

# Critical study of *Haritakyadi Yoga* in *Mutrakricchra* (Urinary Tract Infection) - A Review

## Review Article

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### Abstract

Urinary tract infections (UTI), the second most common type of infection. It is one of the most serious health problem affecting millions of people each year. UTI have been considered a risk factor for the development of end stage renal diseases in children. It is of greatest concern as recurrent infection of UTI can threat to the normal course of growth and development of children. The term *Mutrakricchra* comes under the disorders of *Mutravaha Srotas*. 'Dukhen mutra pravritti' (Difficulty while micturition-disurea) is cardinal symptom of *Mutrakricchra vyadhi*. Due to *nidana sevana*, *doshas* gets vitiated by their own causes and they enters in *basti* (Urinary bladder) and produce *srotorodha*, *sankocha* and *kshobha* at *mutra marg* which further causes *Basti pradesh shotha* and produce pain and difficulty while passing urine. *Ayurveda* has significant remedy in the management of *Mutrakricchra*. *Haritakyadi yoga* is one of the *Ayurvedic* formulation used in treatment of *Mutrakricchra* by means of *Shamana chikitsa*. Conclusion: Effect of '*Haritakyadi Yoga*' was seems to be significant in reducing symptoms of *Mutrakricchra* as well as decreases possibility of drug resistance and recurrence of UTI.

**Key Words:** *Mutrakricchra*, *Haritakyadi Yoga*, Urinary Tract Infection (UTI), Antimicrobial.

### Introduction

*Ayurveda* is an ancient Indian medical system that covers a natural and holistic approach to physical and mental health. *Mutra* which is chief *drava mala* which eliminate excess of *kleda* from the human body (1). In *Mutrakricchra*, the vitiated *Pitta dosha* along with *Vata* (mainly *Apana vayu*) on reaching *Basti* (Urinary bladder) afflicts the *Mutravaha Srotas* due to which the patient feels difficulty in micturition along with symptoms like *peeta mutrata* (Yellowish urine), *sarakt mutrata* (Hematuria), *sadaha mutrata* (Burning micturition), *saruja mutrata* (Painful micturition) and *muhur-muhur mutrata* (Frequent micturition).

Urinary Tract Infection is one of the most common and potentially serious bacterial infections found globally in childhood. UTI is currently defined as the inflammatory response of the uro-epithelium to bacterial invasion. The diagnosis of UTI often missed in infants and young children since symptoms are nonspecific (2).

*Haritakyadi yoga* is a formulation explained in many *ayurvedic* text such as *Sharangdhara Samhita* (3),

*Bhaisajya Ratnavali* (4), *Chakradatta* (5) and *Yogaratanakara* (6). This formulation comprises of drugs like *Haritaki* (*Terminalia chebula* Retz.), *Gokshura* (*Tribulus terrestris* Linn.), *Pashanbheda* (*Bergenia lingulate* Wall.), *Dhanvayasa* (*Fagonia cretica* Linn.), *Aragvadha* (*Cassia fistula* Linn.). *Haritakyadi Yoga* contents shows significant antimicrobial activity against bacteria causing Urinary Tract Infection.

*Haritakyadi Yoga* is polyherbal formulation used in treatment of *Mutrakricchra* (Urinary Tract Infection) as mentioned in the *Ayurvedic* literature. Therefore the aim of present study is to evaluate the efficacy of *Haritakyadi Yoga* in *Mutrakricchra* (Urinary Tract Infection) and can prove a good alternative to existing other modern drug which is used in UTI.

The Objective of the study consist there is need of an effective and safe formulation for treatment of Urinary Tract Infection. Non judicious use of antibiotics in turn results in the recurrence of Urinary Tract Infection and develop drug resistance. The disease potential to cause kidney damage and also it may hamper normal growth and development of children. Thus in the present study, *Mutrakricchra* (Urinary Tract Infection) was taken as the subject of intervention with drug '*Haritakyadi Yoga*'.

### Material and methods

The literary review was conducted with help of several *Ayurvedic Samhitas*, Modern text books, Research papers and Journals to collect information.

