Review Article

Carica Papaya Leaf Extracts to Accelerate Platelet Count in Dengue Fever

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ABSTRACT

Dengue is the most extensively emerging mosquito-borne viral disease, caused by an arbovirus through the bite of an infected *Aedesaegypti* mosquito found in tropical and sub-tropical regions around the world. Expansion of its endemics in more than 100 countries towards new territories in the hilly regions even in Nepal is a serious concern. The symptoms include mild to severe form characterized by high fever, rash, severe headache, severe joint & muscular pain, nausea, vomiting, and eye pain. It is usually a self-limited illness, and no specific antibiotic or antiviral treatment seems indicated only require to provide supportive care. The Carica Papaya Leaf Extracts (CPLE) has proposed to have beneficial in improving platelet counts and minimize symptoms as evidence by several studies.

Keywords: Carica Papaya, Dengue, Mosquito borne, Viral disease

INTRODUCTION

Dengue is crucial vector-borne viral human disease of 21st Century, across the tropical and subtropical region or every corner of world (Smith & Bronze, 2019). Approximately 100 billion dengue cases are reported worldwide and more than 390 million humans with chance of infection annually (Ganeshkumar et.al; 2018). WHO reported that more than 3.2 million cases in 2015, among them 2.35 million the American alone.

The incubation period ranges from 3 to 14 days and signs and symptoms appears with high fever, bradycardia, low blood pressure headache , cutaneous rashes, retro-orbital pain and other vague symptoms of hemorrhagic and shock syndrome. This requires urgent treatment (Ahmad, AsifAziz, Aftab, Ullah, Irfan Ahmad & Mustan, 2017). It has been mentioned that there is 3 phases of febrile, critical and recovery phases which should be managed carefully and prognosis has excellent results.

Role of Carica Papaya Leaf extract (CPLE) for Improving Fallen Platelet Count: Some Evidences

This viral disease is self-limiting in nature hence, mainstay of treatment &management has been focused on symptomatic and intensive supportive care. Besides, it has been seen that carica papaya leaf extract has been successfully used for the dengue infection with hemorrhagic manifestations in different parts of South Asia such as India, Pakistan, Indonesia, Sri Lanka and Malaysia. While reviewing the literature it was found that the most of the study conducted in modern allopathic government district and referral level hospitals in Asian countries.

Carica papaya is commonly called as paw-paw and it belongs to the family caricaceae, employed as a folk medicine, widely cultivated in tropical and subtropical countries; is a medicinal plant, and leaf extract has been used as an effective, safe, cheap folk or traditional remedy specially to combat Dengue (Dharmarathna et al., 2013). It has been seen that CPLE has given at any stage of the disease but for best results it should be given from the first day of fever until have fully recovered from the illness and advised not to stop the treatment halfway (BMJ Group, 2015). It has the effect of thrombocytopenia associated conditions and reported that it has membrane stabilizing properties and protect blood cells against stress induced destruction which could prevent platelet lysis due to the presence of flavonoids and other phenolic compounds in the papaya leaves (Ranasinghe, Ranasinghe, Abeysekera, Premakumara, Perera, Gurugama, et al; 2012).

The administration of this leaf extract seen as a form of juice, syrup, capsule or tablet to hasten recovery in different doses and linked with clinical improvement and shorter duration of hospital stay (Rajapakse et al; 2019).

A case control study in India revealed that CPLE has increase the expression of Arachidonate 12-lipoxygenase (ALOX 12) and platelet-activating factor receptor gene in study group as compared to the control group (Venugopal, Suresh & Halesha, 2018).Another multi-centric, double blind, placebo controlled, randomized, prospective study among 300 patients also have the significantly increase ($p< 0.01$) the platelet count with fewer side effects & good tolerability, (Kasture, Nagabhushan & Kumar, 2016).A longitudinal study in India among 200 patients also showed that CPLE significantly accelerates the increase in platelet count in study group ($p=0.002$) and reduces hospital stay (Vijeth, Kauser, Mangasuli, Kumar, Suba Sree & Varghes, 2018). It has been equally beneficial among the pediatric group as well with increased mean platelet counts (Srikanth, Reddy, Biradar, Shamanna, Mariguddi & Krishna Kumar, 2019)

In Malaysia, an open labeled randomized controlled trial among 229 patients ,with 30 ml of fresh juice (50 grams CP leafs) once daily, 15 minute after breakfast for 3 consecutive days showed significant increase in mean platelet count in intervention group ($P<0.001$) compared to control group (Subenthiran et al; 2013). In Pakistan a medical student , was given 150 ml of papaya leaf extract once daily for 5 consecutive days has increased platelet count (Siddique et al; 2014). The evidences from Indonesia and Sri Lanka have also the similar findings, but there was no any published research article found in Nepal.

