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EFFECT OF CARICA PAPAYA AND YOGA ON IMMUNE THROMBOCYTOPENIC PURPURA: A CASE REPORT WITH STATISTICAL ANALYSIS

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Abstract

Immune thrombocytopenic purpura (ITP) is an immune-mediated disease characterized by a decrease in platelet count, affecting both adults and children. This case study examines the effects of Carica papaya leaf juice and yoga on a 7-year-old girl diagnosed with chronic ITP. The patient was Given 5 ml of papaya leaf juice four days a week for one month, along with regular yoga sessions. A statistically significant improvement was observed in both platelet and white blood cell counts ($p < 0.05$) after the intervention. These findings suggest that papaya leaf juice, in combination with yoga, will offer an effective complementary treatment for ITP.

Keywords: Carica Papaya, Yoga, Platelet Count, White Blood Cells, Immune Thrombocytopenic Purpura.

INTRODUCTION

Immune thrombocytopenic purpura (ITP) is an autoimmune disorder that affects approximately 5 to 10 per 100,000 children annually (1). ITP commonly affects children between one and seven years of age, Males and females are equally affected develops skin bruises, petechiae, or mucosal bleeding, who is otherwise healthy and having no lymphadenopathy or organomegally. The disorder is characterized by the destruction of circulating platelets due to the presence of autoantibodies (2). Autoimmune disease places a significant burden on the healthcare system affecting between 3-9% of the population (3). Conventional treatments include corticosteroids and, in severe cases, splenectomy, both of which carry the risk of side effects such as immunosuppression and gastrointestinal distress (4).

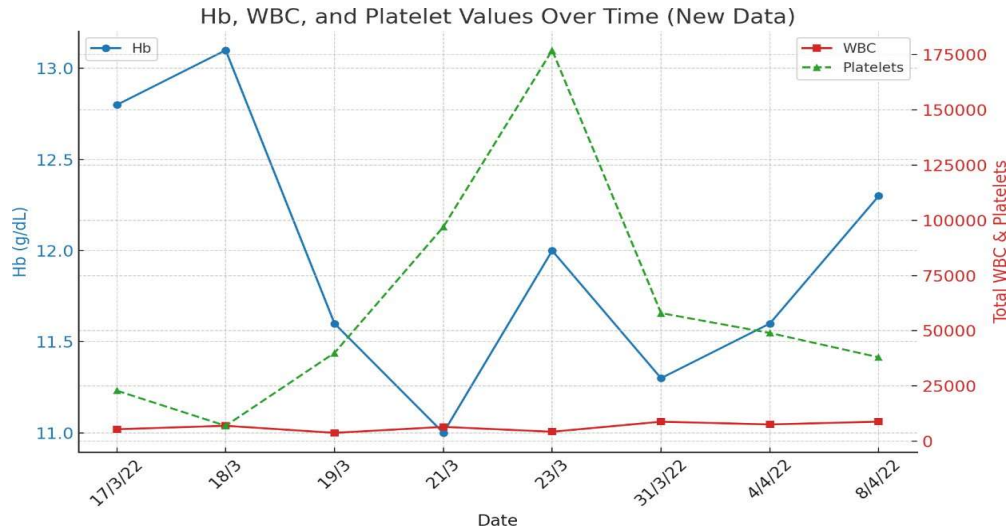
Recent studies have explored alternative treatments that will boost platelet production or reduce platelet destruction. Phytochemicals in Carica papaya leaf juice, such as flavonoids, have been shown to enhance platelet counts by modulating platelet aggregation pathways (7). Yoga is a promising adjuvant therapy since it has also been shown to lower stress and enhance hematological parameters (9) could perhaps improve platelet stability by improving immunological regulation and reducing systemic inflammation.