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### Classical Review

**Nidana (Etiology)** – Two types of *Mutrakricchra nidana* are described in *Charaka Samhita*:

- 1) *Samanya Nidana* – described in *Vimanasthana* (7)
- 2) *Visishtha Nidana* – described in *Chikitsasthana* (8)

#### **Samanya Nidana (7):**

- *Mutruto udak-bhakshya-strisevan* (Drinking water, taking food and having sex in the presence of urge for urination)
- *Mutra vega nigravana* (Habit of holding the urge of voiding urine as a regular practice)
- *Kshina* (Body getting emaciated or tissue depletion)
- *Abhikshata* (Injury or damage to the passages carrying urine)

#### **Visishtha Nidana (8)**

**A) Vata Prakopaka nidana** - *Ativyayama* (Excessive exercise), *Yana gamana* (Overuse of riding on vehicles), *Ruksha anna sevana* (Dry meal).

**B) Pitta Prakopaka nidana** - *Tikshna aushada sevana* (Taking strong medicine), *Madya sevana* (Excessive intake of alcohol).

**C) Kapha Prakopaka nidana** - *Adhyashana* (Over indulgence of food), *Ajirna* (Indigestion), *Anupa matsya sevan*. (Intake of the meat of animals inhabiting marshy land and fish in excess).

#### **Purvarupa (Prodermal Symptoms)**

*Acharya Chakrapani* comment, says that *lakshana* of the *vyadhi* which are expressed in milder or incomplete form are to be considered as *poorvarooopa* of *Mutrakricchra*.

#### **Rupa (Symptoms) (7)**

The *Pratyatma lakshana* or symptom of *Mutrakricchra* is *saruja mutra pravrutti* (Painful micturition) and *sadaha mutra pravrutti* (Burning micturition).

1. *Atisrushta mutrata*: Voiding of too much of urine.
2. *Vibaddha mutrata*: The complete suppression of urine, Dribbling micturition (drop by drop urine).
3. *Alpa, Abhishna, Bahala, Sashula mutrata*: Impairment of the composition and quantity of urine and occasionally or frequently passing of thick urine and associated with pain.

#### **Types of Mutrakricchra**

Most of the *acharayas* considered *Mutrakricchra* is of 8 type depending on *dosha* and *nidana*. In *Charaka Samhita* (8) *Mutrakricchra* classifies into 8 type: *Vataja, Pittaja, Kaphaja, Sannipataja, Raktaja, Shukraja, Ashmarija, Sharkaraja*.

In *Sushruta Samhita* (9), *Shalyaabhighataja* and *Pureeshaja Mutrakricchra* described in place of *Raktaja* and *Shukraja mutrakricchra*.

#### **Samprapti Ghataka (10)**

1	<i>Dosha</i>	<i>Tridosha</i> , predominantly <i>Vata dosha</i> ( <i>Apana, Vyana, Samana vayu</i> ), <i>Pitta dosha</i> ( <i>Pachaka pitta</i> ).
2	<i>Dushya</i>	<i>Mutra</i>
3	<i>Agni</i>	<i>Jatharagni</i> and <i>Dhatvagni</i>
4	<i>Strotas</i>	<i>Mutravaha</i>
5	<i>Strotodushhti prakara</i>	<i>Sanga</i>
6	<i>Udbhavasthana</i>	<i>Koshta</i> ( <i>Pakvashaya</i> ) / <i>Basti Pradesha</i>
7	<i>Adhishthana</i>	<i>Basti</i> (Urinary bladder), <i>mutra marga</i>
8	<i>Rogamarga</i>	<i>Madhyam</i> ( <i>Marma-Asthi-Sandhi</i> )
9	<i>Vyadhi prakara</i>	<i>Nija</i>
10	<i>Sadhyasadh yatva</i>	<i>Kricchra-sadhyata</i>

#### **Chikitsa (Management) (8)**

*Ayurvedic* management of *Mutrakricchra* includes appropriate *Panchakarma* therapies and various *yoga* (herbal formulations) have been described as per the *dosha* predominance.

#### **Chikitsa Upkrama**

1. *Nidana Parivarjana*
2. *Swedana* (fomentation)
3. *Avagahana* (tub-bath)
4. *Abhyanga* (massage)
5. *Abhyantara Snehapana*: *Avapidaka snehapana* is one of treatment of *Mutrakricchra vyadhi*. That means drinking of pure ghee is large dose before taking the food and after digestion of food are indicated.
  - *Vataja Mutrakricchra* – *Sthiradi gana* (*Laghu Panchmoola*) *siddha ghrita*.
  - *Pittaja Mutrakricchra* – *Draksha, Vidari, Ikshu gana* *siddha ghrita*.
  - *Kaphaja Mutrakricchra* – *Takra, Tikta aushdha gana* *siddha ghrita*.
6. *Shodhana* therapy: *Abhyanga, Virechana, Vamana* and *Basti* (*Sneha, Niruha* and *Uttarbasti*) according to *doshaja Mutrakricchra*,

#### **Probable mode of action of 'Haritakyadi Yoga'**

The antipyretic effect can be explained on the basis of *Aragvadha* coated in *Bhavaprakasa* (11) coated as '*Jware tu satat pathyam Koshtashuddikaram param*' i.e, help to excrete *dushita mala* and relieves *strotorodha* as breaking *samprapti* of *jwara vyadhi*. *Haritaki* used for stimulation of bowels to relieve constipation. *Aragvadha* emulsifies the colonic contents and increases penetration of water into faeces by reducing risk factor like constipation and indirectly help in *Mutrakricchra*. In UTI, pain during micturition mainly associated with renal stones. *Acharya Charaka* has mentioned *Gokshura* as *Mutrakricchra-Anilharanam Agrya* (excellent drug in dysuria and alleviation of *Vata dosha*) (12) and included in *Mutravirechaniya mahakashaya* (13) along with *Pashanbheda*. so reduce the complaint of pain and increased frequency of micturition act as anti-urolithic

and diuretic. *Gokshura* and *Pashanbheda* has potent diuretic and nephroprotective properties which increases blood flow to kidneys. This process increases the amount of water excreted through urination, dissolving kidney stones which is beneficial in combating cystitis and urethritis. The effect on burning micturition may be considered due to drugs like *Aragvadha*, *Gokshura* and *Dhanvayasa* (14) due to its *guru* and *snigdha guna*, *madhura rasa*, *madhura vipaka*, *shita virya* increases *kapha* and *kleda*, therefore due to increased *kleda* the quantity of *mutra* is increased.

The effect on Peri-orbital swelling (edema) in UTI patients, due to drugs like *Gokshura* which is included in *shothahara mahakashaya* (13) which helps in reducing *shotha (edema)* by its *mutravirechaka* property. These drugs are also exhibiting the antimicrobial effect by which they are useful in *Mutrakricchra* caused by the infections of those microorganisms. These Pharmacological properties help the drug in breakdown of the etiopathogenesis of *Mutrakricchra*.

#### Antimicrobial View

##### *Haritaki (Terminalia chebula)*

The ethanolic extract of *Terminalia chebula* has significant analgesic and antipyretic activities in mice and rats at the dose 400mg/kg and 600 mg/kg respectively. (15)

The aqueous and methanolic extract of *Terminalia chebula* were analysed to testify its antibacterial activities against bacteria causing enteric disorder *E. Coli*. Methanol and aqueous extract of *Terminalia chebula* has 14 mm and 13 mm zone of inhibition against *E. coli* showed potential bactericidal activity. This gram negative bacteria leads to UTI as *Haritaki* has shown antibacterial activity against it. (16)

An ethanolic extract of *Terminalia chebula* were found to be active with zone of inhibition is 16 mm against *K. pneumoniae* and 14 mm against *E. coli*. (17)

##### *Gokshura (Tribulus terrestris)*

The diuretic properties of *Tribulus terrestris* is due to large quantity of nitrates, potassium salts and essential oil present in fruits and seeds. (18)

The aqueous extract of *Tribulus terrestris* against *S. aureus*, *E. coli* and *P. aeruginosa* shows good antibacterial property. Out of these 3 bacteria, *S. aureus* shows growth Inhibition Zone 15 mm while *E. coli* and *P. aeruginosa* do not show inhibition zone i.e antibacterial property. (19)

An ethanolic extract of the fruits of *Tribulus terrestris* against experimentally induced urolithiasis in rats shows anti-urolithic effect. (20)

