



CASE REPORT

EFFECT OF PAPAYA LEAF JUICE ON PLATELET AND WBC COUNT IN DENGUE FEVER: A CASE REPORT

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Summary:

Dengue fever caused by dengue viruses (dengue 1–4) having *Aedes aegypti* mosquito as their principal vector, causes symptoms such as sudden onset of fever, headache, retro-orbital pain and back pain along with severe myalgia due to which dengue fever is also known as “break-bone fever.” Laboratory findings include leukopenia, thrombocytopenia and in many cases, serum aminotransferase elevations. dengue hemorrhagic fever (DHF) or dengue shock syndrome (DSS) may occur as a complication of dengue fever. A pilot study and a randomized controlled trial showed that administration of papaya leaf juice was beneficial in dengue patients in elevating the total white cell counts and platelet counts. Based on this report, a dengue patient with thrombocytopenia and leukopenia was treated in a tertiary Ayurveda hospital. The patient was administered papaya leaf juice in the dose of 25 ml twice daily along with conventional line of management for a period of eight days. There was remarkable improvement in the subjective symptoms and the white blood cell count and platelet count were restored to normalcy.

Keywords: Ayurveda, dengue fever, papaya leaf juice, platelet count, dengue hemorrhagic fever

Introduction:

Dengue fever is caused by dengue viruses (dengue 1–4) having *Aedes aegypti* mosquito as their principal vector. After an incubation period of 2–7 days, the patient typically experiences the sudden onset of fever, headache, retro-orbital pain and back pain along with the severe myalgia due to which dengue fever is also known as “break-bone fever.” The illness may last a week, usually with additional symptoms like anorexia, nausea or vomiting. Laboratory findings include leukopenia, thrombo-cytopenia and in many cases, serum aminotransferase elevations. The diagnosis is made by IgM ELISA; antigen-detection ELISA or RT-PCR during the acute phase; paired serology during recovery. Dengue hemorrhagic fever (DHF) or Dengue shock syndrome (DSS) may occur as a complication of dengue fever. DHF is identified by the detection of bleeding tendencies

(tourniquet test, petechiae) or overt bleeding in the absence of underlying causes such as pre-existing gastrointestinal lesions. DSS, usually accompanied by hemorrhagic signs, may result from increased vascular permeability leading to shock and is much more serious. In mild DHF/DSS, restlessness, lethargy, thrombocytopenia and hemo-concentration are detected 2–5 days after the onset of typical dengue fever, usually at the time of defervescence. The maculopapular rash that often develops in dengue fever may also appear in DHF/DSS. In more severe cases, frank shock characterized by low pulse pressure, cyanosis, hepatomegaly, pleural effusions, ascites and in some cases, severe ecchymoses and gastrointestinal bleeding is apparent.¹

Today, the world is looking up to complimentary systems of medicine such as Ayurveda for treatment of disorders such as

dengue for which specific treatment is not available.² In this regard, when the literature was surveyed, a pilot study showed that the administration of papaya leaf juice proved to be beneficial in dengue patients in elevating the total white cell counts, platelet counts and recovery without hospital admission.³ A randomized controlled trial demonstrated that the administration of papaya leaf juice in dengue fever and DHF is safe and induces rapid increase in platelet count.¹⁰ One case, where the administration of papaya leaf juice to a patient of dengue fever in a tertiary Ayurveda hospital was found to be beneficial, is reported here.

Case history:

A 51 years old male patient reported to the Kayachikitsa outpatient department on 11th June 2013, with history of fever associated with chills and generalized body ache. On asking about the details of the same, he stated that he was alright till the evening of 4th June 2013 after which he developed loss of appetite and nausea. The next day he begot fever with chills, generalized body ache and weakness. He took treatment from a nearby doctor but found little relief. After 3 days he suffered from loose stools and an old pile mass began to bleed during defecation. He had bitter taste sensation in the mouth. He had past medical history of jaundice at the age of 15 and no surgical history.

On examination, he was afebrile, had pulse rate of 60/min with good volume and blood pressure of 110/80 mm of Hg. Per abdomen examination revealed tenderness in epigastrium. He was subjected to various routine laboratory investigations. He tested positive for dengue NS1/IgG-IgM test. Routine blood examination revealed leukopenia (white blood cell count-3,600 cells/cmm) and thrombocytopenia (platelet count-56,000 cells/cmm). USG scan of abdomen showed acalculous cholecystitis. The same day he was admitted in the inpatient department and the opinion of an allopathic physician was sought.

