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Impact of Nutrient-Rich Juice Therapy and a Balanced Diet on the Rapid Restoration of Hematological and Biochemical Parameters in Post-Dengue Recovery: A Single Case Report

Jincemol PC,[1*] Geetha B. Shetty,[2] Prashanth Shetty [3]

[1] PG Scholar, [2] Dean, [3] Professor, Department of Diet and Nutrition, SDM College of Naturopathy and Yogic Sciences, Ujire, Dakshina Kannada, India.

ABSTRACT:

Dengue fever is a mosquito-borne viral infection that has expanded globally and poses significant public health challenges, while insufficient nutritional support may hinder the recovery phase and consequently result in complications, increased morbidity, and mortality. This case report aimed to provide nutrient-rich juice therapy and a balanced diet in post-dengue recovery. A 43 year-old male patient visited our outpatient clinic after hospitalization from dengue fever and he was prescribed a nutrient-dense juice therapy (includes Indian gooseberry, pomegranate, apple, beetroot, carrot, lemon, kiwi, chia seeds, *nigella sativa*) combined with a balanced diet for seven weeks. Also, he was advised to avoid sugar, canned juices, alcoholic beverages, and processed junk foods. The results demonstrated a progressive increase in hemoglobin level, platelet count, and Total count, alongside a notable reduction in liver enzymes. Also, there was a significant reduction in total cholesterol, triglycerides, and Low-density lipoprotein. No noticeable change in HDL Cholesterol indicates no adverse effects of the diet on lipid metabolism. Serum creatinine levels showed slight normalization, decreasing from 1.23 mg/dL to 1.2 mg/dL, which is within normal limits. The present case report concludes that tailored nutrient-rich juice therapy along with a balanced diet as an adjunct in the rapid restoration of hematological and biochemical parameters in post-dengue recovery.

KEYWORDS: Balanced diet, Dengue recovery, Liver function, Nutrient rich juice, Platelet count.

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***Corresponding Author:**
Dr. Jincemol PC
Email: jincepoikunnel@gmail.com
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INTRODUCTION:

Dengue fever is a mosquito-borne viral infection transmitted by Aedes mosquitoes that poses significant public health challenges, particularly in tropical regions, with approximately 500 million individuals at risk globally, causing significant morbidity and mortality. [1] Dengue fever has the potential to induce considerable complications that impact hematological and hepatic profiles, which are essential for effective patient management. Hematological complications encompass thrombocytopenia and leukopenia. [2] The pathophysiology of dengue fever significantly influences hepatic functions, which is unequivocally correlated with the elevation of liver enzymes (AST, ALT), bilirubin levels, and an extended prothrombin time.[3]

Recovery from post-dengue complications is crucial as persistent symptoms like fatigue and cognitive impairment significantly impact mental health and overall quality of life. Addressing these chronic sequelae is essential for improving patient outcomes and societal productivity in dengue-endemic areas. [4] The traditional approach to the management of post-dengue recovery prioritizes supportive care, which encompasses pain management, fluid replenishment, maintenance of electrolyte equilibrium, and nutritional support aimed at restoring normal biochemical and hematological parameters as well as immune function. [5]

Diet plays an important role in recovery from dengue[6]. Foods abundant in nutrients, such as Indian gooseberry, kiwi, pomegranate, lemon, apple[7, 8], and tomato, which are typically rich in vitamin C, minerals, and bioactive compounds, can enhance immune function, mitigate oxidative stress, facilitate platelet regeneration, and promote liver detoxification[9]. The Dietary Approach to Reduce Viral Sickness (DARVS) emphasizes a balanced diet including whole grains, vegetables, proteins, dairy, fruits, and healthy oils, alongside essential micronutrients like vitamins A, C, D, E, selenium, and zinc, which support recovery and enhance immunity post-dengue[10].

The current study aims to evaluate the impact of nutrient-rich juice therapy combined with a balanced diet in a patient on post-dengue recovery, specifically evaluating the changes in complete blood count, Lipid profile, and liver function. Through the evaluation of these clinical parameters, this study aims to enhance the comprehension of how dietary modifications may facilitate the recovery process and potentially ameliorate clinical outcomes for patients in the post-dengue phase.

