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CASE REPORT

A Case Report of Early Diagnosis and Supportive Nutritional Management of Paediatric Dengue with Moderate Thrombocytopenia

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Abstract: Dengue fever is a global public health burden, particularly in tropical and subtropical regions where the Aedes mosquito vector thrives. This viral illness manifests with a spectrum of clinical presentations ranging from mild febrile illness to severe haemorrhagic fever and shock. A critical haematological feature often observed is thrombocytopenia, which poses significant risks for coagulopathy and bleeding complications in paediatric populations. This case study details the clinical trajectory of a 6-year-old female patient who presented with high-grade fever, myalgia, and vomiting subsequent to sylvatic exposure. Diagnostic evaluation confirmed dengue infection via NS1 antigen positivity, while concurrent thrombocytopenia was noted with a nadir of 85,000/µL. Differential diagnoses including enteric fever and malaria were systematically excluded through serological and microscopic analysis. The management strategy prioritized aggressive yet carefully monitored intravenous hydration coupled with a structured nutritional regimen rich in antioxidants and micronutrients presumed to support thrombopoiesis. The patient received a diet fortified with *Carica papaya* (papaya), *Punica granatum* (pomegranate), and Vitamin C-rich sources alongside standard antipyretic therapy. This conservative, non-transfusion-based approach resulted in a rapid normalization of platelet indices and complete clinical recovery within seven days. The successful outcome shows the role of early diagnosis, vigilance in monitoring haemodynamic parameters, and the potential adjunctive benefits of nutritional optimization in managing paediatric dengue with moderate thrombocytopenia, thereby reducing the reliance on blood product transfusions in haemodynamically stable patients.

Keywords: Arbovirus infection; Haematological parameters; Fluid resuscitation; Phytotherapy; Thrombopoiesis.

1. Introduction

Dengue fever is an acute mosquito-borne viral disease caused by one of four distinct serotypes of the Dengue virus (DENV-1 through DENV-4), belonging to the *Flaviviridae* family [1]. The primary vector, *Aedes aegypti*, has facilitated the rapid geographic expansion of the disease, making it the most prevalent arboviral infection worldwide [2]. In endemic regions such as South-East Asia, the disease exerts a considerable strain on healthcare systems, particularly during seasonal outbreaks [3]. The clinical course of dengue is dynamic, typically progressing through febrile, critical, and recovery phases. While the majority of infections are self-limiting, a subset of patients progresses to severe dengue, characterized by plasma leakage, respiratory distress, severe bleeding, or organ impairment [4].

A hallmark of the disease is thrombocytopenia, defined as a rapid decline in platelet count, which serves as a key indicator of clinical severity [5]. The pathophysiology governing this haematological dysregulation is multifactorial, involving direct bone marrow suppression by the virus, peripheral destruction of platelets via immune-mediated mechanisms, and enhanced platelet consumption due to endothelial activation and coagulopathy [6]. In paediatric patients, the physiological reserve is lower than in adults, making the rapid identification and management of thrombocytopenia essential to prevent the progression to Dengue Haemorrhagic Fever (DHF) or Dengue Shock Syndrome (DSS) [7].

Current management protocol given by the World Health Organization (WHO) emphasize supportive care, as no specific antiviral therapy exists. The cornerstone of treatment involves meticulous fluid management to maintain intravascular volume and tissue

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perfusion [8]. Moreover, there is growing scientific interest in the role of nutritional support and phytotherapeutic agents as adjunctive strategies. Various studies have explored the potential of dietary components, such as *Carica papaya* leaf extract and antioxidant-rich fruits, in accelerating platelet recovery, although large-scale clinical validation remains an area of active research [9]. This report describes a case of paediatric dengue with moderate thrombocytopenia managed successfully through a regimen of intravenous hydration and targeted nutritional support, reinforcing the efficacy of conservative management in preventing severe complications.

