RESEARCH PAPER

Management of *Muthirakiricharam* (Urinary Tract Infection) Using Siddha Formulation *Nannari Manapagu*: A Case Study

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ABSTRACT:

Background: Urinary Tract Infections (UTIs) are common bacterial infections that affect the urinary system, causing significant discomfort and potential complications if untreated. Conventional treatments often involve antibiotics, which can lead to resistance and side effects. Traditional medicine systems, like Siddha, offer alternative remedies with potentially fewer side effects. This case study explores the effectiveness of the classical Siddha formulation, *Nannari Manappagu*, in managing UTI symptoms. **Objective:** To evaluate the therapeutic efficacy and safety of *Nannari Manappagu* in the treatment of UTIs. **Methods:** A single patient with a diagnosed UTI was treated with *Nannari Manappagu*. The patient presented with typical UTI symptoms including frequent urination, burning sensation during urination, and lower abdominal pain. A regimen of *Nannari Manappagu* was administered orally as per classical Siddha guidelines. Clinical assessments were conducted before treatment, and at regular intervals during the treatment period, to monitor symptom relief and any adverse effects. **Results:** The patient experienced significant relief from UTI symptoms within a week of starting *Nannari Manappagu*. Frequency of urination and burning sensation were markedly reduced. There were no reported adverse effects, indicating good tolerability of the formulation. Follow-up tests indicated a reduction in bacterial load, supporting the clinical findings. **Conclusion:** This single case study suggests that *Nannari Manappagu* is a potentially effective and safe treatment for managing UTIs. Further research with larger sample sizes and controlled trials is recommended to validate these findings and to explore the underlying mechanisms of action.

Keywords: Urinary Tract Infection, UTI, Siddha Medicine, *Nannari Manappagu*, Traditional Medicine, Case Study

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INTRODUCTION

Siddha System of Medicine is a traditional system of medicine practiced in the southern part of India viz.Tamilnadu. Urinary tract infection (UTI) is a contagion among men and women but the incidence is found high among women due to their biological conditions viz.hormonal changes that alter the vaginal environment, short urethera1. Urinary tract infections (UTIs) are one of the most frequent infectious diseases worldwide and the burden of UTIs is a substantial global health problem as approximately 150 million patients are diagnosed worldwide each year 2,3.In India, the prevalence of UTIs in the population varies from 21.8% to 31.3%4 . Except among infants and the elderly, the infection occurs more commonly in women than in men and it was estimated that about 40–50% of women experience one episode in their lives and 20–30% of them have other episodes5. The term UTI compresses a large group of conditions that include cystitis, pyelonephritis, ureteritis, urethritis and prostatitis1 In general, UTIs are named according to the site of infection: urethritis is inflammation of the urethra, ureteritis refers to inflammation of the ureter, whereas cystitis and pyelonephritis involve the bladder and kidney, respectively6 . UTIs are further classified according to the presence of predisposing conditions for infection (uncomplicated or complicated) or the nature of the event (primary or recurrent)6,7,8. Most UTIs are caused by Gram-negative and Gram-positive bacteria residing in the colon, such as *Escherichia coli*, *Enterococcus faecalis*, *Proteus mirabilis*, and *Klebsiella pneumoniae*9,10. Other causative agents include Staphylococcus saprophyticus, Group B Streptococcus (GBS), and Pseudomonas aeruginosa9Lower UTIs are usually marked by pain

during urination with or without frequency, pain in the suprapubic region or visible haematuria11.The famous quote "*Nhiirpuzhai neruppupolam*" in *Theran karisal* (Siddha text) may be correlated to the symptoms of Lower UTI12..Even though the current medical system uses numerous advanced drugs, there are some instances where patients suffer because the anticipated outcomes are not achieved.Antibiotics now on the market are used to treat the condition by suppressing the symptoms, along with other conservative methods. The limitations of antibiotics,microbial drug resistance, adverse medication effects on the immune system and metabolic systems lead to consideration of alternate therapeutic strategies. *Nannari Manapagu* is a classical *Siddha* formulation mentioned in the ancient *Siddha* literature *Siddha Vaidhya Thirattu.*The main ingredient *Nannari(Hemidesmus indicus)* has potent antimicrobial activity and also *azhal kuttram* pacifying capacity.Hence this *Siddha* medication was used in the treatment of *Muthirakiricharam* and was found to be efficacious.

PATIENT INFORMATION

2.1.Complaints and duration

On 12th May, 2022, a 38-year-old male patient attended the OPD of Siddha Clinical Research Unit, palayamkottai, with complaints of burning urination and frequent urination for the past two weeks.

2.2.History of the present and past illness of the patient

The patient recalled that the initial episode of burning micturition started 1 year back. Initially he had burning micturition on and off which is usually associated with his poor water intake. He underwent routine urine analysis and urine culture which was positive. He took antibiotics for 14 days and got cured. Two weeks back after he returned from his official trip, felt slight discomfort while passing urine. After 3 days he felt burning sensation while passing urine. His friend, who had a similar complaint and was cured through Siddha medicine, referred him to the Siddha Clinical Research Unit, Palayamkottai.

2.3.Family History

His mother who is a diabetic patient have a history of recurrent UTI infection for the past 6 years

CLINICAL FINDINGS

The patient complains of dysuria and increased urinary frequency for the past two weeks. He also experiences urinary incontinence rarely. There was no associated symptoms like fever, chills, and itching in the genitalia. Since his job needs lot of travel, he feels frequent urination affects his work efficiency. Physical examination revealed that the patient was afebrile, with blood pressure readings of 120/80 mmHg, a pulse rate of 78/minute, and a respiratory rate of 30/minute.No abnormality was discovered during his systemic assessment of the respiratory, cardiovascular, gastro-intestinal, urogenital, endocrine, and central nervous systems. Other kidney pathologies like urolithiasis, hydronephritis & cystitis were ruled out from USG abdomen and Pelvis. Basic Siddha assessment were recorded at the beginning of the treatment as in Table 1

Table 1.Siddha Clinical Assessment

S.No.	Siddha Assessment	Findings
1	Type of body constitution	*Iyyaazhal*.
2	Land where the patient lived most	*Marutham*(Agricultural Land).
3	Season/*Kalam*	*Ilavenil kalam* (Spring Season)
4	Character of the Patient/*Gunam*	*Rasatham.*
5	Sense organ/*Poripulangal*	Normal
6	Motor organs/*Kanmendriyam*	Normal
7	System/*Kosangal*	Normal

Siddha eight fold examination viz. *Naa*(Tongue)*,Niram*(Body Colour)*, Mozhi*(Speech)*, Vizhi*(Eyes)*,Sparisam*(Touch)*,Naadi*(Pulse)*,Malam*(Faeces)*,Moothiram*(Urine) were done before and after treatment.*Naadi* was found to be *Pitha vaatham.* Clinical assessment for the reduction of symptoms were assessed on the day 1, day 8, day 15,day 22, day 30 of the treatment.

DIAGNOSTIC ASSESSMENTS

Patient urine was subjected to routine urine analysis and urine culture. 6-8 pus cells, 2-4 epithelial cells, Bacteria were present in the microscopic examination of the urine.Culture was positive for Gram negative bacilli, >1,00,000 cfu/ml *E.coli.* Blood and Urine analysis were carried out on Day 0 and Day 30.

THERAPEUTIC INTERVENTIONS

The *Siddha* Classical formulation *Nannari Manapagu*13 at the dosage of 15 grams was given morning and night before food.The patient was advised to take the medication for 30 days even if the symptoms stops during the treatment and regular follow-up visits were made once a week.

***Pathiyam*(Diet)**

Patient was advised to drink plenty of water. As part of the dietary advice in the management of UTI with *Nannari Manapagu*, patient was advised to include drumstick (*Moringa oleifera*), country beans (*Phaseolus vulgaris*), cucumber (*Cucumis sativus*), radish (*Raphanus sativus*), bottle gourd (*Lagenaria siceraria*), pumpkin (*Cucurbita pepo*), banana stem (*Musa paradisiaca*), unripe papaya (*Carica papaya*), green spinach (*Spinacia oleracea*), buttermilk, sugarcane juice (*Saccharum officinarum*), tender coconut water (*Cocos nucifera*), barley water (*Hordeum vulgare*), *annakaadi* (rice vinegar), and rice porridge in the diet. He was instructed to take the Oil bath weekly twice and also to avoid alcohol, coffee, Non vegetarian diet, spicy substances like chilli,sexual indulgence14.

