

Therapeutic Potential of Plant-Based Supplement as Adjunctive Treatment in Nephrolithiasis

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DOI: <https://doi.org/10.52403/ijhsr.20241208>

ABSTRACT

Kidney stones have been one of the longest known and most common diseases of the urinary tract, with a prevalence ranging from 1% to 20%. Many plants and herbs have demonstrated potential for the treatment and prevention of kidney stones. This case study investigated the efficacy of plant-based kidney detox supplements as an adjunctive therapy for reducing symptoms and preventing recurrence of nephrolithiasis. Researchers monitored patients over a 60-day treatment period. The results showed that 60% of patients achieved complete clearance of calculi, while the remaining 40% demonstrated partial clearance or reduction in stone size. All patients experienced clinically significant improvements in symptoms, with complete resolution of abdominal pain, burning micturition, and dysuria by day 30, which continued through day 60. Urinalysis parameters demonstrated marked improvements, including the absence of red blood cells, substantial reduction in pus cells, clearance of epithelial cells, and absence or trace amounts of calcium oxalate crystals in most patients. All patients exhibited decreased serum creatinine levels. The rapid and sustained alleviation of symptoms, coupled with improved ultrasonography findings and urinalysis parameters, suggested that the plant-based kidney detox supplement could serve as an effective adjunctive therapy for managing kidney stones and associated symptoms.

Keywords: Nephrolithiasis; Kidney stone; Herbal medicine; Plant based; Varuna; Pashanbheda.

INTRODUCTION

Kidney stones, also known as Nephrolithiasis, is a widespread urological disorder with a clinically significant global impact. This condition, characterized by the formation of solid mineral deposits within the kidneys, affects approximately 12% of the world's

population at some point in their lives. The prevalence of kidney stones has been steadily increasing, with potential contributing factors including climate change and evolving dietary patterns ^[1]. Alarming, individuals with a history of kidney stones face a 60% higher risk of developing chronic kidney disease and a

40% increased likelihood of progressing to end-stage renal disease. Moreover, recent research has suggested a potential link between kidney stones and papillary renal cell carcinoma, further underscoring the importance of effective management strategies [2].

The etiology of kidney stone is multifaceted, involving a complex interplay of genetic predisposition, dietary habits, and lifestyle factors such as low physical activity [3, 4]. Calcium-containing stones represent the most prevalent type, accounting for 75-90% of cases, followed by struvite (10-15%), uric acid (3-10%), and cystine stones (0.5-1%) [5]. The pathophysiology of stone formation involves processes such as crystal nucleation, aggregation, and growth of insoluble particles within the urinary tract. These stones can lead to various complications, including flank pain, hydronephrosis, urinary obstruction, infection, and hemorrhage [6].

Currently, the management of kidney stone primarily relies on surgical interventions and pharmacological approaches. However, the surgical procedures are often complex, costly, and do not address the underlying causes of calculus formation or prevent recurrence. Pharmacotherapy options, including thiazide diuretics and alkali-citrate, aim to reduce hypercalciuria and hyperoxaluria, which contribute to calculi formation. Unfortunately, these medications have shown limited efficacy and low tolerability in many patients [7]. The limitations of conventional treatments and the high recurrence rate of kidney stone, approximately 50% within 5-10 years [8]. There is a growing interest in exploring alternative therapeutic approaches. In recent years, attention has turned to the potential of medicinal plants and natural products in the prevention and management of kidney stone. This renewed focus on herbal medicine is driven by the search for more cost-effective, better-tolerated, and potentially more efficacious treatments [9].

Medicinal plants have been utilized for centuries in traditional medicine systems worldwide for their purported benefits in alleviating kidney stone-related symptoms and inhibiting stone formation. These natural remedies are believed to exert their effects through various mechanisms, including diuretic, antispasmodic, and antioxidant activities. Furthermore, many plants contain bioactive compounds such as polyphenols, flavonoids, phytosterols, saponins, alkaloids, and terpenoids, which may contribute to their therapeutic potential in nephrolithiasis [10]. As we delve deeper into the potential of plant-based remedies, it becomes evident that they may offer a complementary or alternative approach to conventional treatments. By harnessing the power of nature's pharmacy, we may uncover new strategies to alleviate symptoms, prevent recurrence, and improve overall outcomes for individuals suffering from nephrolithiasis.

The Gplife's plant based kidney detox supplement consist of combination synergistic herbs such as *Saxifraga lingulata* (Pashanbheda), *Boerhavia diffusa* (Punarnava), *Crataeva nurvala* (Varuna), *Tribulus terrestris* (Gokhru), *Apium graveolens* (Celery), *Cucurbita pepo* (Pumpkin), etc. This formulation was manufactured by patented technology known as "Synergistic Optimize Blend Technology". This aim of this case study is to investigate the potential of Gplife Healthcare's plant-based kidney detox supplement as an adjunctive therapy for reducing symptoms and preventing recurrence of kidney stone. By exploring the bioactive compounds and mechanisms of action in the medicinal plants of the formulation, we seek to uncover new avenues for managing this prevalent and recurrent nephrolithiasis condition.

CASE PRESENTATION

A total of 10 patients were analyzed to evaluate the efficacy of Gplife Healthcare's plant-based

kidney detox supplement as an adjunctive therapy for kidney stone over a 60-day period. Out of 10 patients, 6 were male and 4 were female. The intervention treatment was adjunctive therapy given to patients diagnosed with kidney stone and related symptoms. The case study included patients with various presentations of kidney stone, with some patients having multiple calculi. Ultrasonography (USG) was used to assess calculi at baseline and after 60 days of treatment. The effects of the intervention were evaluated through USG findings, symptom assessment using Likert and grading scales, and urinalysis parameters. Symptoms monitored included abdominal pain, burning micturition, dysuria, nausea, vomiting, constipation, and weakness. During the evaluation period, adverse reactions, tolerability, and compliance with kidney detox treatment were monitored.

Treatment Regimen

The treatment protocol involved administering 1 tablet of the kidney detox supplement twice daily before meals to all subjects participating in the case studies. This dosage regimen was consistently followed throughout the duration of the study period.

RESULT

Effect of intervention on USG findings of patients

In this case study, 10 patients with kidney stone were evaluated using USG at baseline and after 60 days of treatment. The baseline USG revealed a variety of calculi presentations, including ureteric calculi, kidney stone, and associated conditions such as hydronephrosis and hydroureter. Stone sizes ranged from 3 mm to 16 mm, with some patients presenting multiple calculi.

After 60 days of treatment, clinically significant improvements were observed in all

patients. Of the 10 patients, 6 (60%) showed complete clearance of calculi. The remaining 4 patients demonstrated partial clearance or reduction in stone size. One patient progressed from having over 60 tiny calculi to only a trace amount. Another patient experienced a 50% reduction in the size of the right kidney stone (from 16 mm to 8 mm) and a 33% reduction in the left kidney stone (from 6 mm to 4 mm). A third patient showed a clinically significant reduction in calculus size (from 12x12 mm to 6x4 mm) and resolution of hydronephrosis. The fourth patient experienced complete clearance of the calculus with persistence of mild hydronephrosis.

Overall, this case study demonstrated a 60% complete clearance rate and a 100% improvement rate, with all patients showing either complete resolution or reduction in calculus size and associated symptoms. These results suggest promising efficacy of the plant-based kidney detox supplement in managing kidney stone.

Assessment of symptoms based on Linkert and Grading scale

Effect of intervention on abdominal pain

The assessment of abdominal pain, based on a 4-point Likert scale (0-None, 1-Mild, 2-Moderate, 3-Severe), revealed an improvement over the course of the study. At baseline, 60% of participants reported severe abdominal pain, with 20% experiencing moderate pain and 20% mild pain. By Day 15, a marked reduction in pain severity was observed, with 70% of participants reporting no pain and 30% experiencing only mild pain. This improvement continued, with all participants (100%) reporting complete resolution of abdominal pain by Day 30, a status that was maintained through Day 60. The rapid and sustained alleviation of abdominal pain suggests a potentially effective intervention (Table 1 & Figure 1).