2. Case Presentation

2.1. Patient Profile and History

A 6-year-old female patient, residing in an urban setting in Hyderabad, Telangana, presented to the paediatric outpatient department with a primary complaint of high-grade fever persisting for three days. The fever was documented to reach peaks of 103°F and was associated with constitutional symptoms including generalized body aches, chills, rigors, and significant myalgia, particularly affecting the lower extremities. The parents also reported episodes of intermittent non-bilious vomiting. An epidemiological link was established through the patient's history, which revealed a recent excursion to a forested area as part of a school curriculum, suggesting potential exposure to sylvatic vectors. The patient had no significant past medical history, no known allergies, and was not on any chronic medication prior to the onset of the current illness. Family history was non-contributory to the present condition.

2.2. Clinical Assessment and Diagnostic Profiling

Upon physical examination, the patient appeared febrile and lethargic but was conscious and oriented. Vital signs recorded at admission included a temperature of 103°F, a pulse rate of 90 beats per minute, and a blood pressure of 100/70 mmHg, indicating haemodynamic stability despite the febrile state. Respiratory examination revealed normal vesicular breath sounds with a normal respiratory rate. The abdominal examination was benign with no evidence of hepatosplenomegaly. Dermatological assessment showed mild generalized erythema, but crucially, there were no petechiae, ecchymoses, or other overt signs of spontaneous bleeding. These findings are summarized in Table 1.

Table 1. Clinical Parameters During Admission

Parameter	Observed Value	Clinical Significance
Temperature	103°F	High-grade fever indicative of acute viremia
Blood Pressure	100/70 mmHg	Normotensive; no evidence of shock
Pulse Rate	90 bpm	Appropriate for febrile state; no tachycardia
Respiratory Rate	Normal	No respiratory distress or pleural effusion signs
Bleeding Signs	Absent	Tourniquet test negative; no petechiae

Laboratory investigations were initiated to ascertain the etiology of the febrile illness. The haematological profile was monitored serially over a seven-day period to track disease progression. The initial complete blood count (CBC) on Day 1 showed a platelet count of 1.2 lakh/μL. By Day 3, this had declined to a nadir of 85,000/μL, consistent with the critical phase of dengue infection. Subsequent monitoring showed a stabilization at 90,000/μL on Day 4, followed by a robust recovery to 1.5 lakh/μL on Day 6 and 2.5 lakh/μL by Day 7.

Table 2. Serial Platelet Monitoring and Disease Progression

Day of Illness	Platelet Count (/μL)	Phase of Dengue	Clinical Status
Day 1	120,000	Febrile Phase	High fever, myalgia
Day 3	85,000	Critical Phase (Nadir)	Defervescence, risk of leakage
Day 4	90,000	Critical Phase	Stabilizing, close monitoring
Day 6	150,000	Recovery Phase	Improved appetite, afebrile
Day 7	250,000	Recovery Phase	Full recovery, discharge

Specific serological testing for dengue confirmed the diagnosis, with the Non-Structural Protein 1 (NS1) antigen testing reactive, indicating acute infection. Tests for IgM and IgG antibodies were non-reactive, suggesting a primary infection rather than a secondary one. To rule out competing diagnoses, a Widal test was performed, yielding titers of 1:40 for *Salmonella typhi* O and H antigens, and 1:20 for *S. paratyphi* AH/BH, which were clinically insignificant and excluded enteric fever. Additionally, peripheral blood smear examination for malarial parasites (*Plasmodium falciparum* and *Plasmodium vivax*) was negative. C-Reactive Protein (CRP)

was elevated at 23.1 mg/L, reflecting an acute inflammatory state, while liver and renal function tests remained within normal physiological limits.

2.3. Therapeutic Intervention and Clinical Outcome

The management plan was formulated in adherence to standard paediatric guidelines, focusing on symptomatic relief and fluid resuscitation. Antipyretic therapy with acetaminophen was administered to manage hyperpyrexia, while non-steroidal anti-inflammatory drugs (NSAIDs) were strictly avoided to prevent exacerbating any potential coagulopathy or gastritis.

