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Effectiveness of Carica papaya leaf extract on thrombocytopenia among dengue patients admitted in a tertiary care hospital, South India -A Pilot Study

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Abstract

Background: Recent literature and studies have shown the effectiveness of Carica papaya leaf extract in increasing the platelet count among patients with thrombocytopenia. The present study was conducted with the objective to study the Effectiveness of Carica papaya leaf extract on thrombocytopenia among dengue patients.

Materials and Methods: The present study was a randomized, comparative pilot study conducted at a Teritiary Care Hospital, South India. A total of 30 subjects (n=30) diagnosed as dengue cases by NS1 antigen test were enrolled and randomized in this study. The carica papaya leaf extract was formulated in suitable dosage form of tablet in the strength of 1100mg. All the participants were randomized into two groups by simple randomization by lottery method. Study group was given Carica Papaya Leaf Extract (CPLE) and routine supportive treatment for other group.

Results: Majority of the patients were in the age group of 26 – 35 years in both the groups. 60% were male in test group whereas it was 46.6% in the control group. There was a statistically significant difference observed in the platelet count between the study groups from day 2 to day 5 as the p value calculated to be statistically significant(<0.05). Trend line shows a 'J' shaped curve where 2nd day onwards a shallow rise was observed in the Carica group compared to control group which was statistically significant.

Conclusion: With the present study it can be concluded that Carica papaya leaf extract was found to be effective in increasing the platelet count significantly among dengue patients with thrombocytopenia.

Keywords: Carica papaya, Dengue, Thrombocytopenia

Introduction

The incidence of dengue has grown dramatically around the world in recent decades. A vast majority of cases are asymptomatic or mild and self-managed, and hence the actual numbers of dengue cases are under-

reported. Many cases are also misdiagnosed as other febrile illnesses.[1]

One modelling estimate indicates 390 million dengue virus infections per year (95% credible interval 284–528 million), of which 96 million (67–136 million) manifest clinically (with any severity of disease).[2] Another study on the prevalence of dengue estimates that 3.9 billion people are at risk of infection with dengue viruses. Despite a risk of infection existing in 129 countries[3], 70% of the actual burden is in Asia.[2]

The number of dengue cases reported to WHO increased over 15 fold over the last two decades, from 505,430 cases in 2000 to over 2,400,138 in 2010 and 3,312,040 in 2015. Deaths from 2000 to 2015 increased from 960 to more than 4032.[4]

Clinically, dengue causes moderately high-grade fever, rash with severe aches, mostly severe backache, and pain behind the eyes. Following this, there is an apparent phase of improvement and in severe forms symptoms such as vomiting, pain in the abdomen, red spots, reduction in urine output, change in alertness, and bleeding can occur. The red flag sign, citing the severity in serious dengue is a fluid leak from blood vessels and capillaries from the nose, gums, skin, lung vessels, intra-abdominal areas, etc.[5]

Four main characteristic manifestations of dengue illness are; continuous high fever lasting 2-7 days; haemorrhagic tendency as shown by a positive tourniquet test, petechiae or epistaxis; thrombocytopenia (platelet count < 100 x 109/L); and evidence of plasma leakage manifested by haemoconcentration (an increase in haematocrit 20% above average for age, sex and population), pleural effusion and ascites.[6]

The papaya fruit is globally consumed is said to be a rich source of vitamin A, C, and calcium. C. papaya leaves have been used in folk medicine for centuries. Recent studies have shown its beneficial effect as an anti-inflammatory agent,[7] for its wound healing properties, anti-tumour as well as immune-modulatory effects and as an antioxidant. A toxicity study (acute, subacute, and chronic toxicity) conducted on Sprague Dawley rats administered with Carica papaya leaves juice (CPLJ) of the sekaki variant revealed that it was safe for oral consumption.[8–10]

Literature cites the therapeutic effects of aqueous extract of papaya (Carica papaya) leaves that are presumed to be due to several active components (flavonoids, alkaloids, enzymes, and minerals) which may have antioxidant and immunomodulatory effects[10–12]. The present study was conducted to know the effectiveness of the Papaya leaf extract among dengue patients of a tertiary care hospital, South India.

Objectives

To study the Effectiveness of Carica papaya leaf extract on thrombocytopenia among dengue patients

Methodology

The present study was a randomized, comparative pilot study conducted at a Teritiary Care Hospital, South India. The carica papaya leaf extract was formulated in appropriate dosage form of tablet in the strength of 1100mg. A total of 30 subjects (n=30) diagnosed as dengue cases by NS1 antigen test were enrolled and randomized in this study.