Table 1: Assessment of abdominal pain

Score	Abdominal pain in number of patients (%)			
	Baseline	Day 15	Day 30	Day 60
0(None)	-	7 (70%)	10 (100%)	10 (100%)
1 (Mild)	2 (20%)	3 (30%)	-	-
2 (Moderate)	2 (20%)	-	-	-
3 (Severe)	6 (60%)	-	-	-

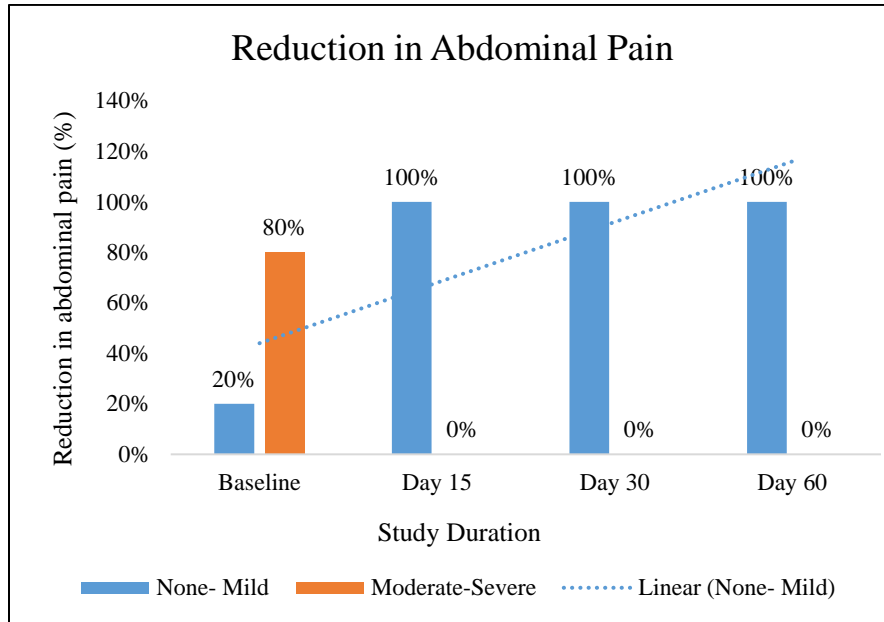


Figure 1: Reduction in abdominal pain

Effect of intervention on burning micturition

Burning micturition was assessed using a grading scale: 0 (no burning micturition, clear urine), 1 (occasional burning but clear urine), and 2 (occasional burning micturition, mild pain after displacement requiring treatment). At baseline, 80% of participants experienced grade 2 burning micturition, while 20% had grade 1. By day 15, a clinically significant

improvement was observed, with 80% of participants reporting no burning micturition (grade 0) and 20% experiencing occasional burning (grade 1). Complete resolution was achieved by day 30 and maintained through day 60, with all participants (100%) reporting no burning micturition (grade 0). These results indicate a rapid and sustained improvement in burning micturition symptoms over the course of the study period (Table 2 & Figure 2).

Table 2: Assessment of burning micturition

Grade	Burning Micturition in number of patients (%)			
	Baseline	Day 15	Day 30	Day 60
Grade 0	-	8 (80%)	10 (100%)	10 (100%)
Grade 1	2 (20%)	2 (20%)	-	-
Grade 2	8 (80%)	-	-	-

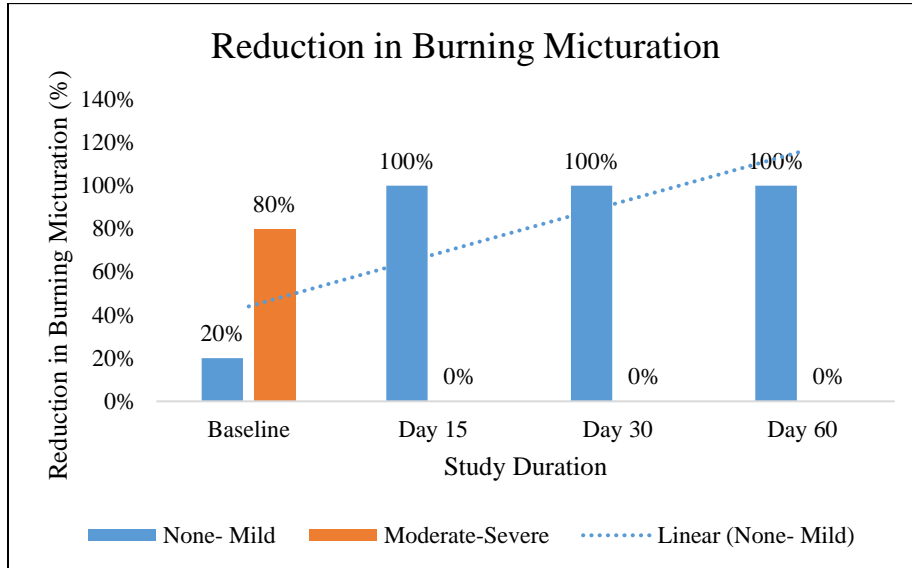


Figure 2: Reduction in Burning micturition

Effect of intervention on dysuria

Dysuria was evaluated using a grading scale ranging from 0 (no dysuria) to 3 (constant dysuria requiring treatment). At baseline, 80% of patients (n=8) experienced Grade 2 dysuria, while 10% (n=1) each reported Grade 1 and Grade 3 dysuria. By Day 15, a marked improvement was observed, with 60% (n=6) of

