

# Assessment of Platelet Levels in Serum Samples of Dengue Patients Before and After Providing Papaya with Other Fruits.

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## ABSTRACT

**Background:** Dengue can be detected by various screening and confirmatory diagnostic methods. Among which estimation of platelet count is one such screening test and a better parameter for early prediction of Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS). The aim of the present study is to assess the platelet count increase by natural foods among dengue patients especially papaya. **Methods:** 11 patients were admitted on 05-10-16. Fruits like papaya, guava, apples in a small pieces and spoonful of grinded papaya leaves were given on 5-10-16, 6-10-16, 7-10-16 after every 8 hours. Patients were also supported with symptomatic treatment of Dengue. Blood samples of these patients were collected in morning times and was sent to lab for estimation of platelets. **Results:** On admission platelet count of these patients were between 12000 to 84000 cells per mL of blood. Increase in Platelet count was observed among all selected dengue patients. **Conclusion:** Papaya leaf extract improves thrombocytopenia condition, which in turn decreases the incidence of Dengue hemorrhagic fever and Dengue shock syndrome. Still many more studies are needed to evaluate the efficacy of papaya.

**Keywords:** Dengue, Papaya, Platelet Count.

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## INTRODUCTION

Dengue virus comes under flaviviridae family of arboviruses, which spreads by aedes species mosquito. Dengue virus results in a mosquito borne epidemic disease [1], Dengue fever, mostly confined to tropical regions.[2,3] In India Dengue virus predominantly spreads by Aedes aegypti mosquito. Dengue is also known as break bone fever. Four serotypes of Dengue exist : Den 1, Den 2, Den 3 and Den 4.

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Gravity of Dengue illness recognized in 1950's, has started with the detection of complications like Dengue Hemorrhage Fever (DHF) and Dengue Shock Syndrome (DSS) mainly in children in endemic areas. Dengue is affected by nearly 25 billion people worldwide. According to WHO survey approximately 100 million infections occur

every year and 2,50,000 to 5,00,000 cases of Dengue Hemorrhagic fever with fatality rate of 5% [4,5].

Dengue fever presents with various symptoms of fever, body and joint pains, rash, headache and also results in dreaded complications like Dengue hemorrhagic fever, Dengue shock syndrome. To decrease incidence of dengue and also to avoid the complications of it, there is a much need of quick and effective diagnostic methods to treat accordingly.

Dengue can be detected by various screening and confirmatory diagnostic methods. Among which estimation of platelet count is one such screening test and a better parameter for early prediction of Dengue hemorrhagic fever (DHF) and Dengue shock syndrome (DSS) [6]. Platelet count can also estimated quickly by microscopy during field visits in remote areas [7]. Dengue affects bone marrow and liver, in turn results in decrease in platelet count. Low platelet count results in sudden bleeding. Platelet count should be increased to alleviate complications of Dengue. This drop in platelet count can be increased by many natural foods like papaya, vegetable juices, pomegranate, milk, orange, pumpkins, berries, green leafy vegetables, cabbage, tomato, cauliflower, broccoli, fish, walnut [8,9]. In this study we have tried to assess the platelet count

increase by natural foods among dengue patients especially papaya.

## MATERIALS AND METHODS

This is a prospective study done in October month of 2016 at Department of Biochemistry, Government Medical College, Ananthapuram. Patients who were diagnosed with Dengue fever and admitted in General Medicine wards of Government General Hospital, Ananthapuram were selected to do this study.

11 Male patients without any complications or warning signs of dengue within the age group of 10 - 60 years were selected. Patients were diagnosed as Dengue by signs and symptoms, confirmed by NS1 ELISA and Rapid test for IgM and IgG.

Serum samples of all patients suspected of having dengue were processed for detection immediately. If there is any delay in testing, samples can be stored at 2-4°C. Antigen detection : Using NS1 ELISA of Pan Bio Company Antibody detection : Using Rapid Immunochromatographic test - IgM and IgG.

Patients were also underwent various investigations depending on symptoms like routine blood and urine test, Chikungunya rapid test, Chest ray, Dengue detection tests, WIDAL, Peripheral smear, Liver and Renal function tests.

For Platelet count analysis was done on all selected patients:

11 patients were admitted on 05-10-16. Fruits like papaya, guava, apples in a small pieces and spoonful of grinded papaya leaves were given on 5-10-16, 6-10-16, 7-10-16 after every 8 hours. Patients were also supported with symptomatic treatment of Dengue. Blood samples of these patients were collected in morning times and was sent to lab for estimation of platelets.