CASE HISTORY:

A 43-year-old male patient normotensive, non-diabetic hailing from an urban area in southern India visited our outpatient clinic after hospitalization from dengue fever, confirmed by positive NS1 antigen IgM antibodies. Post-discharge he reported persistent symptoms including generalized body weakness, extreme fatigue, intermittent body pain, and impeding daily activities. The hematological and biochemical laboratory findings at the time of the first visit to the clinic showed a platelet count of 80,000 cells/cumm, hemoglobin level of 14.5 g//dL, white blood cell (WBC) count of 4100 Cells/cumm, and elevated liver enzymes, with SGOT at 106IU/L, SGPT at 125 IU/L. His serum Creatinine level was 1.24 mg/dL.

THERAPEUTIC INTERVENTION:

The patient has signed and approved the consent form. The laboratory findings at the time of the first visit to the clinic were considered as a baseline assessment. A nutritional intervention was recommended for the patient over 7 weeks, followed by a subsequent blood test conducted after 3 weeks (2nd visit) and 7 weeks (3rd visit) from baseline. During the initial consultation at our clinic, the patient was informed about the nutrient-dense juice therapy, which entails the consumption of freshly prepared Indian Gooseberry Juice on an empty stomach at 7.30 am, followed by a concoction of freshly juiced Pomegranate, beetroot, carrot, tomato, and apple, fortified with one teaspoon of black cumin seed powder at 11:00 am. This regimen is succeeded by the intake of one tablespoon of lemon juice, which is to be diluted in 250 mL of lukewarm water and amalgamated with one tablespoon of soaked chia seeds, along with the recommendation to incorporate two kiwis at 4:30 pm. Furthermore, the patient was counselled to adhere to a balanced diet comprising whole grains such as foods derived from finger millet, oats, quinoa, and wheat, in addition to vegetables, pulses, lean meats, dairy products, fruits, and healthy oils, particularly olive oil. Additionally, the patient was advised to refrain from the consumption of table sugar, canned juices, alcoholic beverages, and processed junk foods.

RESULTS

In the current case report, the patient was recommended to follow a nutrient-rich juice therapy combined with a balanced diet to support the post-dengue recovery. A marked improvement was observed in the hematological and biochemical parameters after 7 weeks of intervention in the patient.

Hematological parameters:

Hemoglobin levels were increased from 14.2 mg/dL to 16.2 mg/dL showed in (Fig 1). Platelet count showed (Fig 2) a notable increase from 80,000 cells/cumm to 204000 cells/cumm suggesting effective support for platelet recovery. White blood cell (WBC) count improved to 7000 cells/cumm, from a baseline of 4100 cells/cumm reaching near-normal levels (Fig 3), indicative of immune system recovery.

Liver Function Tests and Serum Creatinine

SGOT levels decreased from 183 IU/L to 57 IU/L, and SGPT levels dropped from 363 IU/L to 113 IU/L as shown in (Fig 4), reflecting substantial liver function improvement. Serum creatinine levels showed slight normalization, decreasing from 1.23 mg/dL to 1.2 mg/dL, which is within normal limits.

Biochemical parameters

A considerable decrease was observed in total cholesterol levels, which diminished from 250 mg/dl to 218 mg/dl, triglycerides from 472 mg/dl to 255 mg/dl, LDL from 137 mg/dl to 118 mg/dl, and VLDL from 94 mg/dl to 51 mg/dl as shown in (fig 5) by the end of the seventh week of intervention compared to the initial visit. However, no enhancement was recorded in HDL levels.

Clinical Symptom Improvement

The patient reported significant improvement in body weakness, fatigue, and body pain by the third week of intervention. By the seventh week, he resumed normal daily activities with minimal discomfort, signifying an enhanced overall quality of life.

Table -1: Hematological Parameters:

				Differential Count (%)					
Days	**Hemoglobin (gm/dl)**	**Platelet (cells/mm^3)**	**Total Count (cells/cum)**	**Lymphocyte**	**Neutrophil**	**Eosinophil**	**Monocyte**	**Basophil**	**ESR (1st /hour)**
1st VISIT	14.5	80,000	4100	10.8	78.2	00	10.5	00	0.4
2nd VISIT	15.2	194000	5480	45	44	05	06	00	02
3rd VISIT	16.2	204000	7000	38	50	05	07	00	02

Table- 2: Lipid profile:

Days	**Total cholesterol (mg/dl)**	**Triglycerides (mg/ dl)**	**HDL – C (mg/dl)**	**LDL-C (mg/dl)**	**VLDL (mg/dl)**	**Total Cholesterol/HDL Chol Ratio**	**LDL/HDL**
1st VISIT	250	470	38	137	94	6.5	3.6
2nd VISIT	230	385	36	128	62	6.3	3.5
3rd VISIT	218	255	34	118	51	6.4	3.4

Table- 3: Liver Profile and serum creatinine:

Days	**Bilirubin Total (mg/dl)**	**Biirubin Conjugated (mg/dl)**	**Bilirubin Uncongugated (mg/dl)**	**SGOT (IU/L)**	**SGPT (IU/L)**	**Alkaline phosphatase (IU/L)**	**Total protein (gms/dl)**	**Albumin (gms/dl)**	**Globulin (gms/dl)**	**A/G ratio**	**GGT (IU/L)**	**S. creatinine**
1st VISIT	0.9	0.3	0.7	183	363	172	7.2	3.5	3.7	0.95	96	1.24
2nd VISIT	0.8	0.2	0.7	54	129	65	8.3	4.5	3.8	1.18	46	1.14
3rd VISIT	0.7	0.2	0.5	57	113	87	8.0	4.3	3.7	1.2	47	1.2