CONCLUSION

Dengue fever is characterized by vague signs and symptoms of high grade fever, including risk of hemorrhage and shock. Thrombocytopenia is found as a major complication where carica papaya leaf extraction has shown an important role in acceleratione the platelet count and reduce the duration of hospital stay as evidence of several studies.

REFERENCES

Ahmad, S., Asif Aziz, M., Aftab, A., Ullah, Z., Irfan Ahmad M. and Mustan, A. (2017) Epidemiology of dengue in Pakistan, present prevalence and guidelines for future control. International Journal of Mosquito Research; 4(6): 25-32

BMJ Publishing Group (2015). Dengue Fever. BMJ; 15 September, 351:h4661. doi: https://doi.org/10.1136/bmj.h4661

Dharmarathna, SLCA.,Wickramasinghe, S., Rajapakse, PVJ., Waduge, RN. and Kularatne, SaM (2013). Does Carica papaya leaf-extract increase the platelet count? An experimental study in a murine model. Asian Pac J Trop Biomed. 3: 720-724.

Ganesh Kumar, P. et al. (2018). Dengue infection in India: A systematic review and meta-analysis. PLOS Negl Trop Dis. Jul; 12(7): e0006618. doi: 10.1371/journal. pntd.0006618

Kasture, PN,.Nagabhushan, KH. and Kumar, A. (2016). 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. JAssoc Physicians India. Jun; 64(6):15-20.

Rajapakse, S., de Silva, NL.,Weeratunga, P., Rodrigo, C., Sigera, C. and Fernando, SD. (2019).Carica papaya extract in dengue: a systematic review and meta-analysis. BMC Complement Altern Med. 2019 Oct 11;19(1):265. doi: 10.1186/s12906-019-2678-2.PMID: 31601215.

Ranasinghe, P., Ranasinghe, P., W P Kaushalya M Abeysekera,WP.,

SirimalPremakumara, G A., Perera, Y S., Gurugama, P. and Gunatilake, SB. (2012). In vitro erythrocyte membrane stabilization properties of Carica papaya L. leaf extracts *Pharmacognosy ResOct;*4(4):196- 202 DOI: 10.4103/0974-8490.102261

Siddique, O., Sundus, A. and Ibrahim, MF. (2014). Effects of papaya leaves on thrombocyte counts in dengue - a case report. J Pakistan Med Ass. 64 (3):364-6.

Smith, DS. & Bronze, MS. (2019). What is the global incidence of dengue? Updated: May 03, https://www.medscape.com/answers/ 215840- 43482/what-is-the-global-incidence-of-dengue

Srikanth, BK., Reddy, L., Biradar, S., Shamanna, M., Mariguddi, DD. and Krishnakumar, M. (2019). An open-label, randomized prospective study to evaluate the efficacy and safety of Carica papaya leaf extract for thrombocytopenia associated with dengue fever in pediatric subjects. Pediatric Health Med Ther. Jan 17;10:5-11. doi: 10.2147/PHMT.S176712.

Subedi ,D. and Taylor-Robinson, AW. (2016). Epidemiology of dengue in Nepal: History of incidence, current prevalence and strategies for future control. J Vector Borne Dis. Mar;53(1):1-7.

Subenthiran, S., Choon, TC., Cheong, KC., Thayan, R., Teck, MB. and Muniandy, PK. et al. (2013) Carica papaya leaves juice significantly accelerates the rate of increase in platelet count among patients with dengue fever and dengue haemorrhagic fever. Evidence Based Complement Alternat Med. 616-737.

Venugopal, K., Suresh, R M., Halesha, BR. (2018). Role of Carica papaya leaf extract tablets/capsules on platelet counts in cases of dengue thrombocytopenia. Int J Adv Med. Aug; 5(4):845-848 DOI: http://dx.doi.org/10.18203/2349-3933.ijam20182500

Vijeth, SB., Kauser, MM., Mangasuli, V., Kumar, V S., SubaSree, R. and Varghes, SA. (2018). Effect of Carica papaya leaf extract (CPLE) on thrombocytopenia among dengue patients of tertiary care hospital, Chitradurga, India.International Journal of Advances in Medicine.Vol 5, No 4 DOI: http://dx.doi.org/10.18203/23 49-3933.ijam20183131

WHO (2012). Global Strategy for Dengue Prevention and Control, 2012-2020. Geneva: WHO Press.

WHO (2020). Dengue and severe dengue. Retrieved from https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue.