An evaluation study onthe efficacy of Carica Papaya Leaf juice extract juice in the improvement of platelet count among selected Dengue patients.

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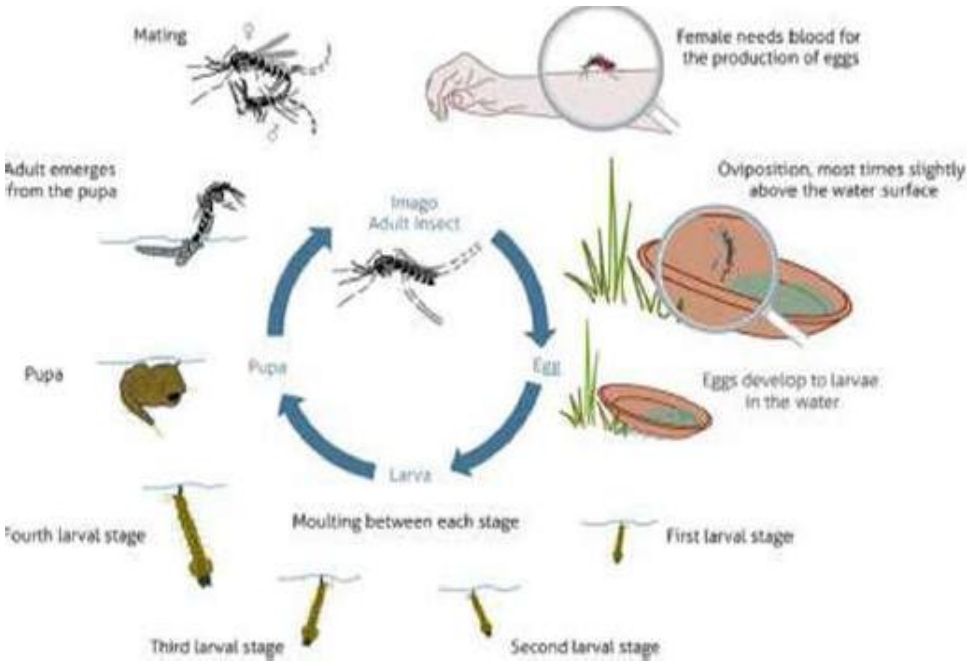
Abstract: Dengue is another infection caused by mosquitoes. It is a very common infection mainly in tropical and subtropical regions. In India, it is affected in all regions urban and rural. Dengue hemorrhagic fever is a very serious condition that has serious complications that leads to hospitalization and also death in some people especially in children. Second-time infection is dangerous but, one type of virus provides lifelong immunity. But the vaccine is available from 2015 for the age group between 9 to 45 who has previously dengue fever. According to the data by National Vector Borne Disease Control program, there is a drastic decrease in the death rate in India due to dengue fever. Carica papaya is a tropical plant, the leaves extract has medicinal and nutritional benefits and has a significant effect in Dengue fever patients in increasing platelet count. India has a strong culture of using herbs, and plant-based products in the treatment of various diseases. In the present study, thirty patients who are affected with dengue fever and platelets below 40,000 cmm, who are admitted to the different hospitals of Mumbai are selected. As per the doctor's advice, they have consumed 30ml of Carica papaya leaf extract, evaluation study is done to find the efficacy of Carica papaya leaf extract in increment of platelets. In all the patients it is observed there is a significant increase in the platelet count from baseline to day 6. It is evident that the leaf extract has the efficacy to increase platelet count and will aid in controlling complications and hospital stay.

Introduction: Dengue fever is a mosquito-borne viral infection that will affect all age groups. There are majorly four types of viruses (Soonwera M 2015), and the family to which it belongs is Flaviviridae. Two mosquitoes namely Aedes aegypti, and Aedes Albopictus are the transmitting agents. Usually, these mosquito bites will occur in the daytime and especially bite on the legs. usually, the incubation period will be 3 to 4 days. Dengue causesmosquitoesto breed in moist places especially water storage tanks, water in air coolers. The virus spreads from one person to another through mosquito-bitten. It is widely spread from one host to another human host. It causes infection through the lymph and other tissues. The infection may be mild to severe. According to the WHO the dengue fever is mainly classified into two. One is normal dengue fever which has fewer complications, and another is complicated or severe which can lead to a hemorrhagic condition.