All blood samples platelet count was estimated by automated hematologic analyzer, which is quicker, good reliability and cost-effective.

## RESULTS

Patients diagnosed with dengue fever were selected to do this study. Among them 11 Male patients were selected randomly to assess platelet count. Platelet count was assessed before and after eating fruits.

11 patients were fed with fruits like papaya, apples, guava and spoonful of grinded papaya leaves on 5th, 6th, 7th October of 2016 after every 8 hours. On admission platelet count of these patients were between 12000 to 84000 cells per mcL of blood. Increase in Platelet count was observed among all selected dengue patients [Table 1].

Two children among selected population also shown increase in platelet count. platelet count assessment among 3 (27.2%) out of 11 patients, observed that decreased platelet count on 2nd day, then increase in platelet count on 3rd day.

**Table 1: Platelet count of patients who fed with fruits.**

S. No.	Age in years	Platelet count per mcL of blood assessed on		
		5-10-16	6-10-16	7-10-16
1	16	58000	150000	170000
2	30	40000	94000	140000
3	35	45000	94000	142000
4	40	48000	58000	140000
5	14	47000	200000	217000
6	55	62000	70000	140000
7	23	12000	8000	55000
8	22	130000	200000	210000
9	34	78000	99000	226000
10	32	32000	28000	92000
11	48	84000	72000	180000

## DISCUSSION

Dengue virus cause decrease in platelet count. Dengue virus enters into human body by mosquito bite, virus attach to white blood cells, enters into them. Virus starts replicating inside WBC's. After body's defense mechanism starts responding towards dengue virus through various mechanisms. White blood cells produce signaling proteins such as cytokines and interferons, which are responsible for symptoms of Dengue. In severe Dengue infection, liver and bone marrow gets affected.

Normal platelet count in humans is 150000 - 450000 per mcL of blood. Thrombocytopenia is a condition referred as when there is a decrease in platelet count (<100000 cells/mm<sup>3</sup>) [10]. Low platelet count results in bleeding, in severe thrombocytopenia causes uncontrolled bleeding can lead to life threatening conditions like shock and organ failure. Mainly two mechanisms were suggested among dengue, as impaired thrombopoiesis and peripheral plate destruction.

In this study, patients who were confirmed serologically as Dengue and with platelet count <84000 cells/mm<sup>3</sup> were included. There is an increase in platelet count among all the studied group. IN similar to our study, a study from Sri Lanka observed that there is an increase in platelet count among patients who received 2 papaya leaf extract at regular intervals of 8 hours [11]. A study from Pakistan also observed that increase in both platelet count and WBC count, on giving 25ml of papaya leaf extract twice a day for 5 days to patients [12].

Many studies are also reported that there is a definite improvement of Dengue associated thrombocytopenia [13,14].

A Randomized controlled trial was conducted in Malaysia among 290 dengue patients. Study has reported that intervention group who were administered with daily 50 g. of C. papaya leaves juice for 3 consecutive days, there is a increase in platelet count when compared to control group who were taken only standard treatment of Dengue [15].

Dengue fever is a self limited illness, needs supportive treatment to cure the disease and to

alleviate complications of dengue [10]. Fever can be treated by acetaminophen. Intravenous fluids, blood or platelet transfusions are necessary. NSAIDs should be avoided as these cause bleeding. No vaccine is available for prevention of dengue fever, still under clinical trials [16].

Since older times, papaya plant products has been used for various number of diseases. Many scientific studies suggested that extracts of papaya leaves, fruits and seeds gives many beneficial effects, also have bactericidal properties [17].

Various studies are going to know the effects of papaya on thrombocytopenia resulted due to dengue virus. C. papaya leaf extracts inhibited heat-induced and hypotonicity-induced hemolysis of erythrocytes these leaf extracts have membrane-stabilizing properties and also protect blood cells against stress-induced destruction [18].

## CONCLUSION

Papaya leaf extract along with standard dengue treatment helps patients to recover from dengue. Papaya leaf extract improves thrombocytopenia condition, which in turn decreases the incidence of Dengue hemorrhagic fever and Dengue shock syndrome. Still many more studies are needed to evaluate the efficacy of papaya.

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