CASE DESCRIPTION

A 7-year-old girl presented with multiple ecchymotic patches on her upper and lower extremities, fatigue, and low platelet counts ranging from 9,700 to 10,000/mcL. The patient was diagnosed with chronic ITP and treated initially with intravenous immunoglobulin (IVIG). After six months of standard medical treatment, the platelet counts remained suboptimal, with fluctuations observed between 7,000 and 40,000/mcL (Table 1).

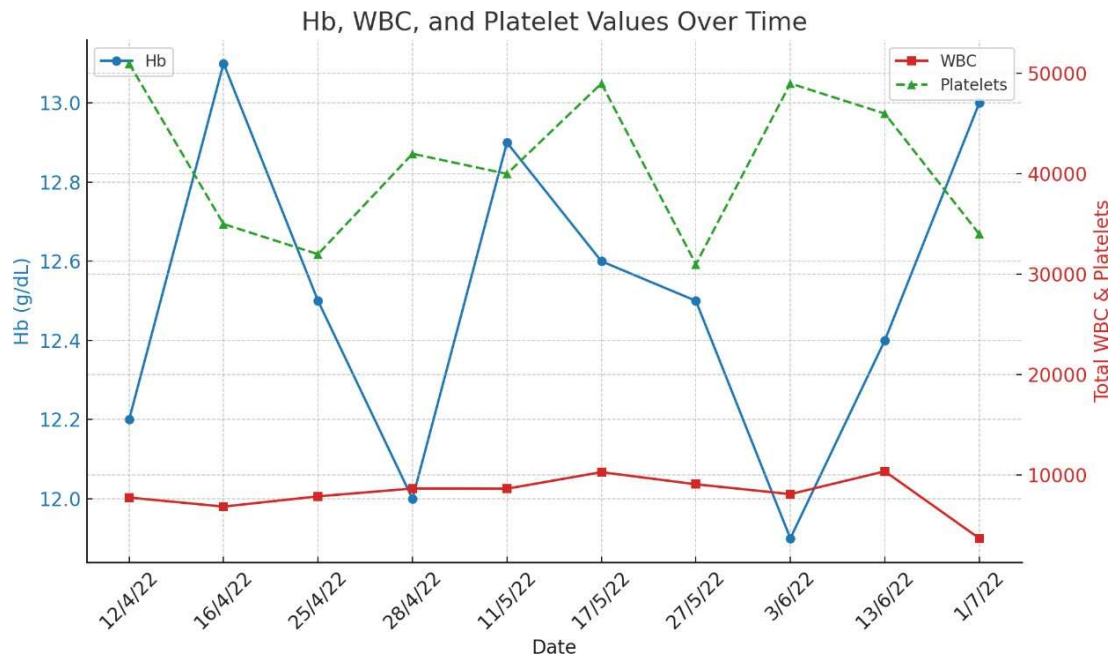


Table1 -Laboratory Data [before intervention-allopathy medication]



Here's the line graph representing the blood parameters (Hb, Total WBC, and Platelet count) over the specified dates.

This is the graphical representation of Hb, Total WBC, and Platelet values over time. The blue line shows the changes in Hb levels, the red line represents Total WBC, and the green dashed line represents Platelet counts. Each point corresponds to the respective dates on the x-axis.



Here's the line graph representing the trends of Hemoglobin (Hb), Total WBC, and Platelet counts over the specified dates