Figure 1: Aedes Albopictus mosquito Life cycle



(Source:http://www.biogents.com/cms/website.php?id=/en/traps/mosquitoes/tiger_mosquitoes.htm)

DENGUE FEVER PREVALENCE IN INDIA:

In the years 50 and 60's dengue cases were reported in India. In the beginning, the infection was mild, and later on, the severity of the condition increased and the death rate also increased. In some states especially Maharashtra, Punjab, Gujarat, Rajasthan, Andhra Pradesh, Bengal, and in Delhi it has become in an endemic stage in the years 2010 to 2013. But there is a remarkable reduction in the mortalityrate (Cecilia D 2014).

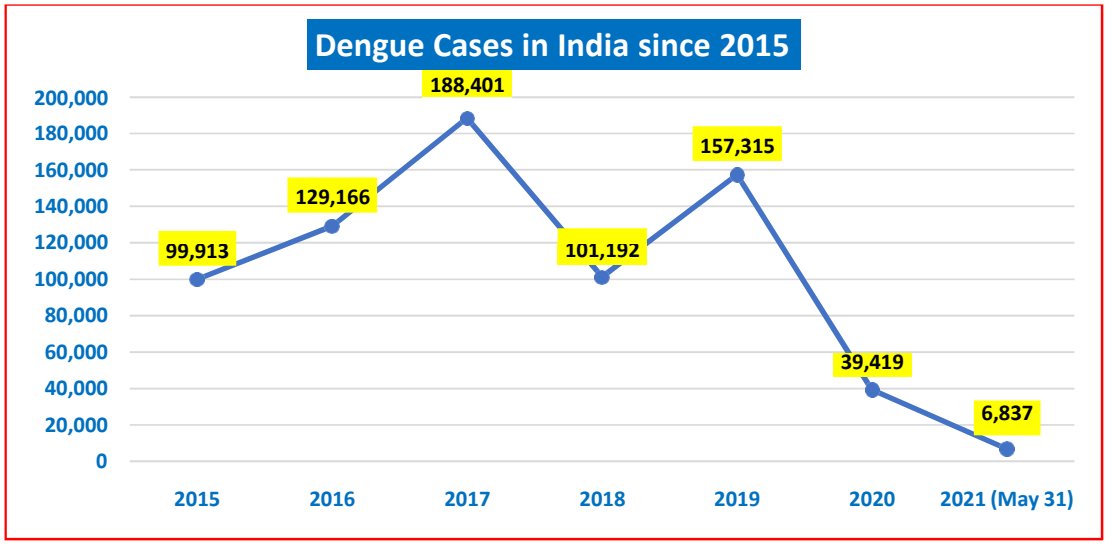


Figure 2: Dengue cases in India

Source: Times of India 2019.

Aetiology of Dengue Fever: Usually after a mosquito bite, it varies from person to person in the manifestation of symptoms. It may be from 3 to 14 days. Symptoms include fever, headache, chills, rash, body pains, back pain, diarrhoea, nausea. In severe cases, it may lead to haemorrge, drop in platelet

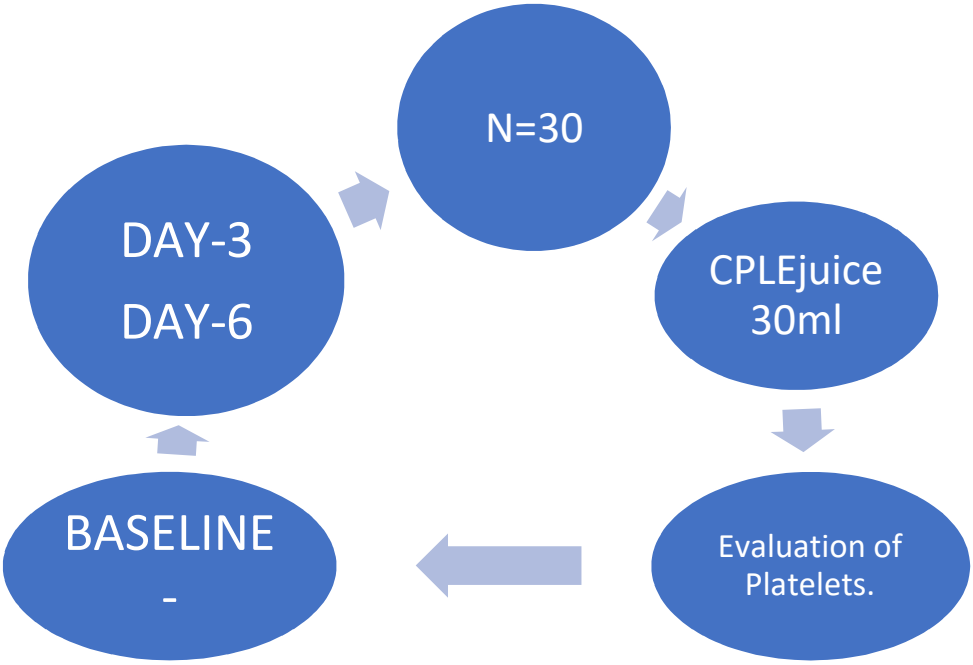
count, and WBC as well, platelet transfusion is needed in severe cases. During the initial stage if treated with good care complications can be reduced.
Otherwise, infection will damage the blood vessel and will lead to bleeding from the nose, and ears, and internal hemorrhage as well.(Dengue national guidelines 2015).

