



Research Article

PRE AND POST TEST CLINICAL STUDY TO ASSESS THE COMBINED EFFECT OF *BRIHATYADI KSHEERA KASHAYA, CHANDRAPRABHAVATI AND SHWETA PARPATI* IN URINARY TRACT INFECTION

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ABSTRACT

Purpose: UTI is the broad term used to describe infection of any part of urinary tract and is a problem frequently encountered by health care providers today. E.coli is found to be the main causative agent for causing UTI (80%). The prevalence of UTI are increasing and the present standard of care includes the usage of antibiotics. The alarming and exponential use of nonspecific antibiotics, increased resistance and the high cost of prescribed medications for the management of the infective microorganisms will raise the need for alternate and safe medication. The signs and symptoms of *Mutrakruchra* and UTI are similar in nature. The combination of *Brihatyadi Ksheera Kashaya, Chandraprabhavati and Shweta Parpati* is widely practiced in *Mutrakruchra*. The present study was aimed at exploring the combined effect of the above combination in UTI.

Materials and Methods: The present study was a single group study with pre and post test study design. 20 diagnosed cases of UTI based on ICD10N39.0 diagnostic criteria and proper exclusion were selected from IPD and OPD of Amrita Ayurveda Hospital. They were administered *Brihatyadi Ksheera Kashaya, Chandraprabhavati and Shweta Parpati* for 15 days.

Result: The obtained data were analyzed statistically with symptoms of UTI, Urine analysis and urine culture by using Wilcoxon signed rank test done on the 0th and 16th day. There was significant change with 100% of improvement in clinical symptoms of UTI after treatment. Statistically significant result was obtained in reduction of WBC with p value 0.001, Epithelial cells with p value 0.005, and Nitrites, Leucocyte esterase, Bacteria with p value 0.0001. There was reduction in growth of E.coli in urine culture with statistically significant p value 0.0001. **Conclusion:** The combination of *Brihatyadi Ksheera Kashaya, Chandraprabhavati and Shwetaparpati* is effective in UTI.

INTRODUCTION

Urinary tract infection is associated with multiplication of organisms in urinary tract and is defined as the presence of >10⁵CFU/ml in the midstream sample of urine. The term UTI covers a range of conditions of varying severity from simple Urethritis and Cystitis to Acute pyelonephritis with septicaemia^[1].

In majority of UTIs bacteria establish infection by ascending from the urethra to the bladder. The most common pathway for renal parenchymal infection is the further ascent of bacteria to the kidney^[2]. Bacteria causing UTIs will colonize the colon or perianal region and periurethral region which forms a biofilm that usually resists the body's immune response^[3]. Infections of the urethra and bladder are often considered superficial or mucosal infections and the Pyelonephritis and renal suppuration signify tissue invasion. Women are particularly at risk of developing UTIs because of shorter urethra. 50 to 80% of women have at least one UTI during their life time. E.coli is found to be the main causative agent for causing UTI (80%).^[4] Urine is an excellent culture medium for bacteria and the Gold standard for diagnosis of UTI is

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urine culture. The prevalence of UTI is increasing and the present standard of care includes the usage of antibiotics which are having limitations due to increased resistance.

The signs and symptoms of *Mutrakruchra* (*Vatapittadhikya*) and UTI are similar. *Mutrakruchra* is one of the main disease among *Mutravikaras* which comes under *Mutraapravartija roga*^[5]. Ayurveda has given prime importance to *Mutravahasrotovikaras* and its management. The combination of *Brihatyadi Ksheera Kashaya*, *Chandraprabhavati* and *Shweta Parpati* is widely practiced in *Mutrakruchra*. The present study was aimed at exploring the combined effect of above combination in UTI.

METHODOLOGY

MATERIALS AND METHODS

Source of Data

The patients who attended the OPD and IPD of the Amrita Ayurveda Hospital, Vallikkavu, Karunagapally, Kerala, with signs and symptoms of UTI were screened. Among these, 20 patients who fulfilled the inclusion criteria were included in the study.

Inclusion Criteria

- Patients of either gender of age between 20 to 70 years.
- Presence of significant bacteria in urine

Treatment Schedule

Table 1: Table showing details of Therapeutic Intervention

From 1 st day to 15 th day	<p>The Following internal Medicines was given:</p> <ul style="list-style-type: none"> • <i>Brihatyadi Ksheera Kashaya</i> 50ml twice daily, before food • <i>Chandraprabhavati</i> (600mg/tab) • 2-0-2 BD (Before food) • <i>Shwetaparpati</i> (500mg) with 2 litre of water in divided dose frequently
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Assessment

Subjective parameters are painful micturition, urinary urgency, frequency, burning micturition, tiredness, nausea and back pain.