Inclusion criteria

- Age between 18 and 60 years at the time of study were included
- Patient's diagnosis confirmed as DF or DHF Grade 1, Grade 2
- Patients platelet count is below 100,000 and above 30,000 per Ml
- ALT/SGPT level <165 U/L

- Those who were willing to participate were included.

Exclusion Criteria

- Patient diagnosed with DHF Grade 3 or 4
- Platelet levels are less than 30,000 per µL
- Patients with thrombocytopenia due to other causes Leukemia, Idiopathic thrombocytopenic purpura
- Other fevers with thrombocytopenia like malaria, brucellosis, enteric fever

All the participants were randomized into two groups by simple randomization by lottery method. Study group was given Carica Papaya Leaf Extract (CPLE) and routine supportive treatment for other group. Complete blood picture, platelet counts, haematocrit level, liver function test and renal function test for both groups were screened on daily basis. Follow up was done for the patients from the time of admission to discharge.

Statistical analysis

Data tabulation using Microsoft Excel 2013 and statistically analysis was done SPSS version 16. Descriptive statistics include Mean, standard deviation, frequencies, and percentages were calculated. Unpaired T test was used to compare the parametric data among the 2 groups. Chi-square test was used for non-parametric data. At 95% confidence interval, P value of <0.05 was statistically significant.

Results

Table 1: Age distribution

Age	Test group	Control group
18 - 25	3	3
26 - 35	8	6
36 - 45	2	4
46 – 55	2	2
Total	15	15
Mean	32.8 ± 8.96	34.46 ± 11.15
Chi-square = 0.95 , df: 3 , p>0.05 (Not Significant)		

A total of 30 Dengue patients who fulfil the inclusion and exclusion criteria were selected for the study. The mean age of the Carica papaya group was 32.8 ± 8.96 and 34.46 ± 11.15 in the control group. Majority of the patients were in the age group of 26 – 35 years in both the groups.

There was no statistically significant difference between the two groups as the p value calculated to be >0.05. (Table 1)

Table 2: Gender distribution

Gender	Test group	Control group
Male	9	7
Female	6	8
Total	15	15

In the present study, 60% were male in test group whereas it was 46.6% in the control group. There was no statistically significant difference between the two groups regard to gender as the p value calculated to be >0.05. (Table 2)

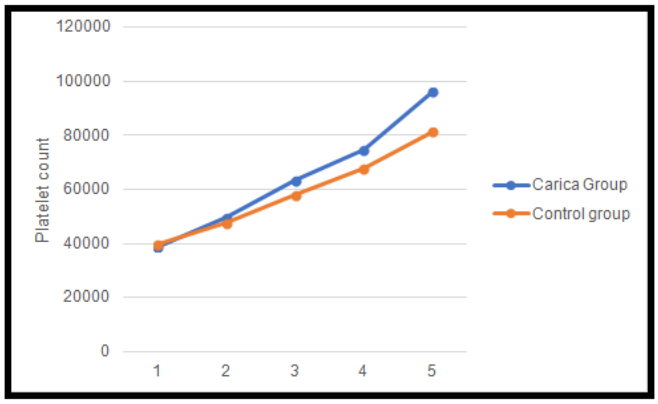
Table 3: Mean platelet count

Day of Hospitalisation	Mean Platelet count				
	Test group		Control group		P value
	Mean	SD	Mean	SD	
Day 1	38866.67	5289.702	39733.33	4382.867	>0.05
Day 2	49533.33	2559.762	47466.67	2799.66	<0.05*
Day 3	63266.67	4333.7	57800	4616.74	<0.05*
Day 4	74733.33	6963.852	67866.67	3777.124	<0.05*
Day 5	96133.33	7735.509	81400	6620.315	<0.05*

The mean platelet count on day 1 of the test group and control group was 38866.67±5289.70 and 39733.33±4382.86 respectively.

There was a statistically significant difference observed in the platelet count between the study groups from day 2 to day 5 as the p value calculated to be statistically significant(<0.05)(Table 3)

Figure 1: Mean platelet count



The trend line shows a 'J' shaped curve where 2nd day onwards a shallow rise was observed in the Carica group compared to control group. This rise was steeper on the 4th and 5th day. The gap observed implies a significant rise in the study group as compared to the control group.(Figure 1)

Discussion

In the present study, Majority of the patients were in the age group of 26 – 35 years in both the groups, these findings were comparable with the study conducted by Gowda et al[13] where majority of the cases among Test group and control group were of the age 26 – 45 years.

Based on gender, majority in the study were Male (53.3%) which was comparable to the study conducted by Vijeth B et al[6]

In present study it was observed that the subjects in the Test group that received CPLE (Caripill) have a steep increase in platelet count as compared to the placebo group. In a similar study conducted by Subenthiran et al[7] where Comparison of mean platelet count between intervention and control group showed that mean platelet count in intervention group was significantly higher than control group after 40 and 48 hours of admission (P < 0.01). Gowda et al[13] and Kasture et al[14] in their study concluded that Carica papaya leaf extract (CPLE) does significantly increase the platelet count in patients with thrombocytopenia associated with dengue with fewer side effects and good tolerability.

