

Salutary effects of *carica papaya* leaf extract in dengue fever patients – a pilot study

S Hettige¹

Sri Lankan Family Physician, 2008, **29**, 17-19

Introduction

Dengue is a mosquito-borne infection which in recent decades has become a major international public health problem. Dengue is prevalent in tropical and sub-tropical regions around the world, predominantly in urban and semi-urban areas¹. In Sri Lanka dengue is currently also spreading to rural areas and has reached epidemic proportions. It has become a major public health problem².

Dengue Haemorrhagic Fever (DHF), a potentially lethal complication, was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand. Today DHF affects most Asian countries and has become a leading cause of hospitalization and death among children in the region¹.

There are four distinct types, but closely related viruses which cause dengue. Recovery from infection by one type provides lifelong immunity against that virus but confers only partial and transient protection against subsequent infection by the other three types of viruses. There is evidence that sequential infection increases the risk of developing DHF³.

Up to date there is no specific treatment for dengue fever. Lack of adequate global interest and funding have greatly restricted the development of treatment regimes⁴. The current dengue epidemic has resulted in over 200 deaths in Sri Lanka².

Ayurvedic literature reveals that papaya (*Carica papaya*) leaf extract has haemostatic and other medicinal properties^{5,6,7,8,9}. Further, recent e-mails and internet communications revealed the beneficial effects of papaya leaf extract in Asian patients who have dengue haemorrhagic fever^{10,11}. However, no formal research has been done on the subject.

It is important to conduct appropriate clinical research on this cheap freely available herbal therapy.

One sinister feature in dengue fever is the rapid fall in the platelet counts (PLT) which may lead to deadly complications such as Dengue Haemorrhagic Fever (DHF)

and Dengue Shock Syndrome (DSS). This pilot study was undertaken to find out whether *carica papaya* leaf extract had any effect on increasing the lowered platelet count.

Method

Patients fulfilling all the following inclusion criteria were admitted to the pilot study as having dengue fever: (1) Patients from dengue prevalent region at time of a dengue epidemic (2) Fever of ≥ 3 -day duration. (3) Strong clinical suspicion of dengue (4) Platelet count < 130000 per cu.mm. (4) Dengue PCR or serologically positive cases (Results were available only in six patients due to economic reasons). (6) > 5 years of age.

Twelve patients under my clinical care and fulfilling the above inclusion criteria diagnosed as dengue fever and declining hospital admission, were given a drink of papaya leaf extract-two 5ml doses at an 8 hour interval for adults and two 2.5 ml doses at an 8 hour interval for children < 10 years. Before the treatment, the procedure and the possible outcomes was explained to the patient. The papaya leaf extract was prepared by crushing two (2) tender fresh papaya leaves (not too young – not too mature, using only the leafy part removing the stalks) and squeezing the juice by hand. The juice was given for drinking without diluting. Prior to the intake of papaya leaf juice, a sample of blood was obtained to determine the white cell count, platelet count, alanine aminotransferase (ALT) and packed cell volume. A second sample of blood was obtained, the next day, to determine the white cell count, platelet count, ALT and PCV. Tests were done using an automated system and confirmed manually.

The clinical condition was also assessed before and after treatment. The patients were observed for adverse effects for about two weeks and were asked to report any abnormal signs and symptoms promptly.

The usual management of the patient continued before and after the *carica papaya* depending on the patient's clinical condition which was mainly fluid orally, anti emetics, paracetamol and antibiotics in few patients. Drugs which were likely to alter the platelet count such as blood products, prednisolone or non steroidal anti-inflammatory drugs were not administered on these patients.

¹ *Family Physician, Maharagama.*

Results and discussion

Table 1. White cell count before and after treatment with *carica papaya* leaf extract.
Two 5ml doses at an 8 hour interval for adults and two 2.5 ml doses at an 8 hour interval for children <10 years.
Day of intervention is indicated by the *symbol.

Patient No	Age in years Male-M Female-F	Day 1 Per cu.mm	Day 2 Per cu.mm	Day 3 Per cu.mm	Day 4 Per cu.mm	Day 5 Per cu.mm	Day 6 Per cu.mm	Day 7 Per cu.mm	Day 8 Per cu.mm	Day 9 Per cu.mm
1	24/F			9200		1880	*2600	6000		10200
2	5/F		8200		2800	3100	*3700	5390		
3	18/M			4300		*3600	4500	6800		
4	7/F					*2100	4270	6700		
5	55/M	7340			3450	2700	*2400	3930		8700
6	20/M		7100				*2100	4300	8400	
7	12/F					4300	*2500	4100		7600
8	38/M								*4290	4700
9	6/M			*5400	6700			9300		
10	26/F				5350		*2700		3050	
11	8/F			6640	5200	*4900	5400		7000	
12	44/M	10200					*2100	3200	3500	

In patients having dengue fever with low total white cell counts, papaya leaf juice was found to elevate the lowered total white sell counts.