Objective parameters are WBC, epithelial cells, nitrites, leucocyte esterase, bacteria and urine culture.

Statistical Analysis

Completed 20 subjects were taken for statistical analysis. Wilcoxon signed rank test were used for statistical analysis of the collected data.

OBSERVATION AND RESULT

Out of the 20 subjects of UTI studied in the research, 75% of subjects were under the age group between 20-29 years. 95% subjects were females and 5% of the subjects were males respectively. Sixty percent of subjects were married, and 40% was unmarried. The maximum number i.e., 90% were taking mixed diet and 10% were taking vegetarian diet. The study revealed that 20% had previous history of UTI and 95.0% had Irregular appetite and 5% had regular appetite.

- Patient diagnosed with UTI as per ICD10 N39.0 diagnostic criteria

Exclusion Criteria

Diagnosed case of:

- Nephrolithiasis
- Candidiasis of urinary tract
- Pregnancy
- Renal failure
- Liver failure
- Foreign body in urinary tract
- Instrumentation of urinary tract
- Pyelonephritis
- Hydronephrosis

Study Design

It was a single group clinical study with pre and post – test study design.

Source of Medicine

Brihatyadi kashayachurna was prepared at GMP certified pharmacy of AV Oushadhashala, Thattarkonam, Kollam-5, and Kerala state -691005 *Chandraprabhāvaṭi* was purchased from the GMP certified pharmacy, Amrita life. *Shwetaparpati* was prepared in the Department of Rasasastra and Bhaishajya kalpana, Amrita school of Āyurvēda

Table 2: showing Effect of therapy on Symptoms of UTI (Change in mean number of Subjects)

S No	Variables	Mean BT	Mean AT	Percentage of Improvement
1	Painful Micturition	0.95	0.05	94.7%
2	Urinary Urgency	0.8	0	100%
3	Frequency	0.95	0	100%
4	Burning Micturition	0.7	0	100%
5	Tiredness	0.2	0	100%
6	Nausea	0.2	0	100%
7	Back pain	0.55	0	100%

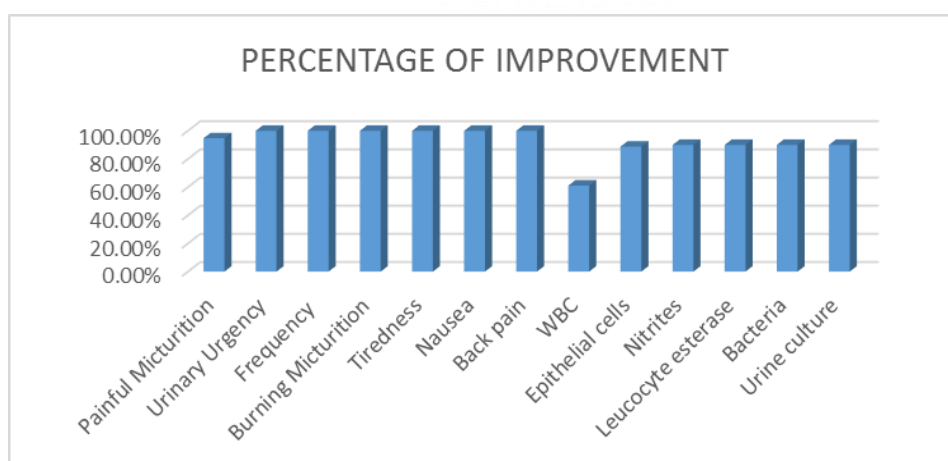
In the study after the administration of medicine, it was obtained 94.7% of improvement in painful micturition and 100% of improvement in urinary urgency, frequency, burning micturition, tiredness, nausea and back pain. It has got statistically significant result with p value 0.0001 for painful micturition, urinary urgency, frequency, burning micturition along with tiredness and nausea with p value 0.046.

