A CLINICAL AND EXPERIMENTAL STUDY OF PITTAJA MUTRAKRICHHA W. S. R. TO UTI AND ITS MANGAMENT WITH AN AYURVEDIC FORMULATION

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ABSTRACT
The term Mutrakrichha is a disease of Mutravaha Srotasa, there are many cardinal symptoms of Mutrakrichha but the main feature is Kricchrata (Painful micturation). Pitta dosha and Vata dosha (Mainly Apana Vayu) are the Dosha which are vitiated in Pittaja Mutrakrichha which effect the Basti and Mutravaha Srotasa which effect the patient and produce symptoms like difficulty in micturation, burning micturation, hematuria and increase frequency of micturation. These symptoms basically resembles the features of lower urinary tract infection which is caused by inflammaton of urethra and urinary bladder which is a serious problem for patients. There are many antibiotics in modern sciences still the disease are reoccurring in the society. So the trial was undertaken to find out safe and cost effective drug in Ayurvedic formulations for its management. In the present study minimum of 30 patients diagnosed on the symptomatic criteria, urine culture positive, were given Dhattryadi Kwatha irrespective of caste, religion & socio economic status. The duration of trial was 14 days. The observations obtained are analysed statistically and is observed that Dhattryadi kwatha is a effective drug for Mutrakrichha.

KEYWORDS: Mutrakrichha, Mutravaha srotas, Kricchrata, Apana vayu, Dhattryadi kwatha.

INTRODUCTION
Mutrakrichha is a disorders of Mutravaha srotas. There is a wide description in our classical texts reflects that it has a great prevalence in ancient period. It is given in diseases of Mutravaha srotas in general and also explained as a whole disease in separate chapter. Most of the disorders of urinary system are described in the form of 8 types of Mutrakrichha, 13 types of Mutraghata, 4 types of Asmari and 20 types of Prameha. It has been described in Ayurvedic text, mutraroga into two major types i.e. Mutra-Apvruttijanya and Mutra-Atipvruttijanya disorders. Mutrakrichha comes under Mutra-Apvruttijanya disorders.[1] Krichhta and Vibhandha are the chief complaints present in Mutrakrichha but others has cleared this controversy by citing that both the features are found in Mutrakrichha but Krichtha predominates.[3]

Therefore, it can be eluded that Mutrakrichha is a disorder of Mutravaha Srotas, which includes those forms of urinary disorders where Krichtha is the cardinal feature. In the Pittaja Mutrakrichha, the vitiated Pitta Dosha along with Vata i.e. Apana Vayu on reaching the Vasti afflicts the Mutravaha Srotas due to which the patient feels Krhrna Mutrata, Peeta Mutrata, Sarakka Mutrata, Sadaka Mutrata, Saruya Mutrata and Muhur-Muhar Mutrata.[2,3] According to modern point of view Urinary Tract Infection may be subdivided in to upper Urinary Tract Infection (i.e. Pyelonephritis, Prostatitis, Perinephric abscess) and lower Urinary Tract Infection (i.e. Urethritis and Cystitis). Clinical presentation of Pittaja Mutrakrichha shows close resemblance to UTI’s as described in modern texts especially with lower Urinary Tract Infections. Therefore, present study is an attempt to define Pittaja Mutrakrichha on scientific grounds vis- a- vis Urinary Tract Infection.Urinary tract infection is a broad term that encompasses both asymptomatic microbial colonization of the urine and symptomatic infection with microbial invasion and inflammation of urinary tract. E.coli is the most common causative organism to cause UTI (80% cases).[13] The present study has been carried out with one of the preparation described in Bhaishajya Ratnavali i.e. “Dhattryadi kwatha”. So that the progression of disease can be controlled.

AIMS AND OBJECTIVES
a. To evaluate the efficacy of an Ayurvedic formulation in the management of Pittaja Mutrakrichha with special reference to urinary tract infection.
b. To establish a safe and cost effective medicine for the treatment of Mutrakrichha.
c. To study the other associated effects of the trial drugs.
d. To review the Ayurvedic and modern literature related to Mutrakrichha and urinary tract infection.