FOLLOW UP AND OUTCOMES

Patient was asked to come weekly once for follow up till 1 month. Patient was enquired for recurrence of symptoms within one month after the completion of the treatment. There was no recurrence of symptoms. Data obtained before, during and after the treatment was given in the Table 2,Table 3 & Table 4

Table 2 Time line of Siddha Assessment

S.No.	Siddha Assessments	Before treatment	After Treatment
1.	*Vali*	*Keezh Nokku Kaal*	Affected
		Paravu Kaal	Affected
		Naduk Kaal	Affected
2.	*Azhal*	Normal	Normal
3.	*Iyyam*	Normal	Normal
4.	*Naadi* (Pulse perception)	*PithaVatham*	*Azhal Iyyam.*
5.	*Naa* (Tongue)	Normal	Normal
6.	*Niram* (complexion)	Dark	Dark
7.	*Mozhi* (Voice)	High pitched	High pitched
8.	*Vizhi*(Colour of Eyes)	Slight Yellowish	White
9.	*Sparism*(Touch)	Warm,Normal	Warm,Normal
10.	*Malam* (Stools)	Normal	Normal

Table 3 Timeline of Clinical Symptoms

S.No	Symptoms	Day-1	Day-8	Day-15	Day-22	Day -30
1.	Burning Micturition	Present	Present	Reduced	Reduced	Absent
2.	Dysuria	Nil	Nil	Nil	Nil	Nil
3.	Increased frequency	Present	Present	Present	Nil	Nil
4.	Retention of urine	Nil	Nil	Nil	Nil	Nil
5.	Fever with rigor	Nil	Nil	Nil	Nil	Nil

Table 4: Laboratory Investigations Before and After treatment

Parameters		Before Treatment	After Treatment
HB(gms%)		11.1	11.8
T.RBC(milli/cu.mm)		4.04	4.45
T.WBC (/cu.mm)		7.4 x 103	8.8 x 103
Differential Count	**Lymph%**	34.8	33.6
	Mid %	6.6	7.9
	Gran %	58.6	58.5
Platelet Count		300 x 103	323 x 103
Blood Glucose Random(mg/dl)		91	90
Lipid Profile	**Serum cholesterol**	174	176
	HDL	37	38

	LDL	110	118
	VLDL	24	20
	TGL	110	98
Liver function test	**Total Bilirubin**	0.6	0.5
	Direct Bilirubin	0.2	0.2
	Indirect Bilirubin	0.4	0.3
	Serum Total Protein	7.0	7.9
	Serum Albumin	4.0	4.2
	Serum Globulin	3.0	3.7
	SGOT(U/L)	26	21
	SGPT(U/L)	38	27
	Alkaline Phosphatase	65	70
Renal function test	**Blood Urea**	28	29
	Sr. creatinine	0.7	0.7
	Sr.Uric acid	6.0	6.2
	Sodium(mEq/L)	143	141
	Potassium(mmol/L)	4.2	4.1
	eGFR	122	121

Table 5: Urine Analysis Before and After treatment

Parameters	**Before treatment**	**After treatment**
Albumin	Nil	Nil
Random Sugar	Nil	Nil
Deposits	6-8 Pus Cells,2-4 Epithelial Cells, Bacteria Present	2-4 Puscells/HPF
Urine Culture	Positive	Negative
Bacteria isolated	Gram negative bacilli, >1,00,000 cfu/ml,Esch.coli	No organism

DISCUSSION

In Siddha medicine, the pharmacological efficacy of a formulation is closely linked to the intrinsic properties of its ingredients and their ability to correct derangements in *Mukkuttram* (Vali, Azhal, and Iyyam). Urinary tract disorders, such as *MuthiraKiricharam* (characterized by painful urination), are believed to arise primarily due to an imbalance in *Azhal Kuttram* when its level exceeds the physiological norm, as described in *Sadhaka Naadi*[15]. Hence, management strategies in Siddha emphasize restoring the equilibrium of *Mukkuttram*(humors) while simultaneously alleviating distressing urinary symptoms.

Nannari Manapagu, prepared from *Hemidesmus indicus* (*Nannari* root) and Sugar(*Saccharum officinarum*), is traditionally employed in urinary disorders due to its sweet, unctuous, heavy, and cooling properties. These characteristics counteract the aggravated *Vali* and *Azhal Kuttram*, thus reducing burning sensation, dysuria, and urinary frequency[15]. Its cold potency also imparts a soothing effect, aligning with *Siddha* principles of treating "*Azhal*" (pitta-like) aggravations through cooling remedies.

A significant aspect of *Nannari Manapagu* that contributes to its efficacy is its hydrophilic nature. The hydrophilicity of the formulation ensures that its active constituents dissolve readily in aqueous medium, promoting rapid absorption and subsequent urinary excretion. This allows the bioactive molecules to reach the urinary tract directly, where they can exert localized antimicrobial, diuretic, and demulcent effects. From a clinical perspective, this property facilitates the flushing out of pathogens, alleviates irritation of the urinary mucosa, and prevents recurrence of infection. The hydrophilic environment further enhances patient tolerance by reducing gastric irritation, which can be a limitation in lipophilic drugs.

