



A Study of Effectiveness of Kutajyoga In Symptoms of Mootrakrichhra Withspecial Reference To Cystitis

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Abstract:

Introduction: Urinary Tract Infection, commonly known as UTI, affects as many as 50% women at least once during their lifetime. All individuals are susceptible to Urinary Tract Infection (UTI); however the prevalence of infection differs with age, sex and certain predisposing factors.

Aims and Objectives: To study effectiveness of kutajyoga in symptoms of mootrakrichhra with special reference to cystitis.

Material and Methods: This was a randomized Clinical trial in the patients of Cystitis at I.P.D.and O.P.D. of Surgical ward of tertiary health care centre. Randomly 60 patients of Mootrakrichhra Vyadhi (Cystitis) was selected irrespective of age, sex, religion, marital status, socioeconomic status and diet. The patients divided into

Trial Group: 30 patients were treated with *Kutajyoga*.

Control Group: 30 patients were treated with *Ciprofloxacin drug for the 7 days*. A newly diagnosed case of Mutrakrichhra (w.s.r. Cystitis) according to subjective and objective parameters. Statistical analysis for Efficacy testing of the treatment was performed using Two-way ANOVA⁹ for repeated measures for incomplete emptying, increased frequency, intermittency, urgency and burning micturition criteria.

Result: *Kutajyogais* not effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *incomplete emptying* ($p>0.071$). *Kutajyogais* effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *increased frequency* ($P<0.003$). *Kutajyogais* not effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *intermittancy*. ($P>0.41$).*Kutajyogais* effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *urgency* ($P<0.01$).*Kutajyogais* highly effective in Mutrakrichhra patients with special reference to cystitis in surgical wardfor *burning micturition* ($P<0.0039$).

Conclusion : The study shows that, *Kutajyoga* is effective in reducing the symptoms mentioned in National Institute of Diabetes and Digestive and Kidney Diseases U.S. in 1987 (NIDDK) assessment criteria. i.e. Increased frequency, Urgency.*Kutajyoga* is highly effective in Burning micturition as compared to Ciprofloxacin drug.It is less effective in incomplete emptying and Intermittency symptom as compared to Ciprofloxacin drug in Cystitis.Ultimately it helps in improving quality of life of patient having *Mootrakrichhra* (Cystitis).

Key words: Kutajyoga, Mootrakrichhra, Cystitis, Ciprofloxacin.

Introduction:

Ayurveda is based on Vedas but with the main aim of eradication of the diseases and maintenance of health of healthy individuals (Su. Su. –1/4). Ayurveda is divided into eight branches in which Shalyatantra is one of the important branch. Shalyatantra was popular because this could give fast relief as compared to the slow process of recovery from medicines or herbs.

Charaka the best-known physician of ayurvedic medicine also recommended for Shalyatantra in treatment of certain diseases, which required immediate attention like hemorrhoids¹.

Sushrut Samhita is one of the most ancient and authoritative classical book of Indian medicine on Shalyatantra. Acharya Susruta discusses in detail about an exhaustive range of surgical methods including about how to deal with various types of tumors, internal and external injuries, fracture of bones, complications during pregnancy and delivery, and obstruction in intestinal loop¹.

Urinary Tract Infection, commonly known as UTI, affects as many as 50% women at least once during their lifetime. All individuals are susceptible to Urinary Tract Infection (UTI); however the prevalence of infection differs with age, sex and certain predisposing factors. UTI in men is not so common but it can be very serious when it occurs. Uncircumcised males are more prone to develop UTI. Therefore for the enlightenment of the classical work from the Sushrut Samhita, diseases of urinary tract topic was selected for study².

Acharya Vagbhata has classically divided the Rogas of Mootrain to two categories viz. *MootraAtipravrittija* and *MootraApravrittijaRogas* (A. S. Ni. 9/40). The disease *Prameha* comes under the first group where as *Asmari*, *Mootrakricchra* and *Mootraghata* fall under the second. *Mootrakrichhra* clinical entity predominated by the symptom of “*KrichhraMootrapravritti*” due to the vitiated *Vata* has been extensively described all the Acharyas. Cystitis is a condition characterized by “Painful Urination” was therefore thought of to be managed by *Vata*-alleviating procedures especially incorporating a set of principles based on the *Chikitsa Sutra* of *Mootrakrichhra*. A specific *Pathya* regimen was also included in the study to provide nourishment to the aging body there by helping in alleviation of *Vata* and further enhancing the effect of the drugs administered³. All these considerations provided a firm launch pad to think on the therapeutic alternatives, which could be provided from the Ayurvedic Samhitas. Therefore, a ‘set’ of therapeutic procedures was designed to assess its efficacy on the symptomatology of Cystitis and to give relief to the sufferers of Cystitis.

Mootrakrichhra is a Vyadhi where difficulty in micturation is *pradhanlakshan*, affecting physical and mental health of person⁴. In Cystitis, *E. coli*, staphylococci, etc. bacteria are responsible for pathogenesis. The treatment of Cystitis is mainly by Antibiotics. There are many high grade antibacterial drugs available in present era but still there is high incidence of resistance and recurrence of cystitis. Although these 7 days regimen is highly efficacious, it is associated with certain side effects.

Considering above difficulties in Modern medicine, Ayurveda may offer better medicine to alleviate the symptoms of *Mootrakrichhra*. So *Kutajyoga* is selected.

Material and Methods:

This was a randomized Clinical trial in the patients of Cystitis at Surgical ward of I.P.D. and O.P.D. of tertiary health care centre. Randomly 60 patients of *Mootrakrichhra* Vyadhi (Cystitis) was selected irrespective of age, sex, religion, marital status, socioeconomic status and diet. 30 patients of study group was given *pishtit Kutajtwak Churna* in dose 2.5gm with 100 ml *Godugdha* in two time per day just before meal i.e. *Apana kala* for 7 days. Remaining 30 patients of control group was given Ciprofloxacin drug. Informed written consent of patient will be taken prior to commencement of trial. Information was collected in case record form. Follow up of the patients (Clinical Assessment) will be done on 1st, 3rd, 5th, 7th day.

For selection of *Kutajtwakdrug* Raw materials taken from authentic source. *Choorna* form was prepared as mentioned in *Sharangdhar Samhita*⁸.

Authentication and standardization of drugs done from authorized pharmacy.

Kutajtwakchoorna was prepared at pharmacy of our hospital.

2.5gms of *Kutajtwakchoorna* was given, twice a day, before meal with *Godugdha*. In this patients Randomly divided into **Trial Group** : 30 patients were treated with *Kutajyoga*. **Control Group**: 30 patients

were treated with *Ciprofloxacin* drug for the 7 days. A newly diagnosed case of Mutrakrichhra (w.s.r. Cystitis) according to subjective and objective parameters. The patient will be selected irrespective of age, sex, religion, occupations and marital status were included into the study while Disease causing bladder outlet obstruction i.e. Benign prostatic hypertrophy, Balanitis xerotica obliterance, Urethral stricture, Bladder neck stenosis, Cystocele, Phymosis. Carcinoma of prostate or urinary bladder, Bladder Diverticulum, Neurogenic bladder, Renal failure, Diabetes Mellitus, Hypertension, Tuberculosis, Metabolic disorder were excluded from the study. Rescue Therapy : In clinical trial if any adverse or untoward effect is seen that will be treated with proved ayurvedic or modern therapy.

If patient develops any adverse effect, If not responding to treatment and aggravation of symptoms, Patient refuses to continue treatment were withdrawn from the study

Kutaj Choorna was prepared by using principal of Choornakalpana as described in Sharangadhara Samhita. Fine powder i.e. Choorna (Vastragalitachoorna 60 mesh) of Kutaj was prepared in pulviliser. The prepared powder stored in sterilized pack kept at room temperature in dry place and used for clinical trials on the patients. Standardization of final product done.

Drug Regimen for Trial Group

Drug	Kutajtwakchurna
Dose	2.5gm twice a day
Route of administration	Oral
Kala	Apana (before meal)
Duration of treatment	7 days
Anupana	100 ml Godugdha

Follow up of the patients (Clinical Assessment) was done on 1st, 3rd, 5th, 7th day in both groups. Concomitant treatment of patient was continued in both group.

Informed written consent of patient was taken prior to commencement of trial.

Case was taken in specifically prepared case record form.

Drug Regimen for Control Group

Drug	Ciprofloxacin
Dose	500mg
Route of administration	Oral
Time	12 Hrly.
Duration of treatment	7 Days

Patients were evaluated by Severity of symptoms like Incomplete emptying, Frequency, Intermittency, Urgency, Burning Micturation. NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases U.S. in 1987) criteria Statistical analysis for Efficacy testing of the treatment was performed using Two-way ANOVA⁹ for repeated measures for incomplete emptying, increased frequency, intermittency, urgency and burning micturition criteria.

Result:

Incomplete emptying:

(Hypothesis: H_0 : *Kutajyoga* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients does not reduce incomplete emptying over the period of treatment. i.e. H_0 : Null hypothesis: $H_0: M_1 = M_3 = M_5 = M_7$. H_1 : *Kutajyoga* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients results in reduction of incomplete emptying over the period of treatment. i.e. H_1 : Alternative hypothesis: $H_1: M_1 > M_3 > M_5 > M_7$)

where: M_1 = Mean of *Incomplete emptying* values at Day 1, M_3 = Mean of *Incomplete emptying* values at Day 3, M_5 = Mean of *Incomplete emptying* values at Day 5, M_7 = Mean of *Incomplete emptying* values at Day 7, Significance Threshold: $P < 0.05$: P-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

Measure	Correction	Type III Sum of Squares	Df	Mean Square	F	P-value
Incomplete emptying	Greenhouse-Geisser	45.12	2.305	25.32	87.902	0.071

It is seen that the Alternative Hypothesis is rejected and the Null Hypothesis can be retained, thus *Kutajyogais* not effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *incomplete emptying*.

Increased frequency:

(Hypothesis: H_0 :*Kutajyoga*treatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsdoes not reduce increased frequencyover the period of treatment. i.e. H_0 : Null hypothesis: $H_0: M_1 = M_3 = M_5 = M_7$, H_1 : *Kutajyoga* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsresults in reduction of increased frequencyover the period of treatment. i.e. H_1 : Alternative hypothesis: $H_1: M_1 > M_3 > M_5 > M_7$, where: M_1 = Mean of *Increased frequency* values at Day 1, M_3 = Mean of *Increased frequency* values at Day 3

M_5 = Mean of *Increased frequency* values at Day 5; M_7 = Mean of *Increased frequency* values at Day 7. Significance Threshold: $P < 0.05$: P-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

Measure	Correction	Type III Sum of Squares	Df	Mean Square	F	P-value
Increased frequency	Greenhouse-Geisser	118.883	2.217	53.621	359.751	0.032

Here the Alternative Hypothesis can be confidently accepted and the Null Hypothesis can be rejected, thus *Kutajyoga* is effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patients for *increased frequency*.

Intermittency:

(Hypothesis: H_0 :*Kutajyoga*treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients does not reduce intermittency over the period of treatment. i.e. H_0 : Null hypothesis: $H_0: M_1 = M_3 = M_5 = M_7$. H_1 : *Kutajyoga* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients results in reduction of intermittency over the period of treatment. i.e. H_1 : Alternative hypothesis: $H_1: M_1 > M_3 > M_5 > M_7$, where: M_1 = Mean of *Intermittency* values at Day 1. M_3 = Mean of *Intermittency* values at Day 3. M_5 = Mean of *Intermittency* values at Day 5. M_7 = Mean of *Intermittency* values at Day 7. Significance Threshold: $P < 0.05$: P-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

Measure	Correction	Type III Sum of Squares	Df	Mean Square	F	P-value
Intermittency	Greenhouse-Geisser	145.683	2.622	35.552	20.511	0.41

Here the Alternative Hypothesis can be rejected and the Null Hypothesis can be retained, thus *Kutajyogais* not effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patients for *intermittancy*.