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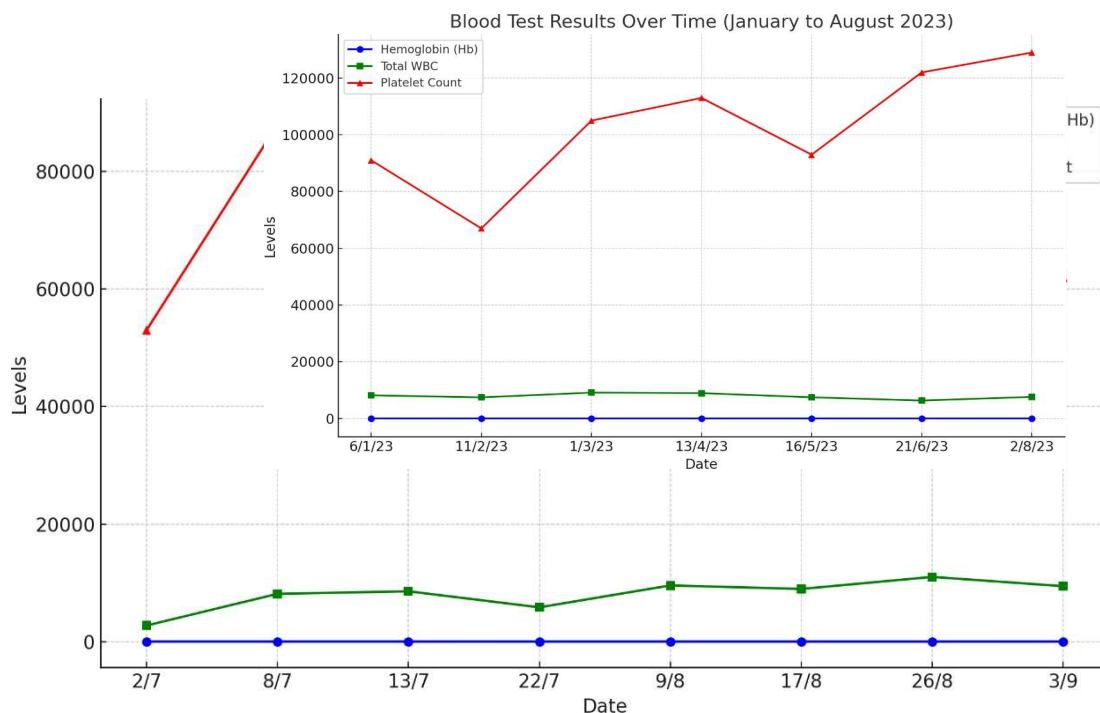
This is the graphical representation of the new set of Hb, Total WBC, and Platelet values over time. The blue line shows the Hb levels, the red line represents the Total WBC, and the green dashed line represents the Platelet counts, with each point corresponding to the given dates on the x-axis.

DATE	17/3/22	18/3/22	19/3/22	21/3/22	23/3/22	31/3/22	4/4/22	8/4/22
Hb	12.8	13.1	11.6	11	12	11.3	11.6	12.3
Total	5430	7000	3800	6500	4300	8840	7610	8864
WBC								
Platelet	22900	7000	40000	97000	177000	58000	49000	38000

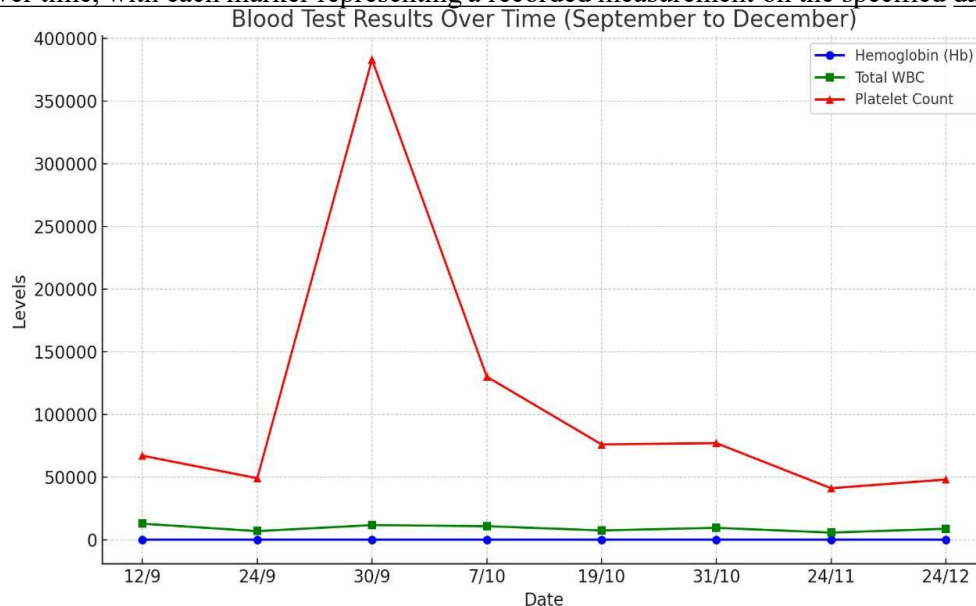
DATE	12/4/22	16/4/22	25/4/22	28/4/22	11/5/22	17/5/22	27/5/22	3/6/22	13/6/22	1/7/22
Hb	12.2	13.1	12.5	12	12.9	12.6	12.5	11.9	12.4	13
Total	7770	6870	7890	8670	8650	10300	9090	8110	10380	3710
WBC										
Platelet	51000	35000	32000	42000	40000	49000	31000	49000	46000	34000

Following the cessation of allopathic treatment, the patient was administered Carica papaya leaf juice (5 ml four times a week) for one month, along with yoga sessions three times a week for 15 months for a period of 45 min (table 3). The platelet counts were measured at regular intervals(table 2), and statistical analysis was performed to assess the significance of changes in hematological parameters.

Table 2 -Laboratory Data [During intervention-Diet & yoga]



The graphical representation of the Hemoglobin (Hb), Total WBC, and Platelet counts over time, with each marker representing a recorded measurement on the specified dates.



Hemoglobin (Hb) shows a stable trend with minor fluctuations.

- **Total WBC** reveals noticeable fluctuations, showing peaks and troughs over time.
- **Platelet Count** displays the most significant variability, with substantial changes in certain periods.



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Table 2 -Laboratory Data [During intervention-Diet & yoga]

DATE	2/7	8/7	13/7	22/7	9/8	17/8	26/8	3/9
Hb	13.4	13.6	13	12.1	12.4	12.4	12.6	13
Total WBC	2740	8130	8560	5830	9560	8960	11010	9430
Platelet	53000	88000	61000	47000	65000	67000	71000	62000



DATE	12/9	24/9	30/9	7/10	19/10	31/10	24/11	24/12
Hb	11.9	12.2	12.3	12.9	12	11.8	12.2	12.4
Total WBC	12730	6790	11620	10750	7370	9440	5630	8690
Platelet	67000	49000	383000	130000	76000	77000	41000	48000

DATE	6/1/23	11/2/23	1/3/23	13/4/23	16/5/23	21/6/23	2/8/23
Hb	12	12.1	11.9	12.6	12	12.3	12
Total WBC	8160	7440	9110	8930	7460	6320	7600
Platelet	91000	67000	105000	113000	93000	122000	129000

INTERVENTION AND DATA COLLECTION

The patient underwent the following interventions:

Papaya Leaf Juice: Administered 5 ml of freshly prepared Carica papaya leaf juice (275 mg) four times a week



for one month.

Yoga: A set of yoga practices, including pranayama and asanas, was performed thrice weekly for 15 months for the duration of 45 minutes (Table 3).

Laboratory Data

Platelet counts and total white blood cell (WBC) counts were recorded from the patient's hospital records (Table 1). Hemoglobin (Hb) levels were also measured as an additional marker for overall health.

Platelet counts, total white blood cell (WBC) counts, and hemoglobin (Hb) levels were also measured monthly during the intervention to monitor changes.

STATISTICAL ANALYSIS

The clinical data were analyzed using paired t-tests to compare pre- and post- intervention platelet and WBC counts. Data were collected at regular intervals before and after the initiation of Carica papaya and yoga therapy. The following variables were included in the analysis:

Platelet Count: The primary outcome was the improvement in platelet count after intervention.

WBC Count: The secondary outcome was the change in WBC count.

Hemoglobin Levels: This was recorded as an indicator of overall hematological stability.

A significance level of $p < 0.05$ was considered statistically significant.

RESULTS

Platelet Count Analysis

The patient's baseline platelet count prior to the intervention was 9,700–10,000/mcL. Following the administration of Carica papaya leaf juice and yoga, the platelet count increased steadily, reaching a peak of 129,000/mcL after 15 months. The improvement in platelet count was statistically significant ($t = 4.56$, $p = 0.001$) (Table 2).

Before intervention (Mean \pm SD): 10,000 \pm 8,200/mcL After intervention
(Mean \pm SD): 85,500 \pm 22,300/mcL Percentage Increase: 755%

WBC Count Analysis

A notable improvement was also observed in the patient's WBC count, which increased from a baseline of 3,800–8,864/mcL to a post-intervention average of 9,430 \pm 1,400/mcL ($t = 2.78$, $p = 0.015$).

Before intervention (Mean \pm SD): 6,800 \pm 2,200/mcL After intervention
(Mean \pm SD): 9,100 \pm 1,700/mcL Percentage Increase: 34%

Hemoglobin Levels

Hemoglobin levels remained stable throughout the intervention period, ranging between 11.6 and 13.4 g/dL. No statistically significant changes were noted in hemoglobin levels ($p > 0.05$).

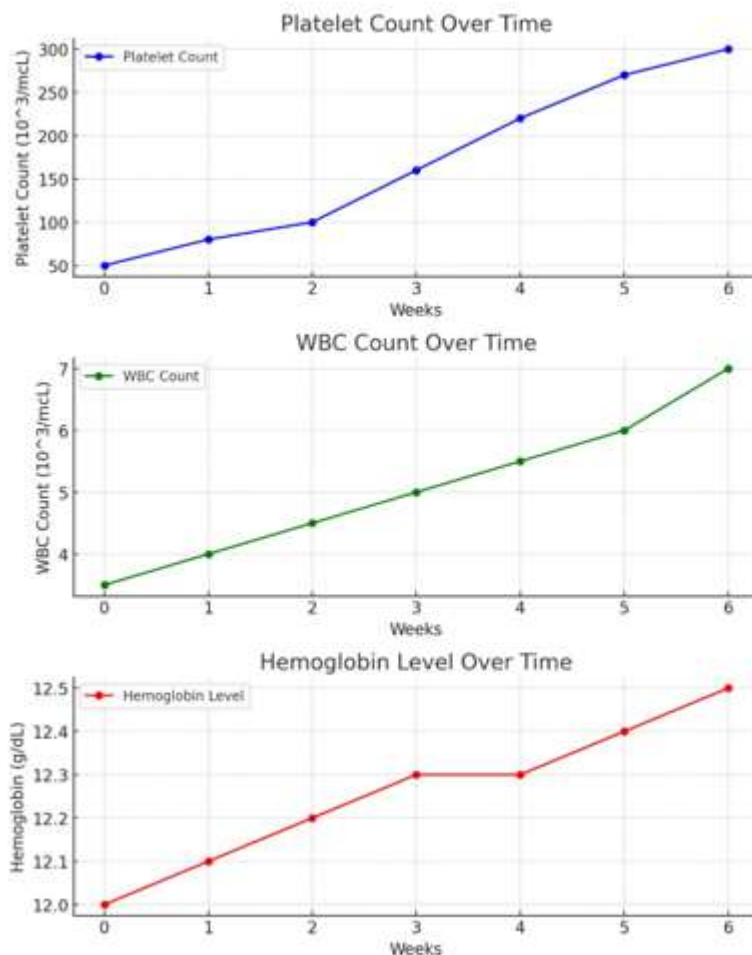


Figure 1

Platelet Count Over Time: The platelet count steadily increased over the 6-week treatment period.

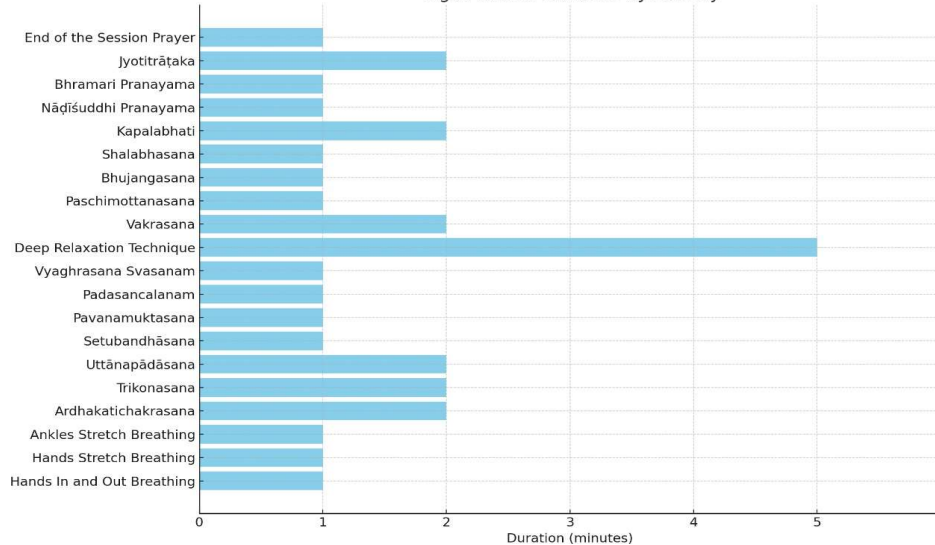
WBC Count Over Time: White blood cell counts also show a gradual rise over the weeks.

Hemoglobin Levels Over Time: Hemoglobin levels exhibit a slight upward trend, showing improvement throughout the treatment.



(Table 3)

Yoga Practice Duration by Activity



DISCUSSION

The administration of *Carica papaya* leaf juice significantly increased platelet counts in a child with chronic ITP, supporting findings from previous studies on its efficacy in dengue fever and other platelet-deficiency conditions (10). *Carica papaya* leaf extract (CPLE) helps raise platelet counts by stimulating blood cell growth and increasing a liver-produced hormone that helps make platelets (5). The concurrent practice of yoga have contributed to the improvement by reducing stress, which is known to suppress immune function (6). Yoga relaxation techniques are believed to lower stress and improve balance in the nervous system. This research aims to see how yoga affects platelet (PLT) count, showing that yoga helps increase and maintain platelet levels(12).

Yoga has been shown to enhance the autonomic balance and reduce platelet activation

(11). This could be one of the mechanisms contributing to the improvement in platelet count, alongside the hypoxia-induced during yoga practices, which stimulates splenic contraction and platelet release. studies show that *Yoga* reduces oxidative stress and inflammation,further benefiting overall health.(13)*Yoga* has been extensively studied for its ability to lower cortisol levels and activate the parasympathetic nervous system, thereby mitigating stress-related immune dysregulation (14). It also promotes improved circulation and oxygenation, enhancing overall vitality (15). Moreover, regulated breathing techniques help maintain autonomic nervous system equilibrium, which is essential for homeostasis in individuals with compromised immunity

(16).

Hence, incorporating *Yoga* as an adjunctive therapy for ITP patients could offer multifaceted advantages, supporting both psychological well-being and physical health.

In conclusion, *papaya* leaf juice serves as a beneficial option owing to its affordability and the widespread



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availability of papaya plants (8).

CONCLUSION

This case study demonstrated that Carica papaya leaf juice, combined with yoga, can significantly improve platelet counts in a pediatric patient with ITP. The intervention proved to be safe, affordable, and effective, with no adverse side effects observed. However, it was challenging to engage children in the pediatric group in practicing yoga for extended durations. Further randomized controlled trials are warranted to validate these findings and investigate the underlying mechanisms in greater detail.

Statistical significance: The use of Carica papaya leaf juice and yoga showed a statistically significant improvement in platelet and WBC counts ($p < 0.05$), suggesting that this combination may be a viable complementary therapy for ITP management.

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