**Ethical Clearance - no. - 21/2012**
The proposed clinical study was presented in the form of a synopsis in front of the institutional ethics committee. The clinical trial was started after the approval for the chairman of Ethics Committee.

**MATERIALS AND METHODS**
For the accomplishment of above aims and objectives, the research work has been designed in the following manner:

i. **Conceptual study:-** First of all conceptual study of selected topic was done in available ancient as well as modern literature. Along with this the review of literature of drugs and available previous work was also done.

ii. **Clinical study:-** Clinical study was the main component of present research work. It was, carried out only in a single trial group. Total 30 patients with signs and symptoms suggestive of Pittaja Mutrakrichha were selected from OPD and IPD of R.G.Govt. P.G. Ayu. College and Hospital Paprola (H.P.). These patients were screened with respect to symptomatology, urine analysis, haematological and microbiological studies. Out of these 30 patients, 26 patients completed the trial, only 4 patients could not complete the trial as they did not return on the schedule time for evaluation and were considered out of research trial.

**Selection of patients**
Patients of Pittaja Mutrakrichha fulfilling the inclusion criteria were, registered from the OPD/IPD of R.G.Govt.P.G.Ayu. Hospital, Paprola, Distt. Kangra (H.P.). Patients were selected in the age group between 16 to 70 years irrespective of sex, caste, and religion.

**Inclusion criteria**

a. **Subjective criteria**
It was based on the signs and symptoms of Pittaja Mutrakrichha, described in Ayurvedic classics as well as signs and symptoms of urinary tract infections as described in modern text.
1. Peeta mutrata (Turbidity of urine)
2. Sarakta mutrata (Haematuria)
3. Saruja mutrata (Painful micturition)
4. Sadaha mutrata ( Burning micturition)
5. Krichhra mutrata (Difficulty in micturition)
6. Muhur-muhur mutrata (Increased frequency of micturition)

Out of these above-mentioned clinical features, presence of at least three features was necessary to include the patients in clinical trial.

b. **Objective criteria:** Positive urine culture was the main objective criteria for diagnosis and inclusion of patients in the clinical trial. Only culture positive patients were included in the trial group.

**Investigations**
The following investigations were, carried out to include the patients in clinical trial and to rule out other concomitant pathological conditions.

1. **Urinalysis**
   a. **Physical examination**
      i. Colour and appearance
      ii. Reaction
      iii. Specific Gravity
      iv. Urinary volume in 24 hours

   b. **Chemical examination**
      i. Sugar
      ii. Protein

   c. **Microscopic examination**
      i. Pus cells
      ii. RBC’s
      iii. WBC’s
      iv. Casts
      v. Crystals

2. **Haematological investigations**
The routine base line haematological investigations were done in every case before and after the completion of clinical trial such as Hb gm%, TLC, DLC, ESR.

3. **Biochemical investigations**
Blood urea, serum creatinine and blood sugar level estimation were, carried out to rule out other concomitant pathologies to exclude the renal disease compromised patients.

4. **Radiological investigations**
USG of urinary system (KUB) and Plain x-ray abdomen were, done as per requirement.

**Exclusion criteria**
The following patients were excluded from the clinical trial.
1. Patients not willing for trial.
2. Patients below 16 years and above 70 years of age.
3. Patients with impaired renal function.
5. Diabetic and immuno compromised patients.
6. Case of obstructive uropathy such as BPH etc.
7. Polycystic Kidney.

**Consent of the patients**
All patients selected for trial were, explained the nature of study and their written consent was, obtained on the
Design of the study
The diagnosed patients who fulfilled the inclusion criteria were, subjected to the clinical trial. All the registered patients were, managed in a single trial group. After registration, an elaborated history was taken and detailed physical and systemic examination was conducted. In addition to it Srotas Pariksha, Asthvidha Pariksha and Dashvidha Pariksha were also, carried out. In every case, the probable pathogenesis was, explored depicting all the Samprapti Ghatak.