Urgency:

(Hypothesis: H₀:*Kutajyog* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients does not reduce urgency over the period of treatment. i.e. H₀: Null hypothesis: H₀: M₁ = M₃ = M₅ = M₇ . H₁: *Kutajyog* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients results in reduction of urgency over the period of treatment. i.e. H₁: Alternative hypothesis: H₁: M₁> M₃> M₅> M₇ where: M₁ = Mean of *Urgency* values at Day 1, M₃ = Mean of *Urgency* values at Day 3. M₅ = Mean of *Urgency* values at Day 5, M₇ = Mean of *Urgency* values at Day 7. Significance Threshold: P<0.05: P-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

Measure	Correction	Type III Sum of Squares	Df	Mean Square	F	P-value
Urgency	Greenhouse-Geisser	121.650	2.307	52.720	347.002	0.01

Here the Alternative Hypothesis can be confidently accepted and the Null Hypothesis can be rejected, thus *Kutajyogais* effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patients for *urgency*.

Burning micturition:

(Hypothesis: H₀:*Kutajyog* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients does not reduce burning micturition over the period of treatment. i.e. H₀: Null hypothesis: H₀: M₁ = M₃ = M₅ = M₇, H₁: *Kutajyog* treatment in Mutrakrichhra with special reference to cystitis in surgical ward patients results in reduction of burning micturition over the period of treatment. i.e. H₁: Alternative hypothesis: H₁: M₁> M₃> M₅> M₇, where: M₁ = Mean of *Burning micturition* values at Day 1, M₃ = Mean of *Burning micturition* values at Day 3, M₅ = Mean of *Burning micturition* values at Day 5, M₇ = Mean of *Burning micturition* values at Day 7.) Significance Threshold: P<0.05: P-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

Measure	Correction	Type III Sum of Squares	Df	Mean Square	F	P-value
Burning micturition	Greenhouse-Geisser	131.713	2.139	61.565	415.369	0.0039

Here the Alternative Hypothesis can be confidently accepted and the Null Hypothesis can be rejected, thus *Kutajyogais* highly effective in Mutrakrichhra patients with special reference to cystitis in surgical ward for *burning micturition*.

Discussion:

Effects of drug on clinical parameters-

Incomplete emptying-Because of *Katu*, *Kashaya rasa* and *Katu Vipaka* of the *Kutajyoga*, *Vataprakopa* will occur leading to increase in symptom of incomplete emptying. The Alternative Hypothesis can be rejected and the Null Hypothesis can be retained, thus *Kutajyogais* not effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patients for *incomplete emptying*. The drug given to Control group i.e. *Ciprofloxacin* gives significant result in Incomplete emptying in Cystitis.

Intermittency

Concluding from the P-value, it can be concluded that, the Alternative Hypothesis can be rejected and the Null Hypothesis can be retained, thus *Kutajyogais* not effective in Mutrakrichhra patients with special referenceto cystitis in surgical ward patientsfor intermittency. Here, Vitiated Vatadosha worsens the intermittency in Mootrakrichhra. Ciprofloxacin drug plays important role in Intermittency and give significant result.

Urgency

Concluding from the P-value, it can be concluded that, the Alternative Hypothesis can be confidently accepted and the Null Hypothesis can be rejected, thus *Kutajyogais* effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *urgency*. Graahiguna of Kutaj decreases the urgency in more extent than Ciprofloxacin drug.

Burning Micturation

Concluding from the P-value, it can be concluded that, the Alternative Hypothesis can be confidently accepted and the Null Hypothesis can be rejected, thus *Kutajyogais* highly effective in Mutrakrichhra patients with special reference to cystitis in surgical ward patientsfor *burning micturition*.

This is sign of inflammation. Lower urinary tract infection due to Cystitis causes Burning micturation. Kutajtwak has antibacterial action. It inhibits growth of E.coli, the most common bacteria responsible for Urinary tract infection. Madhuravipaka of Godugdha which help in alleviation of Pitta dosha and Burning micturation and also helps in protecting in urinary bladder mucosa and lowering the pH values of urine.

