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Case Report

Effect of Carica Papaya leaf extract on febrile thrombocytopenia in patients with Dengue

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Abstract

Dengue is a rapidly increasing public health problem in tropical and subtropical regions with a large percentage of the world's population at risk. Febrile thrombocytopenia is common condition seen in dengue patients, which increase the mortality rate. Ayurveda classical texts mentioned use of Carica papaya (C. papaya) in treating fever, pain and other related symptoms. Six subjects were randomly allotted in control and study group. The control group subjects were treated with only medical management and study group were treated with C. papaya leaf extract in addition to medical management. In this case series, we observed that compared to the control group, those in the study group recovered earlier clinically with a faster rise in platelet count. Further larger sample size, randomized control trails with complete blood counts are necessary to evaluate the efficacy of C. Papaya in dengue patients.

Key words: Carica Papaya, Dengue fever, Thrombocytopenia

Introduction

Dengue viral infection produces a spectrum of clinical illness, ranging from an asymptomatic or mild febrile illness, classic dengue fever to the most severe form of illness; dengue haemorrhagic fever (DHF), which results from severe thrombocytopenia [(1)]. Currently, there is no specific medication to treat dengue. Only symptomatic management is recommended [(2, 3)]. Ayurveda classical texts mentioned use of Carica papaya (C. papaya) in treating fever, pain and other related symptoms [(4)].

Case History

Six subjects were brought to the casualty of R.L Jalappa hospital and research centre with symptoms of fever, myalgia and severe arthralgia. R.L Jalappa hospital is a multi-specialty teaching hospital with 1050 beds in Kolar district of Karnataka state in India. All subjects were in the age group between 18 – 60 years. On investigation, they were found to be dengue IgM antibodies positive and had platelet counts between 51,000- 76000 Cells/m^3. No subjects had bleeding manifestations or mixed infections (tested positive for malaria, leptospirosis along with dengue) or a recent (<120 days) transfusion of platelets & whole blood. After taking informed consent, they were randomly divided into two groups (control and study) of three subjects each. Three subjects of the control group were treated with only medical management. Three subjects in the study group were administered 5ml of C. Papaya leaf extract in addition to medical management. C. Papaya leaf extract was administered before food, twice a day for 3 consecutive days with sugar for better palatability.

Preparation of C. Papaya leaf extract: Every day early in the morning fresh C. Papaya leaves

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(Figure 1) were collected, thoroughly washed by water and wiped with sterile linen cloth. The leaves were grinded in sterile fruit juice extractor without adding water. The paste of the C. Papaya leaves was kept inside the sterile linen cloth, after squeezing, filtrate (extract) was collected through sterile filter and stored in a sterile container. All aseptic measures were taken care while preparing the extract.

Fig:1 – Fresh Papaya Leaf

During the course of C. Papaya leaf extract administration, platelet counts were investigated every day in all the subjects. Platelet counts of control group and study group were tabulated in Table1 and Table2 respectively. Compared to the control group, those in the study group recovered faster clinically with a faster rise (statistically it shows 2:1 ratio) in platelet count.

Control Group Dengue Patients	Initial Platelet Count	Platelet Count Day 1	Platelet Count Day 2	Platelet Count Day 3
Subject 1	$54\times10^3/\mu L$	$40\times10^3/\mu L$	$76\times10^3/\mu L$	$90\times10^3/\mu L$
Subject 2	$68\times10^3/\mu L$	$94\times10^3/\mu L$	$110\times10^3/\mu L$	$155\times10^3/\mu L$
Subject 3	$76\times10^3/\mu L$	$88\times10^3/\mu L$	$98\times10^3/\mu L$	$120\times10^3/\mu L$
Mean	$66\times10^3/\mu L$	$77.3\times10^3/\mu L$	$94.7\times10^3/\mu L$	$121.7\times10^3/\mu L$

Table:1 – Shows platelet counts of control group (medical management only)

Study Group Dengue patients	Initial Platelet Count	Platelet Count Day 1	Platelet Count Day 2	Platelet Count Day 3
Subject 1	$52\times10^3/\mu L$	$80\times10^3/\mu L$	$120\times10^3/\mu L$	$190\times10^3/\mu L$
Subject 2	$74\times10^3/\mu L$	$98\times10^3/\mu L$	$156\times10^3/\mu L$	$212\times10^3/\mu L$
Subject 3	$56\times10^3/\mu L$	$78\times10^3/\mu L$	$110\times10^3/\mu L$	$166\times10^3/\mu L$
Mean	$60.7\times10^3/\mu L$	$85.3\times10^3/\mu L$	$128\times10^3/\mu L$	$189.3\times10^3/\mu L$

Table:2 – Shows platelet counts of study group (C. papaya leaf extract medical management only)

Discussion

Febrile thrombocytopenia is one of the associated conditions seen in dengue, which may lead to dengue haemorrhagic fever, in turn leading to shock and can be fatal. In this case series of dengue patients with febrile thrombocytopenia are treated with only medical management in control group and C. papaya leaf extract in addition to medical management for study group. We observed that study group was shown better recovery interns of clinical symptoms and increase of platelet counts. The exact mechanism of how C. Papaya leaf extract helps in dengue fever symptoms and the platelet counts increase, yet to be explored.

C. papaya belongs to the plant family Caricaceae. C. papaya contains two important biologically compounds viz: chymopapain and papain which are widely used for digestive disorders [5]. There are several studies showing efficacy of different parts of C. papaya used to treat , malaria, cancer and tumour [6, 7]. In an animal experiment C. papaya leaf extract found beneficial in thrombocytopenia [8]. Nisar Ahmed et al, reported single case with initial platelet count of $73\times10^3/\mu L$ improved to $137\times10^3/\mu L$ after on three days administration of C. Papaya leaf extract twice daily without any medical management. The study also noticed positive effect on in WBC count [9]. Krishna KL et al showed that the latex, ripe fruit, unripe fruit, seeds, seed juice, root, leaves, flower and stem bark of C. papaya are used as antimicrobial, anthelminthic, antimalarial, anti-amoebic, anti-fungal, hepatoprotective, male and female anti fertility, immune-modulatory and against histiminergic[5]. Dr. Hettige has put up a hypotheses that the leaf extract increases the white blood cells and blood platelets and normalises the clotting profile which are the main aspects affected when infected with dengue. The extract helps repair the damage caused to liver cells by dengue fever. Dr Kathiresan, AIMST University, Malaysia hypotheses states that the leaves of papaya were high in complex vitamins that might help bone marrow to rapidly increase blood platelet production [9]. In our study, we observed that the extract from C. papaya leaves helped in early improvement of dengue patients both clinically and with respect to platelet counts.

This observational case series showed that the fresh extract from Carica papaya leaves may help in early improvement of dengue patients both clinically and with respect to platelet counts. Further randomized control trails are necessary to draw the efficacy of C. Papaya in Dengue.

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