Table 2. Platelet counts before and after treatment with *carica papaya* leaf extract.
Two 5ml doses at an 8 hour interval for adults and two 2.5 ml doses at an 8 hour interval for children <10 years.
Day of intervention is indicated by the *symbol.

Patient No	Age in years Male-M Female-F	Day 1 Per cu.mm	Day 2 Per cu.mm	Day 3 Per cu.mm	Day 4 Per cu.mm	Day 5 Per cu.mm	Day 6 Per cu.mm	Day 7 Per cu.mm	Day 8 Per cu.mm	Day 9 Per cu.mm
1	24/F			210000		156000	*112000	185000		230000
2	5/F		270000		165000	142000	*123000	150000		
3	18/M			150000		*85000	120000	155000		
4	7/F					*70000	92000	120000		
5	55/M	250000			122000	110000	*80000	95000		150000
6	20/M		210000				*75000	84000	120000	
7	12/F					96000	*56000	97000		210000
8	38/M								*83000	110000
9	6/M			*120000	150000			175000		
10	26/F				144000		*92000		150000	
11	8/F			166000	124000	*105000	133000		144000	
12	44/M	275000					*107000	110000	1190000	

In patients having dengue fever with low total white cell counts, papaya leaf juice was found to elevate the lowered total white sell counts.

Discussion

From the above results it was evident that both the platelet counts and the total white cell counts had increased in all patients within 24 hours after administering papaya leaf juice. It is known that the platelet count drops in dengue patients after the first three days of fever and the gradually increases after the 7th day or drop further with derangement of other clotting factors to develop into dengue hemorrhagic state³. It was significant to observe that the platelet count increased in all 12 patients with two doses of papaya leaf juice and all patients recovered with no hospital admission.

Eight patients did not have a significant increase in the packed cell volume or the SGPT levels at the time of intervention. Four patients with elevated SGPT had their counts reduced by 1/3 in the second day after intervention. Five patients with PLT < 100000 had itching haemorrhagic skin rash which disappeared within two days of treatment with, papaya leaf juice.

This pilot study has shown the effects of papaya leaf juice in dengue patients of elevating the total white cell counts, platelet counts and recovery without hospital admission.

An adequate sample after obtaining ethical approval and advice from a statistician, doing clotting profiles before and after papaya intervention and using a control group would provide an answer to the question is papaya leaf extract effective in elevating the platelet count and clotting factors which are compromised in dengue fever.

References

1. Dengue/dengue haemorrhagic fever <http://www.who.int/csr/disease/dengue/en/> Accessed at 7th Jun 2009.
2. The Official Government News Portal of Sri Lanka Beware – 9 Jun 2009. Special arrow Beware!!! Dengue knocking at your door. <http://www.news.lk> Accessed 7th July 2009.
3. World Health Organization prevention and control of dengue haemorrhagic fever: diagnosis, treatment, Comprehensive guidelines. World Health Organization Regional Publication 1999, SEARO, No.29.
4. Dengue fever http://en.wikipedia.org/wiki/Dengue_fever Accessed 14th Aug 2009.
5. David S. Seigler, Guido F. Pauli Adolf, Nahrstedt and Rosemary Leen. *Cyanogenic allosides and glucosides from Passiflora edulis and Carica papaya*. *Phytochemistry* 2000; **60**: 873-882.
6. Bourdy G, DeWalt SJ, Chávez de Michel LR, Roca A, Deharo EV, Muñoz L. Balderrama, Quenevo C, Gimenez A. Medicinal plants uses of the Tacana, an Amazonian Bolivian ethnic group. *Journal of Ethnopharmacology* 2000; **70**: 87-109.
7. Philippine medicinal plants <http://www.stuartxchange.org/Papaya.html> Accessed 14th Aug 2009.
8. Indran M, Mahmood AA, Kuppusamy UR. Protective effect of *Carica papaya* L leaf extract against alcohol induced acute gastric damage and blood oxidative stress in rats. *West Indian Med. J.* 2008; **57**: 4.
9. *Papaya Leaf Juice curing cancer* www.whatsonxiamen.com/wine_msg.php?titleid=502 Updated: 2009-03-31. Accessed 14th Aug 2009.
10. Papaya Leaf Juice – Remedy For Dengue fever. <http://shine.yahoo.com/channel/health/papaya-leaf-juice-remedy-for-dengue-fever-252188>. Accessed 18th Aug 2009.
11. Treating Chikungunya and Dengue with papaya leaf juice – 10-21-2006, 12:34 AM. Accessed 19th Aug 2009.

Goodness deserves credit only in those who are strong
enough to do evil. In other cases it is usually laziness or want of character.
– Rochefoucauld

Men of the noblest dispositions think themselves happiest when others share their
happiness with them – Duncan

Every great and commanding movement in the annals of the world is the triumph of
enthusiasm – Nothing great was ever achieved without it. – R. W. Emerson