

Role of Ayurveda in *Mutrakrucchra* w.s.r. to Urinary Tract Infection- A Review Study

Shraddha V. Wake^{1*} and Vaishali Kuchewar²

*^{1,2} Kayachikitsa, MGAC & RC Salod(H), Wardha, Maharashtra, India

Abstract

Discomfort in passing the urine is the cardinal feature of *Mutrakrucchra* which is commonly seen in the cases of urinary tract infection. It is one of the most common bacterial infections seen in primary care; it is rapidly responsive to modern antibiotic therapy, but still the recurrence remains. Incidence of UTI is higher in women than men, 50–80% of women in the general population acquire at least one UTI during their lifetime. The study was conducted to explore the research in *Ayurveda* related to *mutrakrucchra* (Dysuria). Different *Ayurveda* texts as well as research studies are reviewed for this purpose.

In the review, it is found that many single & combination medicines are described in various *samhita* but the research work is very less. Large numbers of studies are found on *Gokshur* (*Tribulus terrestris*) other studies are on combination medicine. All studies showed potent antibacterial as well as anti-inflammatory and diuretic properties which are beneficial in the management of *mutrakrucchra*. No study revealed any significant side effects.

From this review, it can be concluded that *Ayurveda* can be a better treatment modality for *Mutrakrucchra*. Very less research work is done on it so there is huge scope to search the potency of multiple common drugs described in *Ayurvedic* text related to *mutrakrucchra*.

Keywords

Mutrakrucchra, Urinary Tract Infection, Anti-inflammatory, Antimicrobial, Diuretic



Greentree Group

Received 19/07/16 Accepted 03/08/16 Published 10/09/16

INTRODUCTION

Urinary tract infection (UTI) is one of the most common infections encountered and treated worldwide. Despite the widespread availability of antibiotics, urinary tract infection (UTI) remains the most common bacterial infection in the human population. It is rapidly responsive to modern antibiotic therapy, but still the recurrence remains. It is more frequent in women than men. 50–80% of women in the general population acquire at least one UTI during their lifetime¹. Urinary tract infection is an infection of any part of urinary system i.e. kidneys, bladder and urethra. The cardinal features of it are fever, dysuria, urinary urgency and cloudy or malodorous urine².

There is no direct correlation of UTI in *Ayurveda* but based on symptoms, it has been correlated with *Mutrakrucchra*³. *Acharya Charak* has mentioned it in *Chikitsasthana*, *Trimarmiyaadhyay*. It denotes discomfort (*Kricchrata*) in urination. Multiple herbs are described in *Aurvedic* text that acts on *mutravahastrotas* (urinary tract). Some of these are *Trunpanchmul*, *Gokshur*, *Punarnava*, *Ringani*, *Palashpushpa*, *Shilajatu*, *Trivanga*, *Guggul*, *Chandan*, *Kamal*, *Vala*, *Nagarmotha*, *Parpatak*, *Praval*, *Mauktik*,

Kamdudha. Some multidrug formulations like *Gokshuradiguggul*, *Chandraprabhavati*, *Chandanadichurna*, *Triphalaguggul*, *Trunpanchmulquath*, *Punarnvasav*, *Chandanavasav* and *Usheerasavare* also mentioned⁴. Some *Ganalike* *Vidarigandhadigana*, *kushkashnaldarbhadi*, *trunpanchmul*, *utpaladigana*, *kakolyadigana*, *nyagrodadhigana*, *sursadigana*, *ushkadigana* and *varunadigana* are described in *Sushrutsamhita* related to *mutravahastrotas* (urinary tract)⁵.

AIM

The study was conducted to explore the research on *Mutrakrucchra* in *Ayurveda*

OBJECTIVES

To search the herbs described in *Ayurvedic* texts which act on *mutrakrucchra*

To search original articles on *mutrakrucchra* with reference to UTI

MATERIALS

Data sources: Classical *Ayurveda* texts as well as Research articles were searched through Pubmed, Medline.

OBSERVATION AND DISCUSSION

These studies are found on following drugs related to *Mutrakruccha*.