Table no 3 showing Effect of therapy on urine analysis (Change in mean number of Subjects)

S No	Variables	Mean BT	Mean AT	Percentage of Improvement
1	WBC	0.9	0.35	61.1%
2	Epithelial cells	0.45	0.05	88.8%
3	Nitrites	1	0.1	90%
4	Leucocyte esterase	1	0.1	90%
5	Bacteria	1	0.1	90%
6	Urine culture	1	0.1	90%

Statistically significant result was obtained in WBC with (p value 0.001) and 61.1% improvement, epithelial cells (p value 0.005) and 88.8% improvement, nitrites with p value (0.0001) and 90% improvement, leucocyte esterase with p value (0.0001) and 90% improvement, presence of bacteria (E.coli) having p value (0.0001) with 90% improvement and urine culture with p value (0.0001) and 90% improvement.

Chart no 1 showing (percentage of improvement)



Effect of Therapy

Table no 5 Showing the Result of Wilcoxon Signed Rank Test

S. NO	Parameters	Mean Rank	Sum of Ranks	Z Value	P-value
1	Painful Micturition	9.50	171	-4.243	0.0001
2	Urinary urgency	8.50	136	-4.000	0.0001
3	Frequency	10.00	190	-4.359	0.0001
4	Burning Micturition	7.50	105	-3.742	0.0001

5	Tiredness	2.50	10	-2.000	0.046
6	Nausea	2.50	10	-2.000	0.046
7	Back pain	6.00	66	-3.317	0.001
8	Nitrites	9.50	171	-4.243	0.0001
9	Leucocyte esterase	9.50	171	-4.243	0.0001
10	WBC	6	66	-3.317	0.001
11	Epithelial cells	4.50	36	-2.828	.005
12	Presence of Bacteria in urine	9.50	171	-4.243	0.0001
13	Urine culture	9.50	171	-4.243	0.0001

DISCUSSION

In the study majority of patients were having the habit of suppressing the urge of urine and taking food untimely. It was found most of the study subjects were taking pickles, fish, and curd combined in their daily meals which will produce *Tridoṣhakopa*. With the influence of *Vata*, the *Pitta* gets localized in the *Basti* and results in burning micturition (*Dahamutrata*) and leading to *Kruchramutrata*. Most of the study subjects are having the habit of *Mutravegadharana* and usage of common toilets vitiates the *Mutravahasrotas* there by *Apanavatakopa* producing symptoms like pain over back, lower abdomen, suprapubic region and *Swalpa* or *Muhurmuhur Mutrata*. The untimely food intake leads to *Tridoṣhakopa* producing *Agnidushti* associated with *Vata* and *Pitta*.

75% of subjects were under the age group between 20-29 years. Most of them were students having the habit of suppressing the urge of urine. They used to take less amount of water and regularly used common toilet. 95% subjects were females and it can be due to the shorter urethra in females. Sixty percent of subjects were married and the Married women are associated with more chance of having UTI. It is due to sexual intercourse, Usage of spermicides, history of UTI and not maintaining proper hygiene. The maximum number i.e., 90% were taking mixed diet. Due to the usage of *Ushna*, *Teekshna Aharas* which produce *Vata Pitta kopa* result in *Mutravahasrotodushti*. In the study 95% had irregular appetite. Most of the subjects are having untimely food habits that can leads to *Agnidushti* resulting in irregular appetite. In the study 20% had previous history of UTI. This implies the recurrence of infection and it may be due to incomplete course of treatment, lack of hygiene and decreased water intake.

Among the 20 subjects enrolled for the study, majority of subjects were having the *Lakshana* of *Vata* and *Pittaja Mutrakruhra*. So due to the *Nidana*, *Vata Pitta Pradhana Tridoṣhakopa* occurs and the *Doṣhas* get localized in the *Mutravahasrotas* which is already invade by the uropathogens results in *Paripeeda* of *Mutra Marga* associated with symptoms like *Daha*, *Kruchra* or *Muhur Muhur Mutrata*.

Discussion of Subjective Parameters

In UTI the colonization of bacteria in the bladder leads to vasodilatation and leucocyte migration to the site of injury. It causes the release of inflammatory mediators like cytokines, histamines and clotting factors resulting in ulceration of bladder mucosa. This may turn to loss of bladder elasticity and subsequent pain from even mild stretching of bladder and causes painful micturition, burning sensation during urination etc. Stretch receptors in the bladder and posterior urethra subserve reflexes responsible for the urgency and frequency. The systemic release of inflammatory mediators causes back pain and tiredness^[9].

