

CHAPTER - 9

ROLE OF PAPAYA LEAF JUICE IN DENGUE FEVER - A CASE STUDY

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Abstract

Dengue fever caused by dengue viruses 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 leucopenia, thrombocytopenia and in many cases, serum aminotransferase elevation. A pilot study and 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 suspected dengue patient with thrombocytopenia and leucopenia was treated in a Siddha, Ayurveda Hospital. The patients were administered papaya leaf juice in the dose of 15 ml thrice daily along with conventional line of management for a period of seven days. There was remarkable improvement in the subjective symptoms and white blood cell and platelet count were restored to normalcy.

Key words: Dengue fever, papaya leaf juice, platelet count

Introduction:

Dengue fever is caused by dengue viruses 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. Dengue hemorrhagic fever may occur as a complication of dengue fever. Dengue hemorrhagic fever is identified by the detection of bleeding tendencies or over bleeding in the absence of underlying causes such as pre-existing gastrointestinal lesions. Dengue shock syndrome, usually accompanied by hemorrhagic signs, may result from increased vascular permeability leading to shock and is much more serious. In mild Dengue hemorrhagic fever, restlessness, lethargy, thrombocytopenia and hemoglobin concentration are detected 2-5 days after the onset of typical dengue fever. The maculopapular rash that often develops in dengue fever may also appear in Dengue hemorrhagic fever. In more severe cases, frank shock characterized by low pulse pressure, cyanosis, hepatomegaly, pleural effusions, ascities and some cases, severe echymosis and gastrointestinal bleeding is apparent (Peters, 2008).

Today the world is looking up to complimentary systems of medicine such as Siddha Medicine for treatment of disorders such as dengue for which specific treatment is not available (Wikipedia, 2018). 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 (Hettige, S, 2008). A randomized controlled trial demonstrated that the administration of papaya leaf juice in dengue fever and Dengue hemorrhagic fever is safe and induces rapid increase in platelet count (Subenthiran *et al* 2013).

Case history:-

Five male & female patients reported to the and platelet count on 11th November 2018, with history of fever associated with chills and generalized body ache and weakness. They took treatment from a nearby doctor but found little relief. After 3 days they suffered from loose stools and an old pile mass began to bleed during defecation. They had bitter taste sensation in the mouth.

On examination they were febrile, pulse rate of 60 / min with good volume and mean blood pressure of 110 / 80 mm Hg. Per abdomen examination revealed tenderness in epigastrium. They were subjected to various routine laboratory investigations. Routine blood examination revealed leucopenia (white blood cell count 3,600 cells/cmm) and thrombocytopenia (platelet count - 56,000 cells/cmm).

Treatment and results:

Papaya leaf Juice in the dose of 15 ml was advised to be taken thrice 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 up to seventh day of admission. Syrup of Nilavembu Kashayam 15 ml thrice daily after food with 15 ml of water. Tablet sutharsana - 2capsules thrice daily after food.

Table - 1 Effect on laboratory parameters

Patients	1 st day platelet count	3 rd day platelet count	7 th day platelet count	1 st day WBC count	3 rd day WBC count	7 th day WBC count
1	58,000cells/cmm	108,000cells/cmm	212,000cells/cmm	3600cells/cmm	4100cells/cmm	48000cells/cmm
2	78,000cells/cmm	158,000cells/cmm	218,000cells/cmm	3700cells/cmm	4300cells/cmm	4600cells/cmm
3	88,000cells/cmm	176,000cells/cmm	318,000cells/cmm	3600cells/cmm	4600cells/cmm	4200cells/cmm
4	118,000cells/cmm	188,000cells/cmm	28,000cells/cmm	3400cells/cmm	3800cells/cmm	4100cells/cmm
5	122,000cells/cmm	188,000cells/cmm	218,000cells/cmm	3800cells/cmm	4400cells/cmm	4200cells/cmm

Discussion:

Dengue virus includes 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 (Wang *et.al.* 2004). A study suggested that hemorrhage in dengue without circulatory collapse is most likely due activation of platelets rather than coagulopathy, which is well compensated. Vascular alteration may be the principle factor involved in the association of thrombocytopenia and hemorrhage both disease severities (Krishnamurti *et. al.* 2001).

The journey to drug discovery through the study of immuno- modulatory effects against dengue infection lies on the research of generic compounds and natural products (Selisko *et.al.* 2006). Vinca alkaloids have been proven effective against anti-platelet macrophages in patients suffering Idiopathic Thrombocytopenic purpura (Ahn *et.al.*1998). The saponin in *Panaxnoto ginseng* have shown to reduce

platelet adhesion and aggregation, prevent thrombosis and improve microcirculation (Wang *et.al.* 2004). *Carica papaya* leaves contain various phyto-constituents like saponin, tannins, cardiac glycoside and alkaloids. The alkaloids present include carpaine, pseudocarpaine and dehydrocarpaine. 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 (Patil *et.al* 2013). *Carica papaya* was found to have protective effect on the bone marrow and stimulate haemopoiesis of the cells, particularly the myeloblast and megakaryocytes (Tham *et.al.* 2013). In the present cases, 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 patients were 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 suggested dengue reported. 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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