Gokshura(*Tribulusterrestris*)

In *Ayurvedic* literature, *Gokshura* (*Tribulusterrestris*) is described as *Ashmarighna* (lithotryptic), *Mehanashak* (acts on Diabetes mellitus) & *Vrushya* (Aphrodisiac). It is *shitaviryatmaka* (cold potency) and known as potent *Rasayana* (Rejuvenator) of *Mutravahasrotasa* (urinary tract)⁶. In the experimental study of Rajshree D. Shelke et al, Total 30 patients of UTI were taken. The pus cells were significantly reduced in thirty days treatment with decoction of *Gokshura*⁷. In another clinical study, it is found to be more effective due to its diuretic action⁸. In the study of Mandip R G, *Karanjadi Kvatha* provided significant relief in signs and symptoms as well complete remission in 43% patients and prevented the recurrence in 33.3% patients of UTI. Addition of *Guduchi* and *Gokshura Rasayana* to the *Karanjadi Kvatha* enhanced the quantum of the relief to 70% patients and prevented the recurrence of the disease in all the cure patients. *Karanjadi kvatha* contains

Karanja (*Pongamia glabra*), *Kiratatikta* (*Swertiachirayita*), *Manjishtha* (*Rubiaccordifolia*), *Sariva* (*Hemidesmus indicus*), *Kutaja* (*Holarrhena antidysenterica*), *Guduchi* (*Tinosporacordifolia*) and *Gokshura* (*Tribulusterrestris*) are *rasayanadrugs* of *Mutravahasrotasa* (urinary tract)⁹. In clinical study of Deshmukhe et al, The compound preparation of *Gokshura* [*Tribulusterrestris*] and *Shatavari* [*Asparagus racemosus*] was found to be effective in *Pittaj Mutrakruccha* without any complication¹⁰.

Punarnva(*Boerhaviadiffusa*)

It is described as *Mutral* (Diuretic) and *shothaghna* (anti-inflammatory)¹¹. In animal study, antibacterial activity was found, especially in inhibition of UTI causing bacteria like *proteus*, *klesbsiella*, *Pseudomonas*, *E. coli* and *Enterococcus* when compared to gentamycin¹².

Pashanbheda(*Coleus aromaticus*)

In *ayurvedic* text, it is described as *Ashmaribhedak* (Lithotryptic) & *Mutral* (Diuretic). It is *sheetviryatmak* (cold potency) drug¹³. In experimental study, it was tested against many multi drug resistant gram positive and gram negative bacteria causing UTI, It was found effective in inhibition of

both types of bacteria effectively but maximum zone of inhibition was found in gram negative bacteria¹⁴.

Haritaki(Terminaliachebula)

It is described as *shothaghna*(Anti-inflammatory), *Ashmaribhedak*(Lithotryptic)and*Mutral*(Diuretic)¹⁵.In experimental study, theethanolic and acetoneextract of fruit of *Terminaliachebula*was studied for inhibition of *P.vulgaris*, one of the antibiotic resistant and causative organisms reported for UTI. Both extracts exhibited good antimicrobial activity against UTI associated with *P. vulgaris*¹⁶.Another study revealed antibacterial activity of extract of*TerminaliaChebula* fruit against *E. coli*, *P.aeruginosa*, *Shigella**flexineria* and *S. aureus*¹⁷.

Haridra (Curcuma longa)

It is described as *kushthaghna*(acts on Dermatological disorders), *vishaghna*(Anti-toxin) and*kandughna*(Anti-pruritic)¹⁸.In experimental study, ionic, oil, resins and ethanolic fractions of turmeric were checked against both gram positiveand gram negative Urinary Tract Infection isolates. Sixty-five bacterial strains were isolated from urine of patients suffering from UTI and identified by conventional methods. 80% of total

isolated organisms were found to be gram negative while 20% were gram positive. Ionic, resin and ethanolic fractions of turmeric were found to possessed antibacterial activity against Gram positive organisms like *S. saprophyticus*, *S. aureus*, *S.epidermidis*, *S. pyogenes*, *E.faecalis* and *B. subtitis*while oil fraction had no activity against the same organisms. No activity of any of the four fractions was found against gram negative isolates.Turmeric is 100% effective against all tested gram positive organism, which are resistant to most of broad spectrum antibiotic used¹⁹.

Abdhiphala (Barringtoniaacutangula)

It is described as*Mutral*(Diuretic), *Vedanasthapan*(pain reliever), *Kushtaghna*(acts on Dermatological disorders), *Jwaraghna*(Antipyretic) and *Madhumehanashak*(Antidiabetic)²⁰.The study bySahoo S. et al was conducted to determine the antibacterial activity of *B. acutangula*against selected urinary tract pathogens by disc diffusion assay.All extracts of *B. acutangula* at 1000 µg/disc showed optimum activity against all tested UTI pathogens.Ethanolic extract showed highest activity followed by chloroform, petroleum ether and aqueous extracts against the UTI pathogens under test²¹.