Urine flow and normal micturition are important for maintaining host defense mechanism to prevent UTI.^[10] So, *Shweta Parpaṭi* can promote diuretic action and can act as neutralizing agent. *Brihatyadi Kashaya* contains the herbs under the group of *Laghupanchamula*. Phytochemical screening of *Laghupanchamula* in a study showed the presence of flavanoid, tannin, and alkaloid which has been proved for its analgesic and anti-inflammatory activity against *E coli*.^[11,12,13] The terpenoid present in *Chandraprabhavaṭi* is studied for its ability to act against the infection caused by *E coli*.^[14] Flavanoid in *Chandraprabhavaṭi* is having antioxidant property^[15,16,17]. So the presence of these constituents can help in bringing down the inflammation caused by *E coli* and thereby relieves the symptoms of UTI like painful micturition, burning Micturition.

Discussion of Objective Parameters

The Gold standard for diagnosis of UTI is significant bacterial count $\geq 10^5$ colony forming units (CFU) of a single bacterial strain. Nitrite produced by the enzyme called Nitrite reductase that converts urinary Nitrate to Nitrite indicates the presence of Bacteria. The detection of leucocyte esterase an enzyme specific for neutrophils and the presence of Pus cells and epithelial cells indicate the inflammatory reaction in the urinary tract.

It has got significant changes in presence of bacteria, urine culture, nitrites, leucocyte esterase after

treatment. This can be due to the, Anti-inflammatory, Antibacterial action of phytochemical constituents of *Chandraprabhavati* like flavonoids, terpenoids which has been proved in an in vivo study. *Brihatyadi ksheerakashayam* includes the drugs which are under the group of *Laghupanchamoola* having the constituents like flavanoids, alkaloids tannins, and saponins etc. It possesses anti-microbial, anti-inflammatory and free radical scavenging in properties. *Shweta Parpati* can neutralize the urine there by hindering the favourable environment for growth of bacteria.

Probable Mode of Action

Brihatyadi Kashaya contain five herbal drugs includes *Brihati*, *Kantakari*, *Gokshura*, *Shalaparni* and *Prishniparni*. It can be administered in the form of *Ksheera*, *Toyapaka* and *Ghrutha* which is indicated for *Sarvamutravikara*.^[18] In the present study it was given in the form of *Ksheera Kashayam* in which *Ksheera* is having *Madhurarasa*, *Sheetaveerya*, *Mutrakruchra hara* and *Vatapittahara* property^[19]. In the *Yoga*, *Gokshura* is taken (*Dviguneekruta*) twice the quantity of all the drugs. Most of the drugs in *Brihatyadi kashaya* is having *Madhura*, *Tiktarasa*, *Seetaveerya* and *Tridoṣhahara* property. They help in reducing the *Lakshanas* like *Dahamutrata*, *Muhurmutrata* and *Kruchramutrata*.

Chandraprabhavati mentioned by *Acharya Sarangadhara* is one of the potent herbo-mineral formulation. It is having wider therapeutic application in *Bastigata* conditions like *Mutrakruchra*, *Mutraghata*, *Prameha* etc, thereby indicating its *Basti sodhana* property. Flavanoid in *Chandraprabhavati* is having antioxidant property. So the presence of these constituents can help in bringing down the inflammation produced by bacteria.

Śhwētaparpati mentioned in *Sidhaprayogasangraha* contains mainly three drugs like *Suryakshara*, *Sphatika* and *Navasagara*. It is having *Mutrala* in action and is indicated in *Mutrakruchra*.

CONCLUSION

The present study reveals that, this specific treatment protocol have shown significant reduction in Nitrites, Leucocyte esterase, Bacterial count, WBC and Epithelial cells with considerable relief in symptoms of UTI. So this study has been proved that combination of *Brihatyadi Ksheera Kashaya*, *Chandraprabhāvati* and *Śhwētaparpati* is effective in Urinary tract infection.