Laboratory investigations like urine examination, urine culture, and routine blood tests were, carried out in the beginning and at the completion of trial.

Preparation of the trial drug
Fresh raw herbs were purchased from open market and after proper verification by experts of Department of Dravya Guna the final drug was prepared under the guidelines of Depattment of Rasa Shastra and Bhaishajya kalpna in college pharmacy. Finished trial drugs were further tested in the state government drug-testing laboratory, Joginder Nagar.

Contents of formulation were taken in sum bhaga. Yavakut churna of the ingredients was given to the patients as 25gm per dose. Pa

Dose
The registered patients were given the trial drug i.e. Dhatryadi Kwatha in dose of 50 ml BD.

Duration of trial
The total duration of trial was 14 days.

Instructions to the patients
The Pathya-Apathya were advised to every patient.
Pathya: The dietary and behavioral schedule advised to patients.
a. High fluid intake, at least 3 liters a day.
b. Fruits containing high water content e.g. coconut.
c. Use of Takra and curd.
d. Maintenance of perineal hygiene.
e. Complete and frequent emptying of the bladder.
f. Voiding before and after coitus.

Apathya: The dietary & behavioral schedule prohibited to the patients.
a. Low intake of water.
b. Poor personal hygiene.
c. Over indulgence in sexual activity.
d. Suppression of the urge of micturition.
e. Use of spermicides and diaphragms.

Assessment of the patients
Assessment of the effects of therapy was done on the basis, of various subjective and objective criteria. Patients were, assessed after one week of the commencement of clinical trial and after completion of trial i.e. after 14 days. In first follow up, the patients were assessed on clinical grounds only. The patients who did not come for follow up were, considered drop out. At the end of 14days, final detailed examination of the patients was, carried out including all investigations.

Assessment criteria
For the purpose of assessment of various signs and symptoms, scoring system was adopted. Gradation of various signs and symptoms is as under:

a. Clinical assessment

Subjective criteria - On the basis of clinical symptoms
i) Saruja mutrata (Painful micturition)
   - No pain during micturition 0
   - Mild pain during micturition 1
   - Moderate pain during micturition 2
   - Severe pain during micturition 3

ii) Muhur mutrata (Increased frequency of urine)
   - Patient passing urine 4-5 times a day 0
   - Patient passing urine 6-10 times a day 1
   - Patient passing urine 11-20 times a day 2
   - Patient passing urine >21 times a day 3

iii) Sadah mutrata (Burning micturition)
   - No burning micturition 0
   - Mild burning micturition 1
   - Moderate burning micturition 2
   - Severe burning micturition 3

iv) Peeta/Shweta Mutrata (Turbid urine)
   - No cloudiness/clear urine 0
   - Definite cloudiness (without flocculation) 1
   - Granular cloudiness (without flocculation) 2
   - Dense opaque cloudy flocculation 3

v) Krichra Mutrata (Difficulty in micturition)
   - No difficulty during micturition 0
   - Difficulty at the beginning of the act 1
   - Difficulty at beginning & partially during rest of the act 2
   - Difficulty present throughout the act 3

vi) Sarakta Mutrv ata (Haematuria)
   - No RBC /HPF in the urine 0
   - RBC 1+/HPF in the urine 1
   - RBC2++/HPF in the urine 2
   - RBC3+++/4++++/HPF in the urine 3

b. Investigational Assessment
It was assessed by evaluating already mentioned laboratory findings, which were carried out at the time of commencement of clinical trial. Some of these were assessed by grading them and others were assessed.
simply evaluating the results obtained from them as follow.

1) Pus cells in urine grade
   - 0-2 PHF: 0
   - 3-10 PHF: 1
   - 11-20 PHF: 2
   - 21 and above PHF: 3

2) RBC’S in urine
   - 0-2 PHF: 0
   - 3-10 PHF: 1
   - 11-20 PHF: 2
   - 21 and above PHF: 3

3) Urine culture
   Urine culture reports were, compared with that of done before and after completion of clinical trial.
   - No growth
   - Bacterial count up to $10^1$: 1
   - Bacterial count $10^6$ to $10^9$: 2
   - Bacterial count $>10^{10}$: 3

4) ESR and TLC were, assessed by simply evaluating their value before and after completion of clinical trial.

