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Research Article

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Evaluation of herbal product Neph-tone tablet for chronic kidney disorder

Sarang Palewar[1], Chetna Palewar[2], Deepika Sharma[3]

[1]Prakhar Healthcare - Managing Director, India
[2]Swayambhu adi yoga foundation - Department of Naturopathy and Yogic Science, India
[3]Prakhar Healthcare- Technical Director, India
*Corresponding author: [1]palewarsarang@gmail.com, [2]palewarchetana28@gmail.com,
[3]prakharhealthcare@gmail.com

Abstract Chronic kidney disease (CKD) is a stealthy adversary, cunningly weaving its web through various factors, often unnoticed until its effects become undeniable. Its multifactorial nature means it can stem from a plethora of origins, including diabetes, hypertension, genetic predispositions, and other underlying conditions. Managing CKD requires vigilance and a comprehensive approach, addressing not only the renal impairment but also its associated complications and underlying causes. Early detection through routine screenings, alongside lifestyle modifications and targeted interventions, can help slow its progression and mitigate its detrimental effects. In this research work, Neph-tone herbal tablet was studied on kidney patients for serum creatinine levels.

Keywords chronic kidney disorder, Neph-tone

1. Introduction

Functional disorders of the urogenital tract, including overactive bladder (OAB), interstitial cystitis/bladder pain syndrome (IC/BPS), and chronic prostatitis/chronic pelvic pain syndrome (CP/CPPS), are a collection of disorders that have yet to be fully understood in terms of its structural aspect [1-2].

Kidney stones primarily become stuck within the kidney(s). Urinary stones have been a persistent affliction for humanity for generations, with records reaching back to 4000 B.C. This condition is the most prevalent ailment affecting the urinary tract. The prevention of recurrent kidney stones continues to be a significant challenge in human health. To prevent the recurrence of stones, it is necessary to gain a more comprehensive understanding of the mechanisms that contribute to stone development. Kidney stones have been linked to a higher likelihood of developing chronic kidney illnesses, end-stage renal failure, cardiovascular disorders, diabetes, and hypertension. There is a suggestion that kidney stones could be a systemic condition associated with the metabolic syndrome. If nephrolithiasis is accompanied by nephrocalcinosis, it accounts for 2 to 3% of end-stage renal patients [3-4].

The symptoms of kidney stones are contingent upon their location, whether they reside in the kidney, ureter, or urinary bladder. At first, the creation of stones does not produce any symptoms. The subsequent manifestations of the stone disease include renal colic (severe cramping pain), flank pain (pain in the back), hematuria (blood in urine), obstructive

uropathy (urinary tract disease), urinary tract infections, urine flow blockage, and hydronephrosis (kidney dilation). These conditions may lead to nausea and vomiting, causing distress during the stone event. Consequently, the expenses incurred from treatment and the resulting absence from work have a significant financial impact on both individuals' quality of life and the overall economy of the nation.

The epidemiology of kidney stones reveals a global trend of rising prevalence and recurrence rates, accompanied by a scarcity of effective pharmaceutical interventions. Urolithiasis impacts around 12% of the global population at some point during their lifespan. It impacts individuals of all age groups, genders, and ethnicities, but it is more prevalent in men than in women between the ages of 20 and 49. Without the use of metaphylaxis, the recurrence rate of secondary stone forms is projected to be 10-23% annually, 50% within 5-10 years, and 75% within 20 years for the patient. Nevertheless, the likelihood of nephrolithiasis recurring throughout one's lifetime is greater in males, despite the fact that the occurrence of this condition is increasing among girls. Hence, it is crucial to prioritize preventive measures in order to effectively manage urolithiasis [5].

Recent research have indicated a rising occurrence of urolithiasis in both industrialized and developing countries over the past few decades. This emerging phenomenon is thought to be linked to alterations in lifestyle behaviors, including reduced physical activity and eating patterns, as well as the effects of global warming. Kidney stones impact around 1 in 11 individuals in the United States, with an estimated 600,000 Americans experiencing urinary stones annually. Approximately 12% of the Indian population is estimated to have urinary stones, and among them, 50% may experience renal function impairment [6].