In ancient India, there is a practice to use plants, trees, and different herbs in the treatment of many diseases. Carica papaya leaf extract is also used as anti-viral, anti-fungal, and also in the treatment of tumors, and cancers. For the treatment of dengue, there is a very limited symptomatic treatment is available. And controlling thrombopytonea is a very big challenge. In many Asian countries, there is a tradition to use herbs in disease treatment. Carica papaya leaf extract has strong biological compounds which will help in the increase of platelet count in dengue patients. Herbs and natural products have come in align with standard treatment to control the complications and reduce the hospital stay of dengue patients.

METHODOLOGY:

30 dengue patients who are admitted to different hospitals in Mumbai were selected for the evaluation of the efficacy of Carica papaya leaf extract juice.

Figure :3 **RESEARCH DESIGN**



Inclusion Criteria:

Dengue fever patients whose antigen test is positive and platelet count less than 40,000 and not having any comorbidities, and not in ICU, and not undergoing platelet transfusion are selected for the study.

Carica Papaya Leaf Juice Extract: As per the doctor'sadvice patients are administered with Carica papaya leaf juice extract which is prepared at home.Mature papaya leaves 50 grams are collected, washed thoroughly, with piston and stone-ground it and added boiled and cooled water of 50 ml. The pulp is extracted and 30 ml juice is consumed with 10ml honey.

Data were analyzed statistically from baseline to day 1, day3, and day6. Co-relation and Significance test ($p<0.05$) are done.

RESULTS AND DISCUSSION:

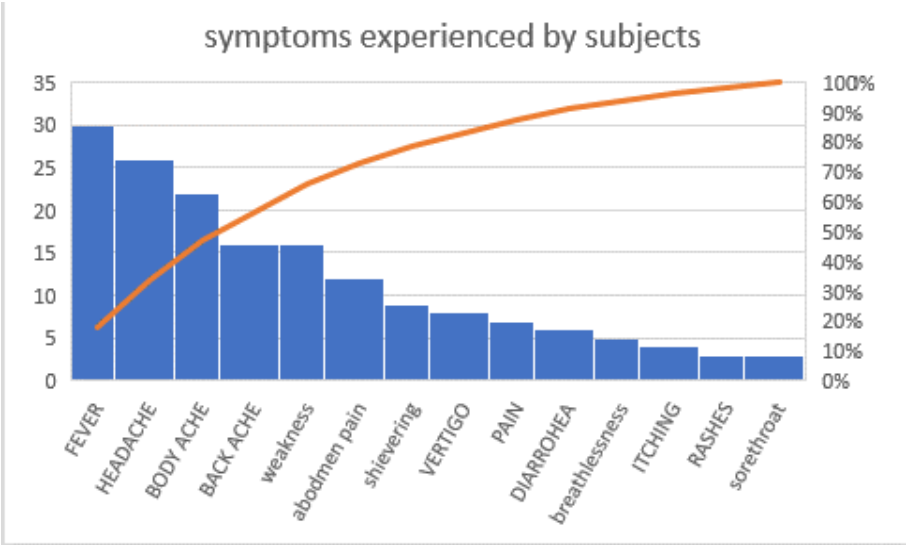
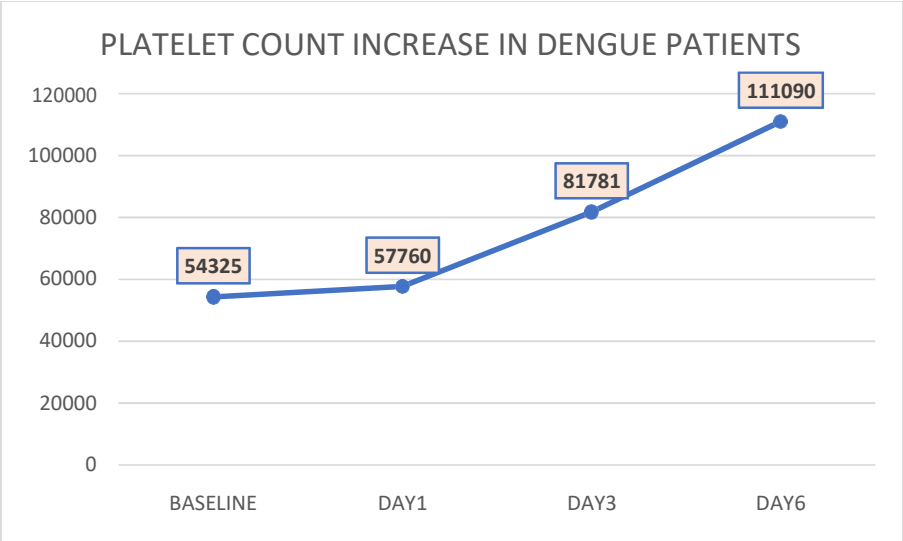