Madhumalati(Quisqualisindica)

This plant is indigenous in Africa & Indian subcontinent & cultivated all over India²². In study of Kumar L. et al, it was found that methanolic extract of *Quisqualisindica* was the most effective as the widest inhibitory zone was observed as compared to the ethanolic as well as aqueous extract. It is inferred from the present investigation that demonstration of antibacterial activity of the studied flower extracts against both gram-positive and gram-negative bacteria may be indicative of the presence of broad-spectrum antibacterial compounds, suggests that there is a scientific base for its utilization as antibacterial agents in designing and developing new drugs²³.

Neel Kamal(Nymphaeanouchali)

It is *Sheetviryatmak* (cold potency) drug²⁴. The experimental study was conducted to explore antibacterial activity against multiple microorganisms which includes *Staphylococcus aureus*, *Escherichia coli*, *Proteus vulgaris* which are responsible for UTI. Extracts of ethyl acetate, methanol, chloroform and acetone showed activity against *Staphylococcus aureus*, *Escherichia coli*, and *Proteus*

vulgaris thus indicating a wide spectrum of antibacterial activity²⁵.

Multidrug formulations

ChandraprabhaVati-This animal study was conducted to explore the efficacy of the aqueous extract of *ChandraprabhaVati* as an alternative medication for the synthetic analogues administered for UTI. Supplementation of *ChandraprabhaVati* significantly restored the increased levels of the antimicrobial proteins, THP which prevents infection due to E coli²⁶.

Cystone Syrup-In the clinical study of Rathkal CS et al, A Syrup containing *Tribulusterrestris*, *Boerhaaviadiffusa*, *Saxifragaligulata*, *Cyperusrotundus*, *Asparagus racemosus*, *Dolichosbiflorus*, *Vetiveriazizanioides*, *Curcuma zedoaria*, and *Trikatu*; and powders of *Suvarchika*, *Narasara*, *Yuvakshara*, and *Saindhava* was given in the patients of chronic urinary tract infection. Present study observed a highly significant reduction in the symptoms of urinary tract infection, Out of the 46 patients of urine culture positive, 44 had sterile urine at the end of treatment with no adverse effects²⁷.

CONCLUSION

In the literary search, large numbers of herbs are described in the management of *Mutrakucchra*. But very less research work is found in this regard. In the searched studies, most of the studies are on *Gokshur* (*Tribulusterrestris*) and found to be effective in UTI. So there is huge scope of research to assess the efficacy of the drugs described in *Ayurvedic* literature on *Mutrakucchra* with reference to drug resistant urinary tract infection.

REFERENCES

1. Longo, Fauci, Kasper, Hauser, Jameson
Harrisons Principle of Internal Medicine 18th
Edition volume I Pg. 288.
2. K George. Mathew Prep. Manual for
Undergraduates, 3rd edition reprinted 2009
ISBN: 978-81-312-1154-0 pg. 636
3. Hegde G. Bhat P. Concept of lower
Urinary Tract Infection in Ayurveda. IAMJ
2014;2(4):555-59
4. Shukla Acharya Vidyadhar, Dutta R.T.
Charakasamhita of Agnivesha forwarded by
Sharma P. V., Vol II Reprint 2010
, Chaukhamba Sanskrit Pratishthan Delhi. Pg.
no.629-636
5. Sharma AR. Susruta Samhita, volume III
(Uttartantra).
Choukhamba Surbharati Prakashan, Varanasi.
Reprint 2012 pg.481- 485.
6. Sharma P.V. Dravya Gunavigyan Volume
II, Chaukhamba Bharti Academy,
Varanasi, Reprint 1999, pg.632-634.
7. Rajshree D. Shelke, Ashok D. Ramteke,
Rajani A. Patankar. Phytochemical Study of
Gokshur (Tribulus Terrestris Linn.) and
Evaluation of Its Antibacterial Activity with
Special Reference to Mutrakruichha. Int. J.
Ayur. Pharma Research, 2014; 2(3): 63-68
ISSN: 2322 – 0910
8. Sharma Gajendra Kumar. Clinical
evaluation of Gokshur species In
Mutrakruichhra (Dysuria) Abb10|Volume
1|Issue 1|2015
9. Mandip R.G. Role of karnjadikvatha and
gudichi-gokshurarasayana in management
and prevention of recurrence of
doshajamuttrakruichhra (lower urinary tract
infections). Journal of Ayurveda Physicians
& Surgeons (JAPS)
10. Deshmukhe Parag Narayan,
Ukey Rashtrapal N., Patil Swapnil Sabgonda ,
Sawai Rajesh Efficacy of gokshura(
Tribulus terrestris) and shatavari (Asparagus
racemosus) in pittajmutrakruichhra.
International journal of ayurveda &
alternative medicine vol. 2 issue 4 (2014)
11. Deshpande A.P., Javlgekar R.R.,
Ranade S. Dravya Gunavigyan Volume
II, 2009, pg.727-729.
12. Vineeth T, Deepak M. Shree R.
Antibacterial effect of Boerhavia diffusa and
Punarnavasavam on urinary tract infection
causing pathogens. World journal of
pharmaceutical research, 2014; 3(5):423-
437.
13. Deshpande A.P., Javlgekar R.R.,
Ranade S. Dravya Gunavigyan Volume
II, 2009, pg.952.