The urine filtrate is generated within the glomerulus and subsequently flows into the tubules, where its volume and composition are modified through processes of reabsorption and secretion. The majority of solute reabsorption occurs in the proximal tubules, while precise modifications to urine composition occur in the distal tubule and collecting ducts. The primary function of the loop of Henle is to facilitate the process of urine concentration, which consists of 95% water, 2.5% urea, and 2.5% a combination of minerals, salts, hormones, and enzymes. Glucose, salt, chloride, and water, as well as important nutrients including amino acids, proteins, bicarbonate, calcium, phosphate, and potassium, are reabsorbed in the proximal tubules and delivered back into the bloodstream. The regulation of salt and acid-base balance in the blood occurs in the distal tubule [7].

Urinary infections caused by bacteria that produce urease, such as Proteus, Klebsiella, Pseudomonas, and Staphylococcus species, lead to the formation of infection stones composed of ammonium phosphate, struvite, and carbonate apatite. Urinary tract blockage, urinary catheters, distal renal tubular acidosis, neurogenic bladder voiding dysfunction, and medullary sponge kidney are all risk factors for the formation of infection stones. Infection-induced stones mostly form as a result of the presence of ammonia and carbon dioxide, which are generated during the hydrolysis of urea catalyzed by urease. Urine alkalinisation causes the creation of ammonium ions, which can attach to Mg^{2+} ions, resulting in the creation of struvite ($(NH_4)\ MgPO_4.6H_2O$). On the other hand, carbon dioxide can attach to Ca^{2+} ions, leading to the development of carbonate apatite ($Ca_{10}(PO_4)6CO_3$). Thus, without the presence of urease activity, the formation of struvite in urine is unattainable due to the typically low levels of ammonia concentration. Furthermore, the ammonia that is generated during the process of urea hydrolysis has the ability to harm the glycosaminoglycan layer. This layer serves as a protective barrier on the urothelial surface, guarding it against bacterial infections [8-9].

Roscoea purpurea, also known as Kakoli, is a species of flowering plant.

Roscoea purpurea, a member of the Zingiberaceae family, is usually referred to as "kakoli". Traditionally, different components such as leaves, roots, and flowers have been utilized for the management of conditions such as diabetes, hypertension, diarrhea, fever, and inflammation [10].

Roscoea purpurea Sm., a member of the Zingiberaceae family, is a valuable medicinal plant that is native to the Himalayan region. It may be found in several parts of India, ranging from Himachal Pradesh to Arunachal Pradesh. The tuberous rhizomes of the plant are utilized in traditional preparations as a tonic for reproductive weakness and various other ailments [11-12].

Crataeva nurvala, also known as Varuna, is a valuable medicinal tree belonging to the Capparaceae family. It is widely distributed throughout India, particularly in the semiarid regions. The herb is commonly used in traditional medical

systems like Ayurveda and Unani to treat recurring urinary illnesses caused by antibiotic-resistant organisms. C. nurvala has also been utilized in the management of benign prostatic hyperplasia and increased bladder irritability. The plant possesses the ability to alleviate, prevent, and facilitate the expulsion of kidney stones [13-16].

Bergenia ligulata, often known as Pasanbhend, is a plant species.

Bergenia ligulata (Wall.) Engl. has been utilized in the Indian traditional system of medicine for the management of urolithiasis. Due to its effectiveness, it has been included in many commercial herbal products including Cystone and Neeri, which are recommended for kidney-related conditions [17].

Due to the intricate and multifaceted causes of urolithiasis, the ethanolic extract from B. ligulata shows promise as a potential treatment for kidney stones. It has the ability to reduce inflammation and prevent cell death, making it a viable option for management [18-19].

Tribulus terrestris, often known as Gokshur, Gokharu, or puncture vine.