Progress
Once the therapy was started, the patients were examined during every follow up for pulse, temperature, blood pressure, urine output, turbidity, burning micturition, haematuria, frequency of micturition, hesitancy, appetite, bowel habits, and general condition. All cases were subjected to clinical observation throughout the course of the treatment to assess the efficacy of drug from time to time. At the end of 15 days, final examination of the patient was carried out including all investigations.

The total effect of therapy was assessed on the basis of relief observed over the pretrial values. The change in urine culture was also analyzed after the treatment.

Assessment of results
For the overall assessment of the therapy, the results were classified into four groups as listed below:

a. Cured
   Absence of all the subjective and objective criteria of inclusion in trial.
   a. Absence of turbidity of urine.
   b. No haematuria.
   c. No painful micturition.
   d. No burning micturition.
   e. No difficulty in passing urine.
   f. Patient passing urine 4-5 times in 24 hours.
   g. No abnormality in urine microscopy
   h. Negative urine culture.

b. Markedly improved
   More than 75% of relief in the cardinal as well as the constitutional features.
   Normal routine laboratory investigations.
   Urine culture became negative after treatment.

   c. Mildly improved
      i. 50% relief in cardinal as well as other constitutional features.
      ii. Normal routine laboratory investigations.
      iii. Urine culture positive after treatment.

   d. Unchanged
      i. Less than 25% relief in cardinal as well as other constitutional features.
      ii. Laboratory investigations remained unchanged after treatment.
      iii. Urine culture remained positive.

Statistical Evaluation and Analysis of results
The data related to all the features was, collected and then statistically analyzed. The status of UTI was assessed bearing on the grades of various variables compared between pretrial and post trial values in terms of percentage (based on mathematical means and its difference). Values between two variables were compared with student (t) test for dependent samples by using the degree of freedom p value (two tailed). The results were expressed in terms of mean, standard deviation (S.D.) and standard error (S.E.). p value less than 0.001 (p<.001) was considered as highly significant, p value less than 0.01 (p<.01) as moderately significant and less than 0.05 (p<.05) as significant where as p value more than 0.05 (p>.05) was considered as insignifiant.

Follow up studies
The patients who had completed the clinical trial were kept under observation for a period of one month to evaluate the response of the drugs with respect to relief of symptoms and to assess the development of side effects and recurrence of disease. They were advised to report fortnightly up to duration of one month.

OBSERVATIONS
In the present study a total 30 patients with signs and symptoms suggestive of Pittaja Mutrakrichha (UTI) were selected from OPD and IPD of R.G.Govt.P.G.Ayu. Collage and Hospital Paprola (H.P). Out of these 30
patients, only 26 patients completed the trial. Four patients could not complete the trial as they did not return back on the scheduled time for the evaluation. These 26 patients were studied in single trial group.

Observations made on all the 26 patients are described here, where as results obtained will be described separately.

1. **Age**
   
   **Table no. 1: Age wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Age in year</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20</td>
<td>1</td>
<td>3.84</td>
</tr>
<tr>
<td>21-30</td>
<td>12</td>
<td>46.15</td>
</tr>
<tr>
<td>31-40</td>
<td>11</td>
<td>42.30</td>
</tr>
<tr>
<td>41-50</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>51-60</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>61-70</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2. **Sex**
   
   **Table No. 2: Sex wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Sex</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>92.30</td>
</tr>
</tbody>
</table>

3. **Religion**
   
   **Table no. 3: Religion wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Religion</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>26</td>
<td>100%</td>
</tr>
</tbody>
</table>

4. **Marital status**
   
   **Table No. 4: Marital status wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Marital status</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>23</td>
<td>88.46%</td>
</tr>
<tr>
<td>Unmarried</td>
<td>3</td>
<td>11.54%</td>
</tr>
</tbody>
</table>