Treatment and results:

From the second day of admission,the patient was advised IV fluids (ringers lactate) in maintenance dose; Injection dexamethasone-1

ampoule IV twice daily; Injection gramocef-1g IV twice daily; tablet paracetamol 650mg-one tablet thrice daily.

The next day, in addition to the above, papaya leaf juice in the dose of 25ml was advised to be taken twice daily. The papaya leaf juice was prepared from washed tender leaves after deveining them and then grinding in a juice extractor with small quantity of water. This regimen was followed upto seventh day of admission.

On the eighth day, treatment was revised and the patient was advised to take papaya leaf juice in the same dosage; syrup balaguduchyadi kashaya 15 ml thrice daily after food with 15 ml water; tablet samshamani vati-2 tablets thrice daily after food; tablet septilin-1 tablet thrice daily after food. By 19th June, the patient recovered well and was discharged with the same advice. Day wise improvement in subjective and haematological findings is presented in Table 1.

Table 1: Effect on clinical & laboratory parameters

<i>Date</i>	<i>Complaints and clinical findings</i>	<i>Platelet count</i>	<i>WBC count</i>
11/06/2013	myalgia, nausea, weakness, bitter taste, bleeding pile mass, afebrile	56,000 cells/c mm	3,600 cells/ cmm
12/06/2013	-do-	52,000 cells/cmm	4,600 cells/cmm
13/06/2013	-do-	60,000 cells/cmm	8,600 cells/cmm
14/06/2013	nausea and bitter taste in mouth reduced; weakness, myalgia, bleeding pile still persist; afebrile	71,000 cells/cmm	10,200 cells/ cmm
15/06/2013	-do-	1.11 lakh cells/cmm	10,800 cells/cmm
16/06/2013	no nausea and bitter taste. Weakness and myalgia reduced. bleeding from pile mass stopped. patient was afebrile	-	-

17/06/2013	Patient was asymptomatic	1.99 lakh cells/cmm	10,600 cells/cmm
18/06/2013	-do-	1.98 lakh cells/cmm	10,200 cells/cmm
19/06/2013	-do-	2.29 lakh cells/cmm	10,900 cells/cmm

(Sample were collected between 8-9am daily)

Discussion:

Dengue virus induces bone marrow suppression resulting in low platelet count. Anaemia and spontaneous severe bleeding are the other consequences of bone marrow suppression. Dengue virus can bind to human platelets in presence of virus specific antibody and cause immune mediated clearance of platelets.⁵ A study suggested that hemorrhage in dengue without circulatory collapse is most likely due to activation of platelets rather than coagulopathy, which is well compensated. Vascular alteration may be the principal factor involved in the association of thrombocytopenia and hemorrhage with disease severity.⁶

The journey to drug discovery through the study of immune-modulatory effects against dengue infection lies on the research of generic compounds and natural products.⁴ Vinca alkaloids have been proven effective against anti-platelet macrophages in patients suffering from Idiopathic Thrombocytopenic Purpura (ITP).⁷ The saponins in *Panaxnoto ginseng* have been shown to reduce platelet adhesion and aggregation, prevent thrombosis and improve microcirculation.⁵ *Carica papaya* leaves contain various phytoconstituents like saponins, tannins, cardiac glycosides and alkaloids. The alkaloids present include carpaine, pseudocarpaine and dehydrocarpaine I and II. These constituents can act on the bone marrow, prevent its destruction and enhance its ability to produce platelets. Moreover, it can also prevent platelet destruction in the blood and thereby increase the life of the platelet in circulation.⁸ *Carica papaya* was found to have protective effect on the bone marrow and stimulate haemopoiesis of the cells, particularly the myeloblasts and megakaryocytes.⁹

In the present case, it was observed that upon administration of papaya leaf juice, both the platelet and total white cell count were restored to normalcy as suggested by the above studies and the patient was relieved of all subjective symptoms.

Conclusion:

The administration of papaya leaf juice was found to be beneficial in increasing the platelet and white blood cell count in the case of dengue reported. This fact is well established by various experimental studies and clinical trials cited earlier. Hence it can be concluded that papaya leaf juice would definitely prove beneficial to the mankind at large owing to the cost effectiveness and easy availability of papaya plant.

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