patients showing complete resolution (Grade 0) and 40% (n=4) reporting only occasional dysuria (Grade 1). At both Day 30 and Day 60 follow-ups, all patients (100%, n=10) achieved complete resolution of dysuria symptoms (Grade 0), indicating a substantial and sustained improvement over the course of treatment (Table 3 & Figure 3).

Table 3: Assessment of dysuria

Grade	Dysuria in number of patients (%)			
	Baseline	Day 15	Day 30	Day 60
Grade 0	-	6 (60%)	10 (100%)	10 (100%)
Grade 1	1 (10%)	4 (40%)	-	-
Grade 2	8 (80%)	-	-	-
Grade 3	1 (10%)	-	-	-

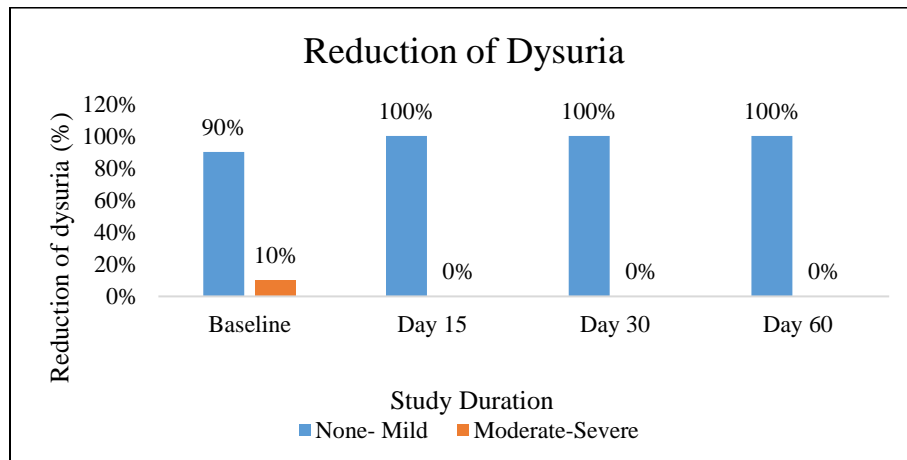


Figure 3: Reduction in dysuria

Effect of intervention on other symptoms associated with kidney stone

The case study evaluated other symptoms associated with kidney stones, including nausea, vomiting, constipation, and weakness. The 4-point Likert scale used for symptom assessment included a scale from 0 (none) to 3 (severe).

Nausea showed clinically significant improvement, with the proportion of asymptomatic participants increasing from 20% at baseline to 90% before Day 15, and 100% by Day 30, maintained through Day 60. Vomiting symptoms resolved completely before Day 15, with all subjects reporting no vomiting (score 0) compared to 50% at baseline.

Constipation demonstrated a gradual improvement trend: at baseline, 30% reported no constipation, increasing to 40% before Day 15, 70% by Day 30, and 80% by Day 60. Notably, moderate and severe constipation resolved entirely before Day 15.

Weakness symptoms also showed marked improvement, with 50% reporting no symptoms at baseline, progressing to 100% of participants experiencing either no symptoms or only mild symptoms before Day 15. Complete resolution of weakness was achieved in all participants by Day 30 and maintained through Day 60. These results collectively indicate a consistent trend of symptom amelioration across all evaluated parameters throughout the study period.

Assessment of urinalysis parameters

After 60 days of treatment the urinalysis parameters showed notable improvements. Red blood cells, initially present occasionally per hpf in all patients, were completely absent after treatment. Pus cells, which ranged from 4-5/hpf to as high as 25/hpf before treatment, substantially decreased, with many patients showing complete clearance or reduction to 2-3/hpf. Similarly, epithelial cells, initially

present in most patients (2-8/hpf), were entirely absent post-treatment.

Biochemical markers also demonstrated improvement. serum creatinine levels, which ranged from 1.0 to 2.1 mg/dL pre-treatment, decreased in all patients, with post-treatment values ranging from 0.8 to 1.5 mg/dL. Proteinuria, present in one patient before treatment, was absent afterward. Notably, casts were consistently absent in all patients both before and after treatment.