Figure:4 Symptoms experienced by subjects

30 patients who are admitted to different hospitals in Mumbai are selected for the evaluation study. 30 are admitted todifferent hospitals with platelet count less than 40,000µl are selected for the evaluation study. Patients have experienced different symptoms which include fever, headache, body ache, weakness, shiv ϵ ring, diarrhoea, sore throat, rashes.

Figure 5: Platelet count increase in dengue patients



Along with normal symptomatic regular treatment subjects have administered 30ml Carica papaya leaf juice extract 30 ml twice a day. To make it palatable juice is taken with honey.Platelet counts are noted on the baseline, day 1, day3, and day6 to find out the improvement in the platelet count. From the above graph, it is evident there is an improvement in the mean platelet count of the subjects.

The Mean platelet count of the baseline is 54,325 µl, day 1 the mean value is 57,760 µl, Day 3 the mean average platelet count is 81,781µl, and the day 6 value of mean average is 1,11090 µl. There is a standard increase in the platelet count.

Table: 1 Efficacy of papaya leaf juice extract on platelet count

Efficacy of papaya juice extract on platelet count					
		baseline	Day1	Day3	Day6
baseline	Pearson Correlation	1	.983**	.539**	.387*
	Sig. (2-tailed)		0.000	0.002	0.034
	Sum of Squares and	517338807	498772964	271164541	372301996

	Cross-products				
	Covariance	17839269	17199068	9350501	12838000
	N	30	30	30	30
Day1	Pearson Correlation	.983**	1	.502**	.383*
	Sig. (2-tailed)	0.000		0.005	0.037
	Sum of Squares and Cross-products	498772964	497377923	247832006	360721935
	Covariance	17199068	17150963	8545931	12438687
	N	30	30	30	30
Day3	Pearson Correlation	.539**	.502**	1	.549**
	Sig. (2-tailed)	0.002	0.005		0.002
	Sum of Squares and Cross-products	271164541	247832006	489189018	512754098
	Covariance	9350501	8545931	16868587	17681176
	N	30	30	30	30
Day6	Pearson Correlation	.387*	.383*	.549**	1
	Sig. (2-tailed)	0.034	0.037	0.002	
	Sum of Squares and Cross-products	372301996	360721935	512754098	1785944101
	Covariance	12838000	12438687	17681176	61584279
	N	30	30	30	30
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

The data clearly indicates that there is a significant improvement in the platelet count after taking Carica papaya leaf juice extract. No complications are noted after the administration.A P-value less than 0.002 indicates that the effect is very much significant. From baseline data to day 6 there is a vast increase in the platelet count.

Summary and conclusion:

Herbal remedies are not a new innovation in India and Asian countries. Carica papaya leaf juice has strong biological active compounds which have the potential strength to treat the thrombopenia condition, also reduce the hospital stay. Consumption of Carica papaya leaf juice extract is increased drastically from a few years it does not have any side effects, except a few may experience nausea. Many pharmaceutical companies are making tablets with Carica papaya leaf extract. Tea powder and readymade syrups for children are also available in the market. Though it does not have any potential side effects it is always advised it should be administered under the supervision of a doctor and it should be continued with normal standard treatment.

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