14. Subramanyian G, Padikasan I. A. In vitro antioxidant, Antibacterial Activity of C. aromaticus Essential oil against Multidrug resistant [MDR] Urinary Tract Pathogens, IJPPR 2014-15; 6(4):996-1001
15. Deshpande A.P., Javlgekar R.R., Ranade S. Dravya Gunavigyan Volume II, 2005, p.452-457.
16. Tariq A and Reyaz A.L. Terminalia Chebula: A Treatment Against Pathogenic Proteus Vulgaris Strains Associated with UTI. Int J. Res. Ayurveda Pharma 2013 4(4):560-563
17. Chattopadhyay RR, Bhattacharya SK, Anwesa B, Premanand B, Nitish Kumar P. Evaluation of antibacterial properties Chebulicmyrobalm (fruit of Terminalia chebula Retz) extract against methicillin resistant Staphylococcus aureus and trimethoprim sulphamethaxole. Resistant Uropathogenic E. coli. African journal of plant science 2009 3(2):25-29
18. Deshpande A.P., Javlgekar R.R., Ranade S. Dravya Gunavigyan Volume II, 2009, pg.791
19. Nadia Gul, Talat Y. Mujahid, Nayyar Jehan and Samia Ahmad. Studies on the Antibacterial Effect of Different Fractions of Curcuma longa Against Urinary Tract Infection Isolates Pakistan Journal of Biological Sciences, 7(12):2055-2060, ISSN 1028-8880, 2004.)
20. Deshpande A.P., Javlgekar R.R., Ranade S. Dravya Gunavigyan Volume II, 2009, pg.959-961
21. Sahoo S, Panda P. K, Mishra S.R, Parida R.K, Ellaiah P, Dash S.K. Antibacterial Activity of Barringtonia acutangula against Selected Urinary Tract Pathogens. Indian J Pharm Sci. 2008 Sep-Oct; 70(5): 677–679 PMID: PMC3038303
22. Kirtikar KR., Basu B. Indian Medicinal plants, edited by Prashant Gahlot at Valley Offset Publishers, 2006; 2 pp 1037
23. Kumar M, Gitika, Sharma A. In vitro antibacterial activity of flower extracts of Quisqualis indica Lin. against gram positive and gram negative bacteria IJAPBC – Vol. 3(3), July - Sep, 2014
24. Deshpande A.P., Javlgekar R.R., Ranade S. Dravya Gunavigyan Volume II, 2009, pg.847
25. Punjabi Y, Khilnani V, Damle P. Antibacterial activity of flower extracts of Nymphaea ochalei, Pharmacophore 2014, Vol. 5 (2), 352-357
26. Christa SS, Modulatory effect of Chandraprabha Vati on antimicrobial peptides and inflammatory markers in

kidneys of mice with urinary tract infection. Iran J Kidney Dis.2013 Sep;7(5):390-8.

27. Rathkal CS, Patki PS. Efficacy and Safety of Cystone Syrup in Chronic Urinary Tract Infection: A Double-blind, Randomized, Placebo-controlled Study Med Update. 2010; 18(7)Probe Vol. LI No. 3 Apr–Jun 2012