5. **Habitat**
   
   **Table No. 5: Habitat wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Habitat</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural</td>
<td>26</td>
<td>100%</td>
</tr>
</tbody>
</table>

6. **Occupation- Occupation wise distribution of 26 patients.**
   
   **Table no. 6**
   
<table>
<thead>
<tr>
<th>Occupation</th>
<th>No of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>House wives</td>
<td>12</td>
<td>46.15</td>
</tr>
<tr>
<td>Students</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>Employee</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>Farmer</td>
<td>8</td>
<td>30.76</td>
</tr>
</tbody>
</table>

7. **Education**
   
   **Table no. 7: Education wise distribution of 26 patients.**
   
<table>
<thead>
<tr>
<th>Education</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uneducated</td>
<td>2</td>
<td>7.69%</td>
</tr>
<tr>
<td>Primary</td>
<td>13</td>
<td>50%</td>
</tr>
<tr>
<td>Matric</td>
<td>9</td>
<td>34.61%</td>
</tr>
<tr>
<td>Graduate</td>
<td>2</td>
<td>7.69%</td>
</tr>
</tbody>
</table>

**Demographic profile**

The demographic data of 26 patients of Pittaja Mutrakrichhra is discussed here on the basis of their age, sex, religion, habitat, dietary habits, occupation social status, addiction, Prakriti etc.
8. **Socio-Economic status**  
Table no. 8: Socio-economic status wise distribution of 26 Patients  

<table>
<thead>
<tr>
<th>Socio economic status</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>10</td>
<td>38.46</td>
</tr>
<tr>
<td>Middle</td>
<td>16</td>
<td>61.53</td>
</tr>
</tbody>
</table>

9. **Dietary habits**  
Table no. 9: Dietary habits wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Diet</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed</td>
<td>14</td>
<td>53.44</td>
</tr>
<tr>
<td>Vegetarian</td>
<td>12</td>
<td>46.16</td>
</tr>
</tbody>
</table>

10. **Life style**  
Table no. 10: Life style wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Life style</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Working</td>
<td>14</td>
<td>53.84%</td>
</tr>
<tr>
<td>Sedentary</td>
<td>12</td>
<td>46.16%</td>
</tr>
</tbody>
</table>

11. **Addiction**  
Table no. 11: Addiction wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Addiction</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking &amp; Alcohol</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>No addiction</td>
<td>24</td>
<td>84.62%</td>
</tr>
</tbody>
</table>

12. **Hygiene**  
Table no. 12: Hygiene wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Hygiene</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>Medium</td>
<td>12</td>
<td>46.15</td>
</tr>
<tr>
<td>Poor</td>
<td>10</td>
<td>38.46</td>
</tr>
</tbody>
</table>

13. **Sleep**  
Table no. 13: Sleep wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Sleep</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>19</td>
<td>73.07</td>
</tr>
<tr>
<td>Disturbed</td>
<td>7</td>
<td>26.92</td>
</tr>
</tbody>
</table>

14. **Deha prakriti**  
Table no. 14: Deha prakriti wise distribution of 26 patients.  

<table>
<thead>
<tr>
<th>Deha prakriti</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vata Pittaja</td>
<td>12</td>
<td>46.15</td>
</tr>
<tr>
<td>Vata Kaphaja</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>Pitta Kaphaja</td>
<td>10</td>
<td>38.46</td>
</tr>
</tbody>
</table>

15. **Clinical features**  
Table no. 15: Signs and Symptoms of Pittaja mutrakrichhra observed in 26 patients.  

<table>
<thead>
<tr>
<th>Clinical features</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sadaha mutrata</td>
<td>23</td>
<td>88.46</td>
</tr>
<tr>
<td>Saruja mutrata</td>
<td>7</td>
<td>26.92</td>
</tr>
<tr>
<td>Krichhra mutrata</td>
<td>20</td>
<td>76.92</td>
</tr>
<tr>
<td>Muhur-muhur mutrata</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Peeta mutrata</td>
<td>13</td>
<td>50</td>
</tr>
<tr>
<td>Sarakta mutrata</td>
<td>5</td>
<td>19.23</td>
</tr>
</tbody>
</table>
16. Constitutional features
Table no. 16: Constitutional features observed in 26 patients of *pitta multip krichhra*.