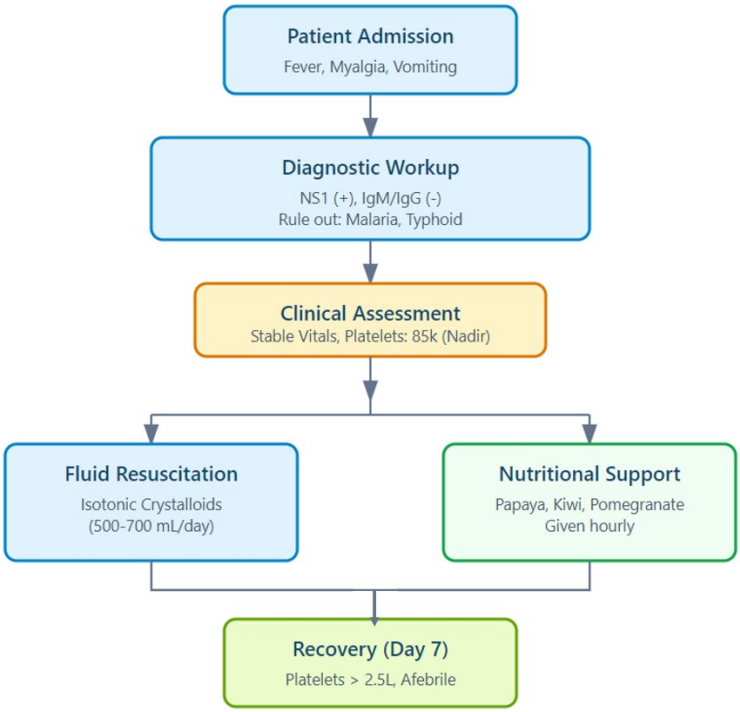

Figure 1. Clinical Management for Paediatric Dengue

The primary therapeutic intervention involved continuous intravenous fluid therapy maintained for five days. The fluid regimen was calculated to cover maintenance requirements and correct any subclinical dehydration, utilizing isotonic crystalloids at a rate of 500–700 mL/day. This was titrated based on clinical signs of hydration and urine output to prevent fluid overload.

Concurrently, a specialized nutritional protocol was implemented to support immunological function and thrombopoiesis. The patient was placed on a structured diet administered at hourly intervals. This regimen included foods rich in vitamins, minerals, and antioxidants, specifically broccoli, kiwi, dragon fruit, papaya, and pomegranate. Fluid intake was further supplemented with vegetable soups, specifically spinach (*Palak*) soup, and fresh orange juice to ensure high Vitamin C intake. The rationale behind this dietary approach was to reduce oxidative stress and provide essential micronutrients required for bone marrow recovery.

Table 3. Nutritional Support Regimen

Dietary Category	Specific Items	Targeted Nutritional Benefit	Frequency
Platelet Support	Papaya (Fruit/Leaf extract), Pomegranate	*Carica papaya* enzymes (ALOX12 expression), Antioxidants	Hourly intervals
Vitamin C Sources	Kiwi, Dragon Fruit, Orange Juice	Endothelial integrity support, Immune boosting	With meals/snacks
Micronutrients	Broccoli, Spinach Soup	Iron, Folate, Vitamin K for coagulation support	Main meals
Hydration	Vegetable Soups, Oral Rehydration	Maintain intravascular volume, Electrolyte balance	Continuous

The patient's clinical course was uncomplicated. Following the initiation of fluid therapy and nutritional support, the platelet count showed a steady upward trend after the third day. The patient remained haemodynamically stable throughout the admission, with no development of warning signs such as abdominal pain, mucosal bleeding, or lethargy. Complete clinical recovery was achieved by Day 7, coinciding with the normalization of platelet counts, and the patient was discharged with advice on vector control measures.

3. Discussion

3.1. Pathophysiology of Thrombocytopenia in Dengue

The haematological dysregulation observed in this case is a characteristic feature of dengue infection. Thrombocytopenia in dengue is driven by complex pathological mechanisms. Firstly, the dengue virus induces bone marrow hypoplasia by directly infecting progenitor cells and stromal cells, thereby inhibiting megakaryopoiesis [10]. Secondly, there is an immune-mediated component where cross-reactive antibodies bind to platelets, leading to their destruction by the reticuloendothelial system. Additionally, high levels of circulating NS1 antigen can activate endothelial cells, leading to platelet sequestration and consumption [11]. The observed decline in platelets to 85,000/μL in this patient corresponds to the critical phase of illness, typically occurring between days 3 and 6, during which the risk of plasma leakage is highest.