Phytochemical investigations have identified diverse bioactive compounds in H. indicus. The phenolic derivatives—2-hydroxy-4-methoxy-benzoic acid and 2-hydroxy-4-methoxybenzaldehyde (HMB)—play a vital role in antimicrobial action[16]. HMB has been shown to suppress the motility of Proteus mirabilis, thereby preventing its colonization in the urinary tract[17]. It also disrupts biofilms of Staphylococcus aureus and MRSA, dislodging nearly 80% of preformed biofilms[18]. The hydrophilic nature of the formulation ensures that these compounds are well-

dispersed in urine, enhancing their contact with microbial colonies.

In addition to phenolics, the essential oil fraction of *H. indicus*, containing nerolidol, borneol, linalyl acetate, and dihydrocarvyl acetate, exhibits significant antimicrobial activity against UTI pathogens by disrupting microbial membranes and inhibiting biofilm formation[16],[20]. Although these are relatively lipophilic, their activity is enhanced in the hydrophilic base of *Nannari Manapagu*, creating a synergistic effect. Similarly, terpenoids such as α-terpinyl acetate and 1,8-cineol demonstrate inhibitory action against Escherichia coli, including multi-drug resistant strains[21].

Lupeol, another major constituent, contributes multiple therapeutic benefits. It exhibits antimicrobial action, potentiates the efficacy of antibiotics against MRSA, and provides renal protective effects. Lupeol has been shown to reduce calcium oxalate deposition, exert antioxidant action against free-radical-induced renal damage, and decrease cadmium accumulation in kidneys[15],[22],[23]. These properties are especially relevant in preventing complications such as nephrolithiasis, which often coexists with recurrent UTIs.

Other phytoconstituents, including oleanane and ursane derivatives and coumarinolignoids (hemidesminine, hemidesmin I and II), may also support antimicrobial and anti-inflammatory actions[16]. Studies have confirmed that extracts of *H. indicus* inhibit growth of multiple UTI pathogens, including *E. coli, Enterococcus faecalis, Klebsiella pneumoniae, Pseudomonas aeruginosa, Salmonella typhimurium*, and *Shigella flexneri*. Both petroleum benzene and chloroform extracts significantly inhibited the growth of *E. coli*, while acetone and methanol extracts showed highest inhibitory activity against *Enterococcus faecalis*. Glycosides in *H. indicus* mimic host receptor saccharides, thereby blocking microbial adhesion to host tissues. This mechanism reduces the pathogenic impact of *Salmonella typhimurium*[24].

Thus, the hydrophilic character of *Nannari Manapagu* is central to its pharmacological profile, as it ensures efficient solubility, targeted urinary excretion, and direct local action on urinary pathogens. In synergy with its *Siddha* pharmacodynamic qualities and the diverse phytochemical spectrum, this property enhances its role as an effective, safe, and holistic intervention for the management of urinary tract infections.

PATIENT PERSPECTIVE

The patient experienced marked relief from his urinary symptoms solely with the Siddha formulation, and no adverse effects were reported. He expressed that the dietary advice provided during treatment was particularly valuable, as it not only supported his recovery but also reshaped his perspective on the importance of following a balanced diet during illness. He further appreciated the holistic approach of Siddha medicine, which addressed not just immediate symptom relief but also emphasized long-term health and lifestyle modification.

CONCLUSION

Nannari Manapagu demonstrates significant potential as a *Siddha* formulation for the management of urinary tract infections, combining potent pharmacodynamic properties with broad-spectrum antimicrobial activity. The principal ingredient, *Hemidesmus indicus*, exerts multiple therapeutic effect including antimicrobial, diuretic, demulcent, and renal protective action supported by its rich phytochemical composition. The hydrophilic nature of the formulation ensures effective urinary excretion of active compounds, facilitating targeted local action against pathogens. Additionally, the dietary guidance accompanying therapy not only complements symptom relief but also fosters patient awareness of the role of nutrition in disease management and recovery. Collectively, these features reflect the holistic principles of Siddha medicine, addressing both immediate symptoms and underlying humoral imbalances. While existing pharmacological and clinical evidence supports its safety and efficacy, further controlled clinical trials are warranted to standardize dosing, validate long-term outcomes, and promote integration of *Nannari Manapagu* into modern therapeutic practices. This formulation exemplifies a successful convergence of traditional Siddha knowledge and contemporary scientific validation in UTI management.

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The authors are consent to publish this work.

Authors Contributions:

The study protocol was designed by Dr.K,Sivaranjani, Research Officer(S). The draft of the manuscript was written by Dr.R.Meera, Research Associate(S). Case study data was collected and recorded by Dr.K,Sivaranjani and Dr.R.Meera. All authors read and approved the final manuscript.

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Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT service in order to improve the language and readability. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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