A Study of Effectiveness of Kutajyoga In Symptoms of Mootrakrichhra With special 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 forEfficacy testing of the treatment was performed using Two-way ANOVA 9 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 havingMootrakrichhra (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. Aacharya 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. Thereforefor 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 Mootra to two categories viz. MootraAtipravrittija and MootraPravrittija Rogas(A. S. Ni. 9/40). The disease Pramehacomes under the first group where as Asmari, Mootrakricchraand Mootraghatafall under the second.Mootrakrichhra clinical entity predominated by the symptom of “KrichhraMootrapravritti” due to the vitiated Vatahas beenextensively 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 Pathyaregimen was also included in the study to provide nourishment to the aging body there by helping in alleviation of Vataand 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 Ayurvedicsamhitas. 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 cistitis. 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 ofI.P.D.and O.P.D. of tertiary health care centre. Randomly 60 patients of Mootrakrichhra Vyadihi (Cystitis) was selected irrespective of age, sex, religion, marital status, socioeconomic status and diet.30 patients of study group wasgiven pishit 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. Choornaform was prepared as mentioned in Sharangdhar Samhita⁸. Authentification 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 (Vastragallachoorana 60 mesh) of Kutaj was prepared in pulveriser. 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.

<table>
<thead>
<tr>
<th>Drug Regimen for Trial Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drug</strong></td>
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<tr>
<td>Dose</td>
</tr>
<tr>
<td>Route of administration</td>
</tr>
<tr>
<td>Kala</td>
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<tr>
<td>Duration of treatment</td>
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<tr>
<td>Anupana</td>
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</tbody>
</table>

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.

Case was taken in specifically prepared case record form.

<table>
<thead>
<tr>
<th>Drug Regimen for Control Group</th>
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<tbody>
<tr>
<td><strong>Drug</strong></td>
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<tr>
<td>Dose</td>
</tr>
<tr>
<td>Route of administration</td>
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<tr>
<td>Time</td>
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<tr>
<td>Duration of treatment</td>
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</tbody>
</table>

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 ANOVA for repeated measures for incomplete emptying, increased frequency, intermittency, urgency and burning micturition criteria.

**Result:**

**Incomplete emptying:** (Hypothesis: H₀: 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. H₀: Null hypothesis: H₀: M₁ = M₃ = M₅ = M₇. H₁: 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. H₁: Alternative hypothesis: H₁: M₁ > M₃ > M₅ > M₇)
where: $M_1 = \text{Mean of } Incomplete\ emptying \text{ values at Day 1}$, $M_3 = \text{Mean of } Incomplete\ emptying \text{ values at Day 3}$, $M_5 = \text{Mean of } Incomplete\ emptying \text{ values at Day 5}$, $M_7 = \text{Mean of } Incomplete\ emptying \text{ values at Day 7}$, Significance Threshold: $P<0.05$: $P$-values less than 0.05 will be considered to be significant.)

TWO-Way ANOVA Results:

<table>
<thead>
<tr>
<th>Measure</th>
<th>Correction</th>
<th>Type III Sum of Squares</th>
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<th>F</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incomplete emptying</td>
<td>Greenhouse-Geisser</td>
<td>45.12</td>
<td>2.305</td>
<td>25.32</td>
<td>87.902</td>
<td>0.071</td>
</tr>
</tbody>
</table>

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 patients for incomplete emptying.

Increased frequency:
(Hypothesis: $H_0$: Kutajyogatreatment in Mutrakrichhra with special reference to cystitis in surgical ward patients does not reduce increased frequency 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 increased frequency over the period of treatment. i.e. $H_1$: Alternative hypothesis: $H_1$: $M_1 > M_3 > M_5 > M_7$, where: $M_1 = \text{Mean of } Increased\ frequency \text{ values at Day 1}$, $M_3 = \text{Mean of } Increased\ frequency \text{ values at Day 3}$, $M_5 = \text{Mean of } Increased\ frequency \text{ values at Day 5}$, $M_7 = \text{Mean of } Increased\ frequency \text{ values at Day 7}$. Significance Threshold: $P<0.05$: $P$-values less than 0.05 will be considered to be significant.)

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</thead>
<tbody>
<tr>
<td>Increased frequency</td>
<td>Greenhouse-Geisser</td>
<td>118.883</td>
<td>2.217</td>
<td>53.621</td>
<td>359.751</td>
<td>0.032</td>
</tr>
</tbody>
</table>

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: $H_0$: Kutajyogatreatment 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: $M_1 = \text{Mean of } Intermittancy \text{ values at Day 1}$, $M_3 = \text{Mean of } Intermittancy \text{ values at Day 3}$, $M_5 = \text{Mean of } Intermittancy \text{ values at Day 5}$, $M_7 = \text{Mean of } Intermittancy \text{ values at Day 7}$. Significance Threshold: $P<0.05$: $P$-values less than 0.05 will be considered to be significant.)

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</tr>
</thead>
<tbody>
<tr>
<td>Intermittancy</td>
<td>Greenhouse-Geisser</td>
<td>145.683</td>
<td>2.622</td>
<td>35.552</td>
<td>20.511</td>
<td>0.41</td>
</tr>
</tbody>
</table>
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: Kutajyogatreatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsdoes not reduce urgency over the period of treatment. i.e. H₀: Null hypothesis: H₀: M₁ = M₃ = M₅ = M₇ . H₁: Kutajyogatreatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsresults 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.)

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<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urgency</td>
<td>Greenhouse-Geisser</td>
<td>121.650</td>
<td>2.307</td>
<td>52.720</td>
<td>347.002</td>
<td>0.01</td>
</tr>
</tbody>
</table>

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: Kutajyogatreatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsdoes not reduce burning micturition over the period of treatment. i.e. H₀: Null hypothesis: H₀: M₁ = M₃ = M₅ = M₇. H₁: Kutajyogatreatment in Mutrakrichhra with special reference to cystitis in surgical ward patientsresults 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:**

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<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burning micturition</td>
<td>Greenhouse-Geisser</td>
<td>131.713</td>
<td>2.139</td>
<td>61.565</td>
<td>415.369</td>
<td>0.0039</td>
</tr>
</tbody>
</table>

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 patients for burning micturition.

**Discussion:**

**Effects of drug on clinical parameters-**

**Incomplete emptying**-Because of Katu, Kashaya rasa and KatuVipaka 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 reference to cystitis in surgical ward patients for 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 patients for 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 patients for burning micturation.

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 Grahigunao Kutaj. 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 Ciprofloxacin Patients.

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 cystitis.

Probable mode of action of drug (Kutajtwak):
Kapha and Vata always play a major role in Cystitis. As Kutajtwakchoorna is Kaphghna, Pitta in its Doshaghnya, 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, 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 studied\textsuperscript{14}. 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 micrturition 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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