3.2. Principles of Fluid Management

The successful outcome in this case highlights the critical importance of fluid management. The World Health Organization guidelines prioritize the maintenance of intravascular volume to prevent shock, which is the primary cause of mortality in severe dengue [12]. In paediatric patients, who have a higher metabolic rate and surface area-to-mass ratio, dehydration can precipitate rapid clinical deterioration. The administration of intravenous fluids in this case was judicious, balancing the need for perfusion support against the risk of fluid overload, a known complication that can lead to respiratory distress [13]. The absence of bleeding manifestations despite moderate thrombocytopenia reinforces the consensus that prophylactic platelet transfusion is unnecessary in stable patients, even with counts <20,000/μL, provided there is no coagulopathy [14].

3.3. Role of Nutritional Therapeutics

A notable aspect of the management in this case was the integration of targeted nutritional support. While definitive large-scale randomized control trials are evolving, various studies suggest that specific dietary components may influence haematological recovery. *Carica papaya* leaf extracts have been shown to increase ALOX12 (arachidonate 12-lipoxygenase) gene expression, which is associated with increased platelet production [15]. Fruits like kiwi and pomegranate are rich in polyphenols and Vitamin C, potent antioxidants that may mitigate the oxidative stress associated with viral replication and inflammation. Vitamin C also plays a role in enhancing immune function and maintaining endothelial integrity [16]. The rapid recovery of platelet counts observed in this patient suggests that such nutritional interventions, when combined with standard medical care, may support the body's natural recovery processes and shorten the duration of thrombocytopenia.

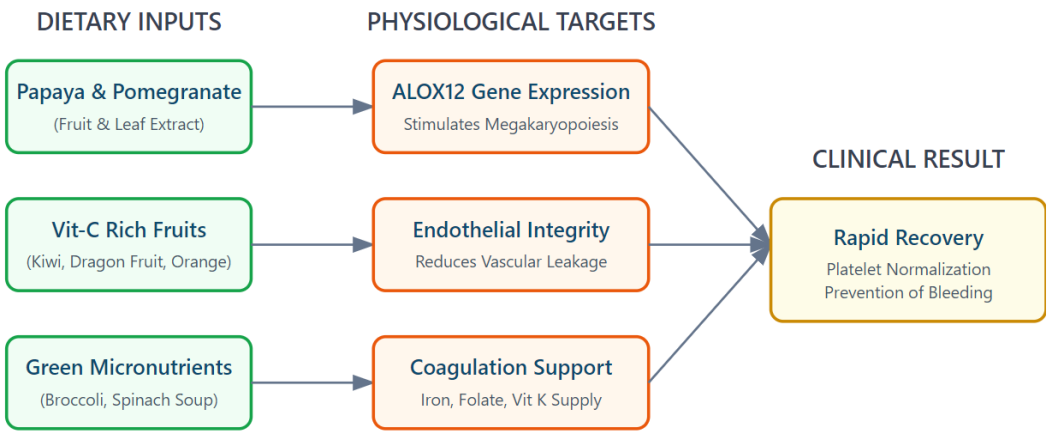

Figure 2. Nutritional Therapeutic Model

4. Conclusion

This case report elucidates the successful management of a paediatric patient presenting with dengue fever and moderate thrombocytopenia. It demonstrates that a conservative management strategy, anchored in vigilant clinical monitoring, appropriate fluid resuscitation, and supportive nutritional care, can yield favorable outcomes without recourse to blood product transfusions. The integration of immune-boosting and antioxidant-rich foods appears to offer adjunctive benefits in the recovery phase. Clinicians practicing in endemic regions should continue to prioritize early diagnosis and physiological support, reserving aggressive interventions for cases with demonstrated severe dengue or haemorrhage. Further research into the specific biochemical mechanisms of nutritional therapeutics in dengue could validate these observations and refine supportive care protocols.

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Author's Short Biography

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Dr. Syed Afzal Uddin Biyabani is a researcher specializing in diabetes and biostatistics, with specific expertise in data interpretation, outcome analysis, and clinical case methodologies. He has authored 11 academic books and published 13 research papers in recognized national and international journals. His work combines statistical modelling with evidence-based therapeutic evaluation to improve the quality of diabetes care and clinical research.

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