<table>
<thead>
<tr>
<th>Constitutional features</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fever</td>
<td>9</td>
<td>34.62</td>
</tr>
<tr>
<td>Hesitancy</td>
<td>3</td>
<td>11.53</td>
</tr>
<tr>
<td>Stranguary</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Urgency</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>Anorexia</td>
<td>6</td>
<td>23.07</td>
</tr>
<tr>
<td>Constipation</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>Retention of urine</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

17. Urine analysis
Table no. 17: Urine analysis findings observed in 26 patients of *pitta multip krichhra*.

<table>
<thead>
<tr>
<th>Urine analysis finding</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pus cells</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>RBC’S</td>
<td>5</td>
<td>19.23</td>
</tr>
<tr>
<td>Urine proteins</td>
<td>13</td>
<td>50</td>
</tr>
<tr>
<td>Urine Reaction (acidic)</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Positive urine culture</td>
<td>26</td>
<td>100</td>
</tr>
<tr>
<td>Urine volume &lt;1 liter/24 hours</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

18. Microbiological findings
Table no. 18: Microbiological findings wise distribution of 26 patients.

<table>
<thead>
<tr>
<th>Micro-organism</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>E. Coli</td>
<td>19</td>
<td>73.07</td>
</tr>
<tr>
<td>Staphylococcus</td>
<td>4</td>
<td>15.38</td>
</tr>
<tr>
<td>E. Coli &amp; Staphylococcus</td>
<td>2</td>
<td>7.69</td>
</tr>
<tr>
<td>Gram –ve Coccol bacilli</td>
<td>1</td>
<td>3.84</td>
</tr>
</tbody>
</table>

19. Blood analysis findings
Table no. 19: Blood analysis findings observed in 26 patients.

<table>
<thead>
<tr>
<th>Blood analysis finding</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leucocytosis</td>
<td>1</td>
<td>3.84%</td>
</tr>
<tr>
<td>Raised ESR</td>
<td>17</td>
<td>65.38%</td>
</tr>
</tbody>
</table>

Effects of the therapy
A total 30 patients of *Pittaja Mutrakrichha* were registered for present clinical study. Out of them 4 patients could not complete the trial, therefore they were considered drop out and remaining 26 patients completed the therapy. Effects of the therapy are as under:-

Effects of the therapy on clinical features
*Peeta mutrata* (Turbidity of urine):-  
The mean score of Peeta mutrata was 1.15 before treatment and it reduced to 0.38 after treatment, giving 66.66 % relief, which was statistically highly significant (*p*<0.001).
*Sarakta mutrata* (Haematuria):-  
Mean score of Sarakta mutrata before treatment was 1.60, which reduced to 0.40 after treatment showing 75% relief, which was statistically moderately significant (*p*<0.01).
*Saruja mutrata* (Painful micturition):-  
The mean score of Saruja Mitrata was 1.28 before treatment and it reduced to 0.28 after treatment. The relief in percentage was 77.77%, which was statistically moderately significant. (*p*<0.01).
*Krichhra mutrata* (Difficulty in micturition)  
The mean score of Krichhra Mutrata was 2.17 before treatment and it reduced to 0.52 after treatment with 76.00% relief. The result was statistically highly significant (*p*<0.001).
*Muhur-Muhur Mutrata* (Increased frequency of micturition)  
The mean score of Muhur-Muhur Mutrata was 1.65 before treatment and it reduced to 0.42 after treatment with 74.41% relief. The result was highly significant statistically (*p*<0.001).
Effects of the therapy on urine test finding

Pus cells
The mean score of pus cells in urine was 1.46 before treatment and after treatment came down to 0.38 giving relief of 73.68%. The result was highly significant statistically (p<0.001).