Regarding calcium oxalate crystals, present in all patients initially, were absent in 9 out of 10 patients after treatment, with one patient showing only trace amounts.

These findings suggest that the treatment administered over 60 days had a positive impact on improving renal functions, as well as overall urinalysis parameters.

DISCUSSION

This case study evaluated Gplife Healthcare's plant-based kidney detox supplement as an adjunctive therapy for kidney stone over a 60-day period. The results demonstrated promising efficacy, with a 60% complete clearance rate of calculi. Patients experienced rapid and sustained relief from multiple symptoms, including abdominal pain, burning micturition, and dysuria. Notable improvements in urinalysis parameters were also observed. Importantly, throughout the study duration, no adverse drug reactions were reported, suggesting a favorable safety profile for the supplement.

The efficacy of this supplement can be attributed to its composition of synergistic herbs, including Pashanbheda, Punarnava, Varuna, Gokhru, Celery, Pumpkin, etc. The formulation's potency is enhanced by the patented "Synergistic Optimize Blend Technology," which improves herbal synergy and enhances absorption and bioavailability. The potential mechanism of action of this herbal formulation likely involves a synergistic process, encompassing diuretic, antimicrobial,

antioxidant, anti-inflammatory, litholytic, and antilithogenic activities of its ingredients [11]. Recent reviews have elucidated additional mechanisms, such as increasing urolithiasis inhibitors by elevating urinary citrate excretion and decreasing urinary calcium and oxalate, thus reducing the risk of stone formation [12]. The antimicrobial and antioxidant properties of the herbs also contribute to their antilithogenic effect [13].

Pashanbheda, widely known as "stone breaker" in traditional medicine, has been widely studied for its role in urolithiasis management [14]. Its mechanism of action involves disrupting crystal growth and aggregation processes, effectively reducing calcium oxalate precipitation. Moreover, studies have shown that Pashanbheda can alter patients' urinary biochemistry, potentially diminishing the lithogenic tendency [15]. These findings align with our observations in the current case study.

A randomized study, demonstrated that Gokhru led to notable decreases in both the size and number of renal calculi over a 90-day period. Additionally, clinically significant reduction in pain, burning, and hematuria was observed [16].

Our results also mirror those of a comparative study on the Punarnavadi compound used to assess its impact on renal function. This combination, like our formulation, contains herbs traditionally used for urinary disorders, including Punarnava, Varuna and Gokhru. The study reported clinically significant quality of life improvements in patients treated with Punarnavadi compared to those receiving allopathic treatments, with no adverse reactions reported [17]. Another study found that pumpkin seeds reduced the occurrence of calcium-oxalate crystals and calcium levels in urine [18]. These parallels further support the potential of our plant-based kidney detox supplement as an adjunctive therapy for kidney stone.

While our study findings are promising, it's important to acknowledge the limitations of this case study. The small sample size and lack of a control group restrict the generalizability of the results. Additionally, the 60-day study duration may not be sufficient to assess long-term efficacy or potential side effects. Future research should address these limitations by conducting larger, randomized controlled trials with extended follow-up periods. Such studies would help confirm our findings and establish the supplement's role in clinical practice. Further investigation into the mechanism of action of ingredients and their potential interactions with other treatments could optimize the use of this supplement as an adjunctive therapy for kidney stone.

CONCLUSION

This case study provides preliminary evidence for the efficacy and safety of Gplife healthcare's plant-based kidney detox supplement as an adjunctive therapy for kidney stone. The observed improvements in calculi clearance, symptom relief, and urinalysis parameters, coupled with the absence of adverse reactions, warrant further investigation into this promising treatment approach.

Declaration by Authors

Acknowledgment: The authors would like to acknowledge the research team and the back-office team involved in the research work. We would like to acknowledge the support provided by back office, Gplife Healthcare Pvt. Ltd.

Source of Funding: None

Conflicts of Interest: The authors declare no potential conflicts of interest with respect to research, authorship and/or publication of this article.

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How to cite this article: Shridhar J. Pandya, Chetan H. Savaliya, Megha Lokhande, Dheeraj Nagore. Therapeutic potential of plant-based supplement as adjunctive treatment in nephrolithiasis. *Int J Health Sci Res.* 2024; 14(12):73-80. DOI: <https://doi.org/10.52403/ijhsr.20241208>