Tribulus terrestris, a member of the Zygophyllaceae family, is widely recognized as Gokshur or Gokharu or puncture vine. It has a longstanding history of use in traditional Indian and Chinese medicine for the treatment of diverse ailments. The many components of this substance consist of a diverse range of chemical elements that have significant medical value, including flavonoids, flavonol glycosides, steroidal saponins, and alkaloids. It possesses diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotonic, central nervous system, hepatoprotective, anti-inflammatory, analgesic, antispasmodic, anticancer, antibacterial, anthelmintic, larvicidal, and anticariogenic properties [20-21].

Boerhavia diffusa, also known as Punarnava, is a plant species.

Boerhaavia diffusa is a widely recognized medicinal plant that is utilized in the treatment of numerous human illnesses, as documented in Ayurveda, Charaka Samhita, and Sushrita Samhita. The entire Plant, as well as its specific parts (Aerial parts and Roots), possess a wide range of medicinal properties. They are utilized by indigenous and tribal populations in India and in Unani medicine in Arab countries. These properties include being anti-bacterial, anti-nociceptive, hepato-protective, hypo-glycemic, anti-proliferative, anti-estrogenic, anti-inflammatory, anti-convulsant, anti-stress, and anti-metastatic. Additionally, they are used in the treatment of stress, dyspepsia, abdominal pain, inflammation, and jaundice [22-24].

Dolichos biflorus linn, also known as horse gram or Kultha. Kultha, scientifically known as Dolichos biflorus Linn. / Macrotyma uniflorum (Lamk.), is a member of the Leguminosae family. It is located throughout Asia and Africa. In India, it is cultivated in the southern states of Andhra Pradesh, Maharashtra, and Karnataka. Kultha, also known as Kulattha or Kulatthika in Sanskrit, is commonly referred to as Horse gram. It functions by restoring the equilibrium of the body's doshas. Horse grain contains a rich supply of polyphenols, flavonoids, and powerful antioxidants that help maintain the strength, vitality, and youthfulness of your body. Kulttha is rich in carbohydrates and proteins, and it also contains important trace minerals like as iron, molybdenum, and calcium. These factors contribute to achieving the highest level of energy, muscle strength, regulated production of red blood cells, and strengthened bones [25-26].

D. biflorus effectively preserved the increased levels of urine and serum parameters, with a significant statistical difference ($P<0.001$). In addition, D. biflorus has a greater renoprotective index compared to cystone when administered at the same dosage levels [27-28].

Raphanus sativus, often known as Radish, is a root vegetable that is widely consumed globally. It belongs to the Brassicaceae family. Radish extracts derived from the aboveground and belowground components have been utilized in traditional medicine since ancient times to treat gastrointestinal diseases, urinary infections, liver inflammation, cardiac abnormalities, and ulcers [29-31].

Salsola koli, popularly known as Sajji Chhar, is the scientific name for a plant species. Salsola kali is a significant therapeutic plant with distinct phytochemical and biological composition that is often disregarded [32-34].

Acacia Arabica, often known as Babool, has demonstrated efficacy in treating various diseases, including diabetes, skin conditions, and notably, cancer. The fresh plant parts of Acacia arabica are regarded as having astringent, demulcent, aphrodisiac, anthelmintic, antibacterial, and antidiarrheal properties, and are also thought to have significant nutritional value in the Indian traditional medicine system [35-37]

Product Name- Neph-Tone Tablet	**Composition**

Sr. No.	Ingredient	Latin name	Part of plant	Quantity	Proof of Concept
1	Kakoli	Roscoea purpurea	Rhizome	30 mg	BPN
2	Varun	Crataeva nurvala burn	Bark	30 mg	BPN
3	Pasanbhed	Bergenia ligulate	Root	30 mg	BPN
4	Gokhuru	Tribulus terrestris	Fruit	30 mg	API I/I
5	Punarnva	Boerhavia diffusa	Root	30 mg	API I/I
6	Kulthi	Dolichos biflorus linn	Seed	30 mg	BPN
7	Muli Chhar	Raphanus sativus	Chhar	30 mg	RTS
8	Sajji Chhar	Salsola koli	Chhar	30 mg	RTS
9	Babool Gond	Acacia Arabica	Niryas	10 mg	API I/I

Renal Dysfunction:

Chronic kidney disease (CKD) is an deceptive, multifactorial, and unhurriedly progressive disease, demarcated using reformed kidney edifice or dysfunction contemporary for three months or extra.1 CKD is categorized into six stages (Stage 1, 2, 3a and 3b, 4, and 5) based on glomerular filtration rate (GFR).