RBC’s
The mean score of RBC’s in urine was 1.60 before treatment and it reduced to 0.40 after treatment with 75.00% relief. The result was moderately significant statistically (p<0.01).

Protein
The mean score of Protein was 1.15 before treatment and it reduced to 0.38 after treatment, giving 66.66% relief, which was statistically highly significant (p<0.001).

Ph- Before the trial maximum patients were having urine reaction as acidic but after the trial urine reaction of 23 patients was acidic, 3 patients was neutral.

Overall effects of the therapy
Table no 20

<table>
<thead>
<tr>
<th>Results</th>
<th>No. of patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cured</td>
<td>9</td>
<td>34.61%</td>
</tr>
<tr>
<td>Markedly improved</td>
<td>6</td>
<td>23.07%</td>
</tr>
<tr>
<td>Mildly improved</td>
<td>9</td>
<td>34.61%</td>
</tr>
<tr>
<td>Unchanged</td>
<td>2</td>
<td>7.69%</td>
</tr>
</tbody>
</table>

DISCUSSION

Pittaja Mutrakrichha have been studied on scientific grounds along with symptomatic UTIs. Inspite of the fact, that there are so many recent advances being seen in understanding the pathogenesis and symptomatology of UTI, it remains a common health problem in all age groups. Especially, it affects the females of all ages and males at extremes of life. Patients with structural and functional abnormalities are also at the edge of this risk.

Infections result from a variety of micro-organisms and cause distressing symptoms, frequent morbidity and a significant mortality. All forms of UTIs start as a minor ailment but they have a tendency to reoccur and relapse. Therefore, repeated lower urinary tract infection leads to upper UTIs due to ascending involvement. Progressive pyelonephritis is a common outcome of chronic UTIs and if it is not treated well in time, it causes irreversible damage to the kidney leading to CRF. Thus, a UTI that may appear as a minor problem in the beginning has all the potential of leading to morbid renal disease, ultimately leading to death. There is a need of advancements in preventive nephrology in order to maintain good renal functions and eradication of infection, as prevention is better than cure.

Taking all these facts into consideration that there are large number of anti-biotics and urinary anti-septics available in modern medicine but they have their own limitations, therefore, it has been often suggested to explore the different plants and other natural resources. These drugs are easily available safe and free from side effects. Keeping into consideration, all these facts, present trial was conducted with some Ayurvedic drugs, out of bulk of drugs mentioned in Ayurvedic literature. So, present study was carried out with the formulation described in Bhaishaja Ratnavali in Mutrakrichha Chikitsa Prakarna i.e. “Dhatryadi Kwatha”, which consists of Amalaki, Draksha, Vidari, Madhuyasthi and Gokshura. All the drugs were taken in equal parts. These drugs may eradicate the infection as well as improve the functions of kidney.

Discussion on demographic data

Age:- In the present clinical trial of 26 patients, majority of patients were reported in the age group of 21 to 30 i.e. 46.15 %.

Sex:- Majority of the patients i.e 92.30% belonged to female sex and 7.69% are male. There is peculiarity of female uro-genital anatomy

Religion:- All the patients belonged to Hindu community.

Marital status:- In this clinical trial, 88.46% of the patients were married due to increased sexual activity

Habitat:-All the patients registered under clinical trial belonged to rural area due to the geographical location of the hospital in rural area.

Occupation:- There is pre-dominance of housewives i.e. 46.15% in the present clinical data.
Education:- Most of the patients in the present study were primary educated (50%).

Socio-Economic status:- In the present clinical trial, 61.53% of the patients came from middle class. It shows that disease is more prevalent in lower class and middle class. So, it can be concluded from the data that poverty, illiteracy, lack of awareness and poor personal hygiene are the main contributing factors for the increased incidence of Mutrarichha. Use of Raksha food and hectic life styles are mentioned as the etiological factors for Mutrarikrichha in Ayurvedic classics. These are found in lower socio-economic class and uneducated or less educated people. These are the aggravating factors in the progression of the disease and hence affects immune status i.e. Oja Kshaya.