Charan et al in their systematic review concluded that C. papaya leafs extract has a definitive role in improving the platelet count in patients of dengue. With a wider Confidence Interval, the rise in platelet count may be very less and may not be clinically significant but there is a statistically significant positive effect on the rise of platelet count.[15]

Conclusion

With the present study it can be concluded that Carica papaya leaf extract was found to be effective in increasing the platelet count significantly among dengue patients with thrombocytopenia.

References

1. Waggoner JJ, Gresh L, Vargas MJ, Ballesteros G, Tellez Y, Soda KJ, et al. Viremia and Clinical Presentation in Nicaraguan Patients Infected With Zika Virus, Chikungunya Virus, and Dengue Virus. Clin Infect Dis. 2016 Dec 15;63(12):1584–90.

2. Bhatt S, Gething PW, Brady OJ, Messina JP, Farlow AW, Moyes CL, et al. The global distribution and burden of dengue. Nature. 2013 Apr 25;496(7446):504–7.

3. Brady OJ, Gething PW, Bhatt S, Messina JP, Brownstein JS, Hoen AG, et al. Refining the Global Spatial Limits of Dengue Virus Transmission by Evidence-Based Consensus. PLOS Neglected Tropical Diseases. 2012 Aug 7;6(8):e1760.

4. Dengue and severe dengue [Internet]. [cited 2020 May 25]. Available from: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue

5. Ho T-S, Wang S-M, Lin Y-S, Liu C-C. Clinical and laboratory predictive markers for acute dengue infection. J Biomed Sci. 2013 Oct 20;20:75.

6. B VS, Kauser MM, Mangasuli V, R VKS, Sree S, Varghese SA. Effect of Carica papaya leaf extract (CPLE) on thrombocytopenia among dengue patients of tertiary care hospital, Chitradurga, India. International Journal of Advances in Medicine. 2018 Jul 23;5(4):974–7.

7. Subenthiran S, Choon TC, Cheong KC, Thayan R, Teck MB, Muniandy PK, et al. Carica papaya Leaves Juice Significantly Accelerates the Rate of Increase in Platelet Count among Patients with Dengue Fever and Dengue Haemorrhagic Fever. Evid Based Complement Alternat Med [Internet]. 2013 [cited 2020 May 25];2013. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3638585/

8. Gurung S, Skalko-Basnet N. Wound healing properties of Carica papaya latex: in vivo evaluation in mice burn model. J Ethnopharmacol. 2009 Jan 21;121(2):338–41.

9. Otsuki N, Dang NH, Kumagai E, Kondo A, Iwata S, Morimoto C. Aqueous extract of Carica papaya leaves exhibits anti-tumor activity and immunomodulatory effects. J Ethnopharmacol. 2010 Feb 17;127(3):760–7.

10. Senthilvel P, Lavanya P, Kumar KM, Swetha R, Anitha P, Bag S, et al. Flavonoid from Carica papaya inhibits NS2B-NS3 protease and prevents Dengue 2 viral assembly. Bioinformation. 2013;9(18):889–95.

11. Sarala N, Paknikar S. Papaya extract to treat dengue: a novel therapeutic option? Ann Med Health Sci Res. 2014 May;4(3):320–4.

12. Singh SP, Kumar S, Mathan SV, Tomar MS, Singh RK, Verma PK, et al. Therapeutic application of Carica papaya leaf extract in the management of human diseases. Daru. 2020 May 5;

13. Gowda AC, Kumar NV, Kasture PN, Nagabhushan KH. A Pilot Study to Evaluate the Effectiveness of Carica Papaya Leaf Extract in Increasing the Platelet Count in Cases of Dengue with Thrombocytopenia. 2015 Mar [cited 2020 May 25]; Available from: https://imsear.searo.who.int/jspui/handle/123456789/159275

14. Kasture PN, Nagabhushan KH, Kumar A. A Multi-centric, Double-blind, Placebo-controlled, Randomized, Prospective Study to Evaluate the Efficacy and Safety of Carica papaya Leaf Extract, as Empirical Therapy for Thrombocytopenia associated with Dengue Fever. J Assoc Physicians India. 2016;64(6):15–20.

15. Charan J, Saxena D, Goyal JP, Yasobant S. Efficacy and safety of Carica papaya leaf extract in the dengue: A systematic review and meta-analysis. Int J Appl Basic Med Res. 2016;6(4):249–54.