##### *Pashanbheda (Bergenia lingulata)*

The methanolic extract of *Bergenia lingulata* shows 06 mm mean diameter inhibition zone against *E. coli* & Minimum inhibitory concentration (MIC) for *E. coli* is 2500 (ug/ml). (21)

The Methanolic extract of *Bergenia lingulata* have dose- dependent diuretic action and has proven diuretic and anti-urolithic properties. (22)

##### *Dhanvayasa (Fagonia cretica)*

The methanolic and aqueous extract of *Fagonia cretica* shows antibacterial effect against different bacterias. Aqueous and methanolic extract of *F. cretica* has 16 mm & 14 mm zone of inhibition against *S. aureus*, Aqueous and methanolic extract of *F. cretica* has 15.4 mm & 15 mm zone of inhibition against *E. coli* while Aqueous and methanolic extract of *F. cretica* has 16.2 mm & 15 mm zone of inhibition against *P. aeruginosa*. The MIC for *S. aureus* is 0.06 mg/ml and *P. aeruginosa* is 0.25 mg/ml. (23)

##### *Aragvadha (Cassia fistula)*

The methanolic and aqueous extract of cassia fistula against different gram positive and gram negative bacterias. Aqueous and methanolic extract of *C. fistula* has 11.5 mm & 16.5mm zone of inhibition against *S. aureus*, the aqueous and methanolic extract of *C. fistula* has 16.5 mm & 16 mm zone of inhibition against *E. coli* while aqueous and methanolic extract of *C. fistula* has 10.5 mm & 14 mm zone of inhibition against *P. aeruginosa*, Aqueous and methanolic extract of *C. fistula* has 10 mm & 11.5 mm zone of inhibition against *Proteus spp.* (24)

The Methanolic extract of *Cassia fistula* exhibited antibacterial against *B. subtilis* (9-13 mm) and *S. aureus* (9-12 mm), *S. epidermidis* (10-12 mm). It was more effective against gram positive bacteria than gram negative bacteria. The *Aragvadha (C. fistula)* has proven as antibacterial and antioxidant property. (25)

## Discussion

In *Charaka Samhita, Sutrasthana* (26) enumerate the 8 type of *Mutrakricchra* further detailed *nidana panchaka* and *chikitsa* description was given in *chikitsasthana* (8) while in *Sushruta Samhita, Uttara tantra* (9) include *Mutraghata pratishedha* covers the disease with retention of urine. In *Kashyapa Samhita* (27), *Sutrasthana vednaadhyaya*, described in brief of *Mutrakricchra* in children, who cannot narrate the symptoms. In *Ashtang Hridaya* (28) the *Mutrakricchra* comes under *Mutra apravruttijanya vyadhi*.

Majority of drugs in 'Haritakyadi yoga' show *snigdha guna*, *shita virya*, *Madhura vipaka*, *pittaghna*, *mutravirechaka*, *bastishodhaka* property. It has been evaluated that along with antimicrobial, anti-urolithic, diuretic and anti-inflammatory effect. 'Haritakyadi yoga' play key role in future therapies of UTI.

The *Mutrakricchra* disease symptomatology resemble more closely to symptoms of Urinary Tract Infection (UTI). *E. coli* remains the predominant uropathogen (80%) isolated in community acquired uncomplicated infections followed by *Staphylococcus saprophyticus* (10-15%); *Klebsiella*, *Enterobacter*, *Proteus sp.* & *Enterococci* infrequently. Antibiotic resistance is major problem rise globally due to antibiotics being prescribed unnecessarily or



inappropriately (29). The exact mechanism for antimicrobial property can be explained on the basis of different in vitro study of individual drugs in *Haritakyadi Yoga*. The every content of *Haritakyadi Yoga* inhibit the growth of uropathogen and shown the antimicrobial effect by disk diffusion method.

## Conclusion

*Haritakyadi Yoga* seems to be an effective and safe formulation for *Muttrakricchra vyadhi* and can prove a good alternative to existing other modern drugs. The pharmacological properties help the drug in breakdown of the pathogenesis of *Muttrakricchra*. The every content also shows antibacterial property against many gram positive and gram negative bacterias which are responsible for UTI. *Haritakyadi Yoga* is also helpful in decreasing possibility of drug resistance and recurrence of UTI.

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