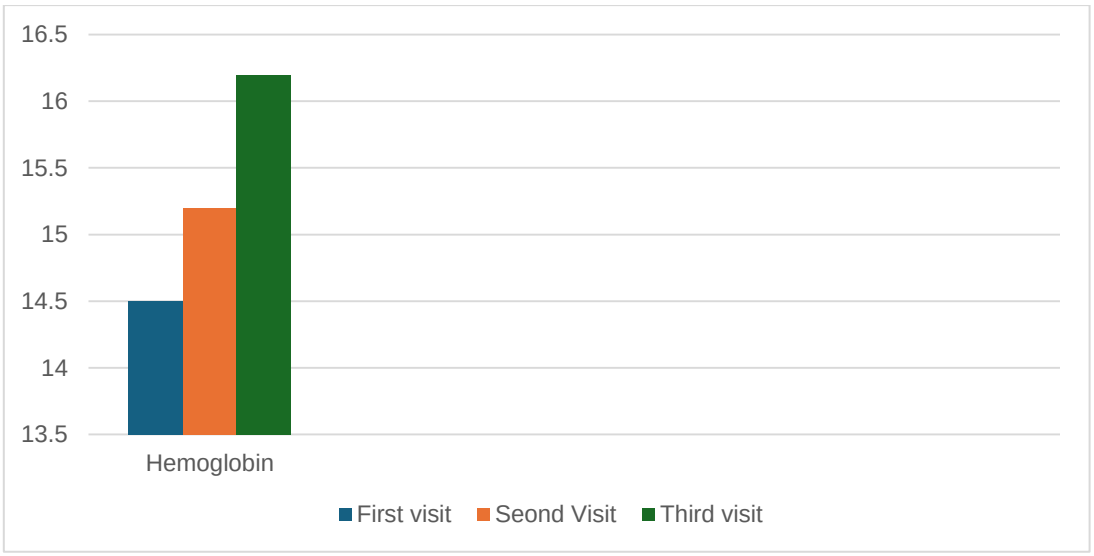

Figure 1: Changes in Hemoglobin

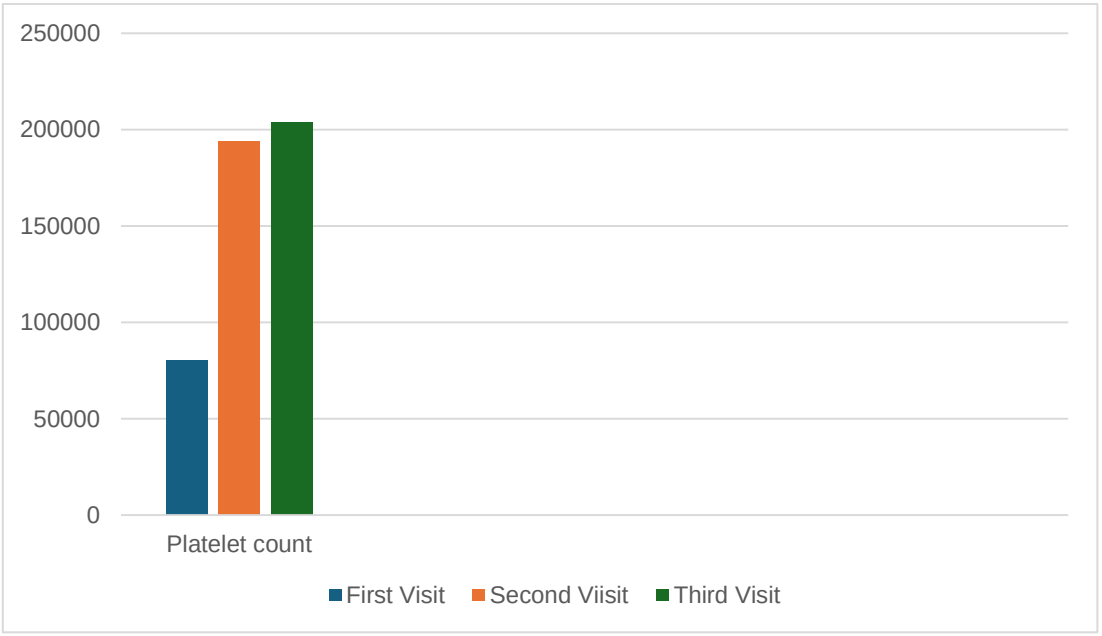

Figure 2: Changes in platelet count

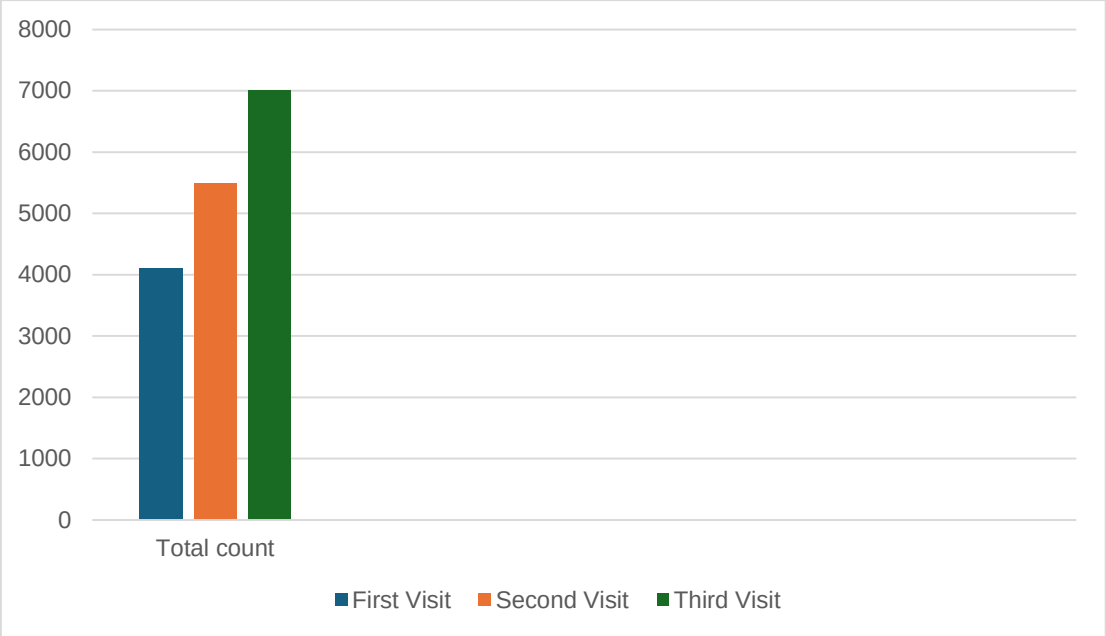

Figure 3: Changes in total count

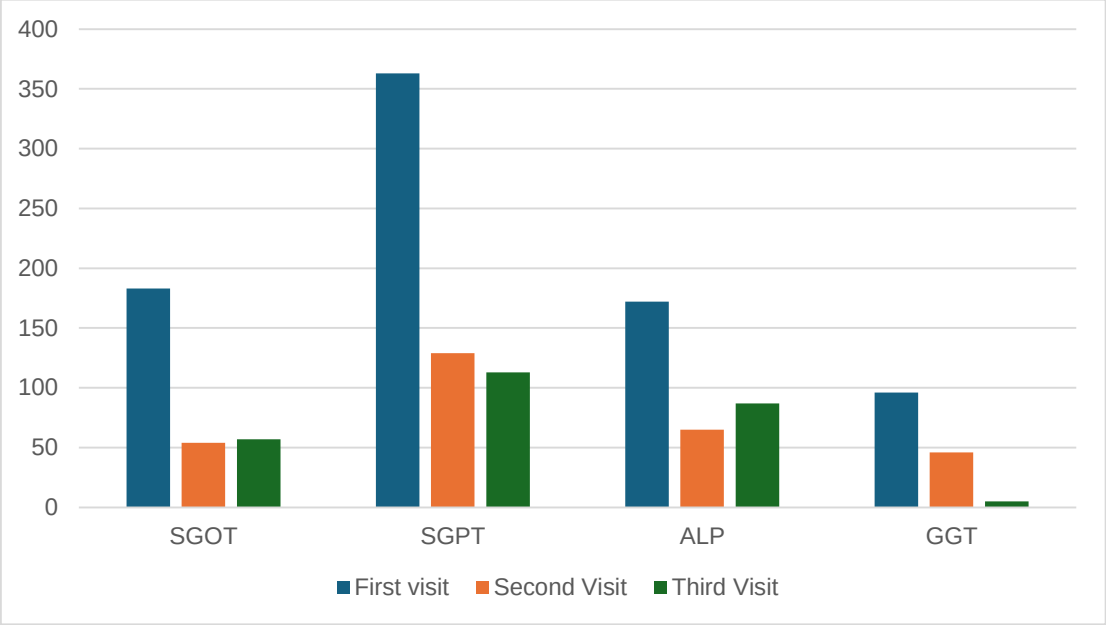

Figure 4: Changes in Liver Profile

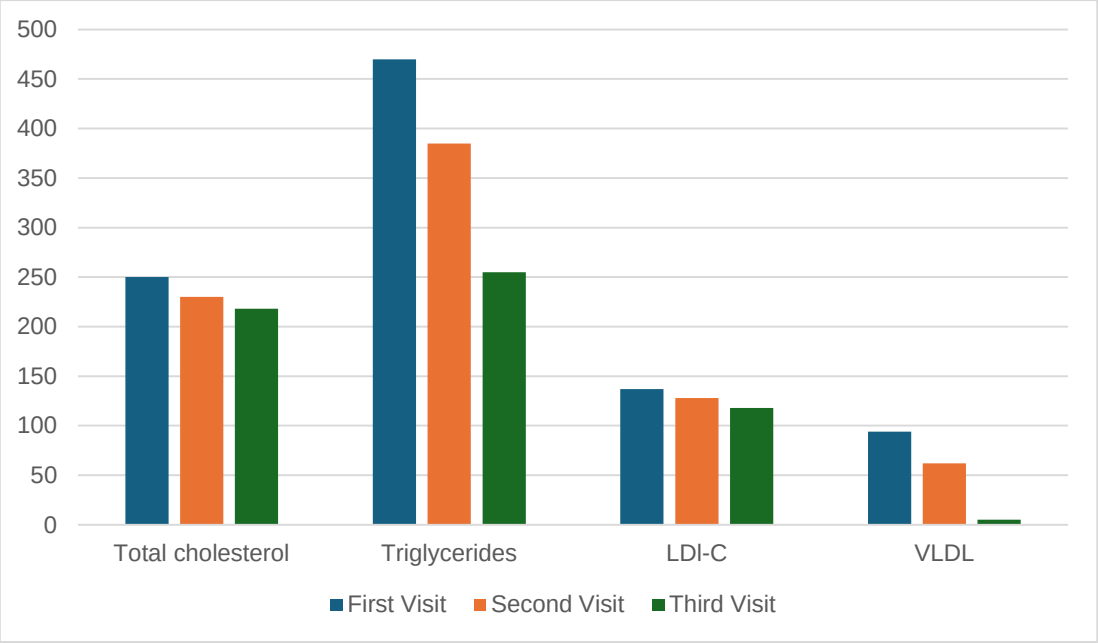

Figure 5: Changes in Lipid Profile

DISCUSSION:

Dengue fever is a mosquito-borne viral infection that can lead to significant complications and elevation in hematological parameters such as thrombocytopenia, and leukopenia with dysregulation in hepatic function and presented with elevation in liver enzymes and inflammatory markers. Also noticed disturbances in lipid profile in this patient. The post-dengue recovery phase often requires focused interventions to accelerate tissue repair, immune system reconstitution, and the normalization of hematological and biochemical indices.