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REFERENCES

1. Anthony S. Fauci, MD, Dan L. Longo, MD, Joseph Loscalzo, MD, PhD, Dennis L. Kasper, MD, Stephen L. Hauser, MD, J. Larry Jameson, MD, PhD, edited, Harrison's principles of internal medicine, 19th edition, McGraw Hill Education, eBook conversion by code Mantra, Version 1.0, ISBN: 978-0-07-180215-4, MHID: 0-07-180215-0, pg no.861.
2. Anthony S. Fauci, MD, Dan L. Longo, MD, Joseph Loscalzo, MD, PhD, Dennis L. Kasper, MD, Stephen L. Hauser, MD, J. Larry Jameson, MD, PhD, edited, Harrison's principles of internal medicine, 19th edition, McGraw Hill Education, eBook conversion by code Mantra, Version 1.0, ISBN: 978-0-07-180215-4, MHID: 0-07-180215-0, pg no.862
3. Y.P Munjal (ed). API Textbook of Medicine, New Delhi: Jaypee Brothers Medical Publishers (P) Ltd, 9th edition, pg no1316
4. Soman N. Abraham and Yuxuan Miao, The nature of immune responses to urinary tract infections, Nat Rev Immunol. 2015 October; 15(10): 655-663. doi:10.1038/nri3887.
5. Hari Sadashiva Sastri Paradakara, Vagbhatta's Ashtanga Hridaya with Sarvangha sundharavyakhya of Sri Arunadatta and Āyurvēda Rasāyana Tikka by Hemadri, Choukambha Orientalia, reprint edition 2015 chikitsa Sthana, sloka number 35, pg no 675
6. Hari Sadashiva Sastri Paradakara, Vagbhatta's Ashtanga Hridaya with Sarvangha sundharavyakhya of Sri Arunadatta and Āyurvēda Rasāyana Tikka by Hemadri, Choukambha Orientalia, reprint edition 2015 Sutra Sthana sloka number 25-27, pg no 69-70
7. Sarangadhara Samhita translated in English by Āyurvēda vidwan Prof K.R srikanthamurthy. Choukambha Orientalia madhyamakhandā 7th chapter, 40-49 sloka, pg no106.
8. Sidha prayogasangraha by Yadavji Trikamji. published by vaidyanath Āyurvēda Bhavan, pg no 350-351.
9. Sonal Grover et al, Role of inflammation in bladder function and interstitial cystitis, Therapeutic advances in Urology, DOI: 10.1177
10. Clarks Professor Parveen Kumar, Dr Michael Clark, Kumar and Clarks clinical medicine 7th edition, chapter 11, pg no 602
11. Shivani Ghildiyal et al, Anti-inflammatory activity of two classical formulations of Laghupanchamula in rats, Journal of Ayurvedic and Herbal Medicine January- March 2013.
12. N.Tamizh selvametal, Antimicrobial activity of Aragwada, Rasonadi and Gokshura on isolated urinary tract pathogens, Aryavaidyan, May -july 2008
13. Dr. Ajith. A, et al, Invitro study of Gokshura and Varuna against E.coli by urine culture and

- sensitivity wsr to pittaja mutrakruchra. IAMJ: Volume 4; Issue 07; July- 2016.
14. Suneeva S Christa, et al, Modulatory Effect of Chandraprabha Vati on Antimicrobial Peptides and Inflammatory Markers in Kidneys of Mice With Urinary Tract Infection, IJKD 2013; 7: 390
 15. Weerasekera K. R. et al, Evaluation of the Effect of Ayurvedic Herbo-mineral Formulation: Chandraprabha vati on Albuminuria, American Journal of Clinical and Experimental Medicine 6 Published online December 1, 2015
 16. N. Thamizh Selvametal, A comparative study on Antimicrobial activity of various fractions of Chandraprabhagutika and triphalachurnam on Urinary tract pathogens, J.D.R.A.S. Vol. XXVIII, No. 1-2, (2007) pp.31-42.
 17. Weerasekera K.R. et al, Establishment quality and purity of "Chandraprabhavati" using sensory characteristics, physiochemical parameters, qualitative screening and TLC fingerprinting, International Journal of Herbal Medicine 2014; 2 (3): 26-29.
 18. Hari Sadashiva Sastri Paradakara, Vagbhatta's Ashtanga Hridaya with Sarvangha sundharavyakhya of Sri Arunadatta and Āyurvēda Rasāyana Tikka by Hemadri, Choukambha Orientalia, reprint edition 2015 chikitsa Sthana sloka number 1-15, pg no 673-674
 19. Hari Sadashiva Sastri Paradakara, Vagbhatta's shtanga Hridaya with Sarvanghasundharavyakhya of Sri Arunadatta and Āyurvēda Rasāyana Tikka by Hemadri, Choukambha Orientalia, reprint edition 2015 Sutra Sthana sloka number 25-27, pg no 69-70

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