning signs to DHF/DSS, enabled higher rise in platelet counts, caused earlier resolution of alarm signs, reduced the duration of

hospital stay and also decreased the need of platelet transfusion.[6]

Consensus

Blood product transfusion should be given in patients with clinically significant bleeding manifestations. Platelets can be transfused in patients with significant thrombocytopenia [$<10000/\text{mm}^3$] if bleeding is anticipated. Steroids maybe used in patients with severe dengue or dengue haemorrhagic fever or plasma leakage syndrome. Since response to steroids may differ in individual patients, clinical judgement is necessary before steroid administration.

References

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- 2) Kaur P, Kaur G. Transfusion support in patients with dengue fever. Int J Appl Basic Med Res. 2014;4(1):8-S12
- 3) Logia P, Selvam V, Parasuraman V, Renuka MK, Rajagopalan RE. Predictors of Clinically Significant Bleeding in Thrombocytopenic Dengue Patients Admitted to Intensive Care Unit: A Retrospective Study. Indian J Crit Care Med. 2023;27(12):888-894.
- 4) S. M. Rathnasiri Bandara. Corticosteroid actions in Dengue immune pathology, a review arctical. CEGH Home. 2020;8(2):486-494.
- 5) Bandara SMR, Herath HMMTB. Effectiveness of corticosteroid in the treatment of dengue - A systemic review. Heliyon. 2018;4(9):00816.