Dietary habit:- Most of the patients in the present study were consuming mixed diet (57.69%).

Life Style:- In present study, most of the patients (53.84%) were hard working as compared to patients having sedentary habits (46.16%).

Addiction:- In the current clinical trial, majority i.e. 92.30% of the patients were not having any type of addiction.

Hygiene:- 46.15% of the patients presented with medium personal hygiene.

Sleep:- The sleep of patients in this study was found disturbed in 26.92% of patients while rest of the patients (73.07%) had normal sleep.

Deha prakriti:- In the present study, 46.15% of the patients were of Vata Pittaja prakriti followed by Pitta kaphaja prakriti (38.46%) and Vata Kaphaja prakriti (15.80%). According to Ayurvedic principles, Deha Prakriti plays an important role in the manifestation of disorders.

Discussion on clinical study

Clinical features:- Muhur-Muhur Mutrata was present in 100% of the patients, Sadaha Mutrata in 88.46 patients, Krichha Mutrata in 76.92% patients and Saraja Mutrata in 26.92% patients, Peeta/Shweta Mutrata in 50% patients and Sarakta Mutrata was present in 19.23% of the patients.

Constitutional features:- The fever was present in most of the patients i.e. 34.62%. This may be due to infection in lower urinary tract. Anorexia in 23.07% and constipation in 15.38% of patients present in 7.69% of patients. Urgency was observed in 7.69% patients which may be due to cystitis or urethritis.

Urine analysis:- Urine reaction was acidic in all 100% patients. Pus cells were present in 100% patients and RBC’s were seen in 19.23% patients. 50% patients had proteinuria where proteins are found in traces in most of them. Proteinuria may be due to fever. Majority of the patients had increased urine output or normal i.e. within range of 1-2 lts in 24 hrs. There was no patient who had urine output <1 litre in 24 hrs. Urine culture was positive in all 1.e. 26 patients due to presence of bacteriuria.

Microbiological findings:- Majority i.e. 73.07% of the patients were found to be infected with Escherichia coli followed by 15.38% infected with Staphylococcus. E.Coli and Staphylococcus were seen in 7.69% of patients and Gram negative Coccobacilli were seen in 3.84% of the patients. Therefore, E. coli was found to be the main infecting organism. This data is in accordance with the modern textual references of U.T.I.

Blood analysis:- In present clinical trial, leucocytosis was not observed in any patient while 80.76% patients had raised ESR due to presence of infection. Renal functions including Blood urea and Serum creatinine were within the normal range before and after the treatment.

Discussion on effects of the therapy

Effects on urine culture findings:- Urine culture was positive in 26 patients, which reduced by 69.56% of the patients giving highly significant results statistically i.e. p<0.001.

Effects on urine microscopic findings:- Urine microscopic findings, pus cells were reduced by 73.68% which was highly significant statistically p<0.001. This may be due to flushing and bactericidal effects of drugs. The RBC’s in urine were reduced by 75.00% which was moderately significant statistically p<0.01. This may be due to anti-inflammatory effect of the trial drug. Proteinuria is reduced by 66.66% and showed highly significant results i.e. p<0.01.

Effects on urine microscopic findings:- Urine culture was positive in 26 patients, which reduced by 69.56% of the patients giving highly significant results statistically i.e. p<0.001 which may be due to antibacterial activity of drug against E.Coli and staphylococci which are main culprit organisms cause.

Discussion on overall effect of therapy

In the present clinical study, out of 30 patients; 26 completed the trial. The effects of the trial drug “Dhatryadi Kwatha” in recommended dose is evaluated over them. The overall results of the therapy were very encouraging as out of 26 patients, 34.61% patients were cured, 23.07% patients were markedly improved and 34.61% patients were mildly improved.

CONCLUSION

On the basis of this study, it can be concluded that trial drug, Dhatryadi Kwatha is having appreciable in the
mangement of *Pitta* *Mutrakrichhta* with no reoccurrence of disease. No untoward effects are seen during the trail.

**REFERENCES**