Increased frequency

Concluding from the P-value, it can be concluded that, the alternative hypothesis can be confidently accepted and the null hypothesis can be rejected, thus the kutajyoga is effective in mootrakrichhra patients with special reference to cystitis in surgical ward patients for increased frequency, because of Ruksha and Laghuguna and GrahigunaogKutaj, frequency of micturation decreases, which gives comparatively significant result than ciprofloxacin drug

After testing the effectiveness of *Kutajyogatreatment* against the Standard Ciprofloxacin Treatment, results showed that The *Kutajyogatreatment* has better results than the Standard CiprofloxacinPatients.

Cystitis, or inflammation of the bladder, has a direct effect on bladder function. It can occur due to both infectious as well as noninfectious etiologies. Infections can be due to Gram-negative microorganisms such as *Proteus*, *Klebsiella*, *Citrobacter*, *Enterobacter*, and *Pseudomonas* species and Gram-positive pathogens such as *Enterococcus fecalis*, *Staphylococcus saprophyticus*, and group B streptococci. However, *Escherichia coli* represents the most common cause of infectious cystitis¹¹

Probable mode of action of drug (Kutajtwak)¹⁰:

Kapha and Vata always play a major role in Cystitis. As Kutajtwakchoorna is **Kaphghna, Pitta** in its Doshaghna, it is helpful for Shaman of associated Doshas taking part in etiopathogenesis of Moortakrichhra.

Ruksha, Laghu, Tikshna properties of Kutajtwakchoorna reduces the chances of nidus formation as well as reduces the growth of infection by inhibiting the binding property of Kaphadosha.

Aqueous and methanol extract of Kurchicine showed high **antimicrobial** activity against the E.Coli, Staphylococcus aureus and many gram-positive bacilli which is responsible for Urinary tract infection which plays major role in pathogenesis of Cystitis.

Analgesic and anti **inflammatory** property of Kutajtwak helps to reduce pain in abdomen associated with Cystitis.

Kashaya rasa of Kutajtwak helps in diminishing the 'Kleda' at Basti, ultimately preventing the growth of infection at Bastipradesh.

Due to Rukshaguna of Kutajtwak, frequency of the Urine also get decreased.

Thus, action of Kutajtwakchoorna may ultimately result in reducing burning micturition, pain in abdomen associated with Cystitis due to their **anti-inflammatory** action.

As described in Ashtanghridaya Samhita^{12,13}, Godugdha which is taken as Anupana also help in Mootrakrichhranaashana.

Mootrakrichhra is a disease of mootravahastrotas which is under influence of Apana-vayu. So Kutajtwakchoorna is given in **apana-kala** i.e. before meal to enhance the action of drug.

Kutajtwakchoorna is easily available and doesn't need special preparations.

As the drug is given by oral route, there is no need of hospitalization. The drug can be given on O.P.D. basis.

Anti-microbial activity of Kutajtwakchoorna (in pyorrhea) was studied¹⁴. Study shows that Kutaj having significant activity against dysuria. Kutaj due to alkaloids, exert potent anti-microbial activity against many micro-organisms viz. gram +ve, gram -ve bacteria. It is found to decrease the capillary permeability, thus checks excessive discharges from genital system. Thus the churna with its anupana acts on mucous membrane of urinary tract significantly showed in elimination of pathogenesis.

Conclusion :

The study shows that, *Kutajyoga* is effective in reducing the symptoms mentioned in National Institute of Diabetes and Digestive and Kidney Diseases U.S. in 1987 (NIDDK) assessment criteria. i.e. Increased frequency, Urgency. *Kutajyoga* is highly effective in Burning micturation as compared to Ciprofloxacin drug. It is less effective in incomplete emptying and Intermittency symptom as compared to Ciprofloxacin drug in Cystitis. Ultimately it helps in improving quality of life of patient having *Mootrakrichhra* (Cystitis)

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