The current case report, highlights the positive impact of a targeted nutritional intervention, emphasizing nutrient-rich juice therapy and a balanced diet for 7 weeks, on the rapid restoration of hematological and biochemical parameters during post-dengue recovery. Emblica Officinalis (Indian Gooseberry/Amla) is often utilized in traditional medicine and the incorporation of amla juice in the morning leveraged its high vitamin C content and has anti-inflammatory, antioxidant, hypoglycemic, immunomodulatory and hypolipidemic properties facilitating recovery in viral infections like dengue[11].

The mid-morning concoction of fresh juice Pomegranate, beetroot, carrot, tomato, and apple, fortified with one teaspoon of black cumin powder provided a rich source of essential vitamins, iron, folate, and bioactive compounds and polyphenols promoting health, immunity and likely contributed to improving hemoglobin levels and platelet counts. Another study found that pomegranate juice impacts complete blood count parameters in healthy individuals, showing increased red blood cell count and hemoglobin levels. It has been shown that a high polyphenol plays a crucial role in the prevention of red blood cell destruction and hemoglobin oxidation by lowering oxidative stress, which would be a plausible explanation for the current study's findings [12,13].

Nigella sativa, recognized for its immunomodulatory and hepatoprotective effects, may have supported liver function

and reduced inflammatory markers, aligning with findings from recent reviews on herbal interventions in post-viral syndromes[14]. It is rich in polyunsaturated fatty acids, fat-soluble vitamins, particularly tocopherols, which reduce LDL oxidative modification and facilitate cholesterol clearance. Sterols, particularly β-sitosterol, inhibit cholesterol absorption. Thymoquinone, an active ingredient, has hypocholesterolemic potential[15,16].

The evening intake of lemon water with chia seeds and kiwis enriched the diet with soluble fiber, vitamin C, omega-3 fatty acids, and antioxidants. Chia seeds, rich in phenolic compounds and alpha-linolenic acid, may have supported cell membrane repair and inflammation reduction[17], while antioxidant properties of vitamin C in kiwi fruit, shown to enhance both innate and adaptive immune responses through enhancing leukocyte function and also including chemotaxis and oxidant generation, which are vital for pathogen defense platelet recovery[18].

A healthy balanced diet provides a large number of micronutrients, such as minerals, and vitamins, as well as some macronutrients such as some amino acids, cholesterol, and fatty acids demonstrated to exert a very important and specific impact on appropriate immune activity[19]. Nutrients control inflammatory cytokine expression through interaction with Toll-like receptors (TLRs), crucial for the innate immune system. These proteins, located in macrophages and dendritic cells, affect immune cell activity, leading to oxidative stress and inflammation, ultimately affecting immune function. The diet was rich in finger millet, and quinoa is beneficial for post-dengue recovery due to its high iron and essential amino acid bioavailability. Finger millet increases iron absorption by threefold, while quinoa is rich in protein, essential amino acids, and minerals, including iron which can aid in combating malnutrition and potentially address anemia[20].

CONCLUSION:

The present case report concludes the impact of nutrient-rich juice therapy combined with a balanced diet can enhance the rapid recovery process during the post-dengue phase and prevent complications. The six-week intervention demonstrated a notable improvement in hemoglobin levels, platelet counts, and total white blood cell counts, in addition to a decrease in serum glutamic oxaloacetic transaminase (SGOT) and serum glutamic pyruvic transaminase (SGPT) levels, indicating an improvement in hepatic function. Furthermore, a decline in the lipid profile was observed, coupled with a comprehensive enhancement of overall health.

Limitations of the study

This study is based on a single patient's response to nutrient-rich juice therapy and a balanced diet. The findings cannot be generalized to a larger population without further trials or studies. The study period of seven weeks is relatively short to evaluate the long-term effects of nutrient-rich juice therapy on post-dengue recovery, including sustained platelet count and liver function.

Clinical implications and recommendations:

The present case study emphasizes the importance of adequate nutrition and a well-structured dietetic regimen as an adjunct in post-dengue recovery. The tailored use of specific juices and a healthy balanced diet provides a practical, non-

invasive, and cost-effective strategy to optimize recovery outcomes. Subsequent investigations, such as randomized controlled trials, are necessary to validate these observations and to examine the feasibility of analogous interventions across broader populations.

Conflict of interest: The author declares that there is no conflict of interest.

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