Inclusion criteria

1. Patients age more than 21 years.
2. Patients have documented renal disease.
3. Systolic blood pressure >140 at two clinic visits in the past year or >160 at one visit
4. For adults: Stage 3-5 CKD (eGFR < 60 ml/min/1.73m^2)
5. Prescription for anti-hypertensive medication (in adults).

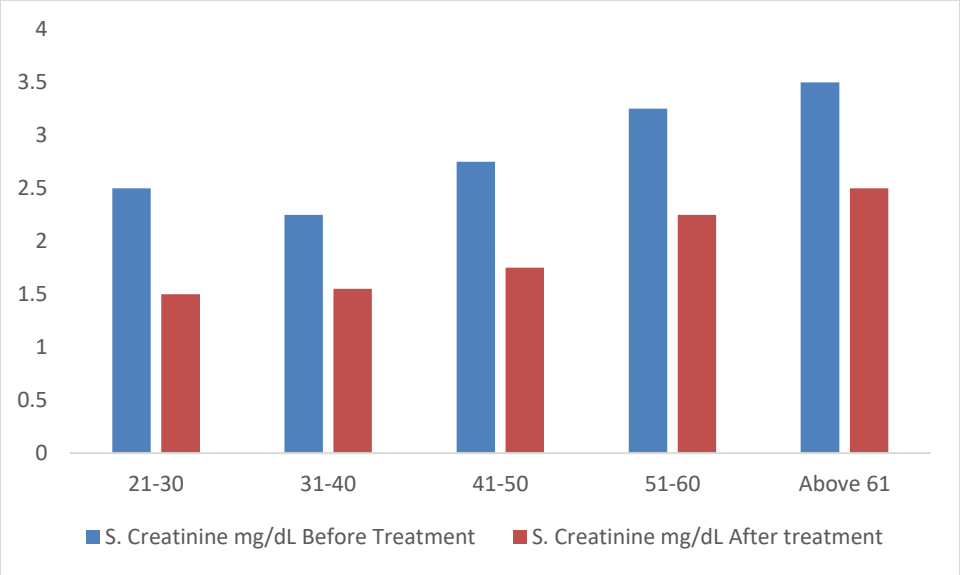
Intervention

This study enrolled 55 Patients details below:

S. No.	Age Group (Years)	No. of Subjects	S. Creatinine mg/dL (Before Treatment)	S. Creatinine mg/dL (After treatment)
1	21-30	8	2.5	1.5
2	31-40	9	2.25	1.55
3	41-50	15	2.75	1.75
4	51-60	16	3.25	2.25
7	Above 61	17	3.5	2.5
8	Total	55		

Result & Discussion

The outcomes of this take a look at display that serum urea degree improved non-extensively withinside the patients who administered the tablet Neph tone, whilst it reduced non-extensively withinside the group. This growth and reduce is a signal of alteration and will in all likelihood end result from the outcomes of the tablet administered, thereby changing the fee at which the kidney excretes urea.



Urea is the very last degradation made from protein and amino acid metabolism. It is synthesized withinside the liver from ammonia produced due to deamination of proteins.

Filtration of urea from the blood into the urine through the renal glomeruli is the major way through which extra nitrogen is removed from the body. Among the renal reasons of improved urea degrees are acute glomerulonephritis, persistent nephritis, polycystic kidney, nephrosclerosis, and tubular necrosis.

From this results, it can be observed that, on average, serum creatinine levels decrease after treatment across all age groups. This suggests that the treatment may have a positive effect on kidney function. The extent of the decrease varies with age, with larger decreases seen in older age groups. However, further analysis would be needed to confirm the significance of these changes and the effectiveness of the treatment in different age groups.

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