



**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 inflammation 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 mangament. In the present study minimum of 30 patients diagnosed on the symptomatic criteria, urine culture positive, were give *Dhattryadi Kwatha* irrespective of caste, religion & socio economic status. The duration of trail was 14 days. The observations obtained are analysed statistically and is observed that *Dhattryadi kwatha* is a effective drug for *Mutrakrichha*.

KEYWORDS: *Mutrakrichha, Mutravaha srotasa, 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-Aprvrtijanya* and *Mutra-Atiprvrtijanya* disorders. *Mutrakrichha* comes under *Mutra-Aprvrtijanya* disorders.^[1] *Krichhhta* and *Vibandhata* are the chief complaints present in *Mutrakrichha* but *others* has cleared this controversy by citing that both the features are found in *Mutrakrichha* but *Krichhhta* predominates.^[3]

Therefore, it can be eluded that *Mutrakrichha* is a disorder of *Mutravaha Srotas*, which includes those forms of urinary disorders where *Krichhhta* is the cardinal feature. In the *Pittaja Mutrakrichha*, the vitiated *Pitta Dosa* along with *Vata* i.e. *Apana Vayu* on reaching the *Vasti* afflicts the *Mutravaha Srotas* due to which the patient feels *Krchra Mutrata*, *Peeta Mutrata*, *Sarakta Mutrata*, *Sadaha Mutrata*, *Saruja Mutrata* and *Muhur-Muhur Mutrata*.^[2,5] According to modern point of view Urinary Tract Infection may be subdivided in to upper

Urinary Tract Infection (i.e. Pyelonephritis, Prostitis, Perinephric abscess) and lower Urinary Tract Infection (i.e. Urethritis and Cystitis).^[10,12] 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**".^[8,9] 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 trail 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 Mutrakrichh a* 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 Mutrakrichhra*, 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)^[4]

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.

I. Urine analysis

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

II. Urine culture

Urine culture was done in every case. Only urine culture positive patients were included in the clinical trial. The urine culture was done in the deptt. Of Rog Nidan of R.G.Govt.P.G.Ayu. Hospital, Paprola, Distt- Kangra (H.P.).

III. 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.

IV. 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.

V. 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.
4. Complicating urinary calculi.
5. Diabetic and immuno compromised patients.
6. Case of obstructive uropathy such as BPH etc.
7. Polycystic Kidney.
8. Malignancy/tuberculosis of urinary tract.

Consent of the patients

All patients selected for trial were, explained the nature of study and their written consent was, obtained on the

consent form attached with the proforma, before the commencement of the clinical trial.

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*^[6] and *Dashvidha Pariksha* were also, carried out. In every case, the probable pathogenesis was, explored depicting all the *Samprapti Ghataks*.

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 Department 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. Patients were told to boil the given churna in 16 times water in a utensil without lid, until 1/8 of it remains. Remaining 1/8th was used as decoction for single dose

Dose

The registered patients were given the trial drug i.e. Dhattriyadi Kwatha in dose of 50 ml BD.^[9]

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.

- High fluid intake, at least 3 liters a day.
- Fruits containing high water content e.g. coconut.
- Use of *Takra* and curd.
- Maintenance of perineal hygiene.
- Complete and frequent emptying of the bladder.
- Voiding before and after coitus.

Apathya: The dietary & behavioral schedule prohibited to the patients.

- Low intake of water.
- Poor personal hygiene.
- Over indulgence in sexual activity.
- Suppression of the urge of micturition.
- 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 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 Mutrata* (Haematuria)

No RBC /HPF in the urine	0
RBC 1+/HPF in the urine	1
RBC 2+/HPF in the urine	2
RBC 3+/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	0
Bacterial count up to 10^5	1
Bacterial count 10^6 to 10^{10}	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 15days, 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
- b. Markedly improved
- c. Mildly improved
- d. Unchanged

This categorization was done, on the basis of, six cardinal symptoms of *Pittaja Mutrakrichhra* vis-à-vis urinary tract infection i.e. *Peeta mutrata* (turbidity of urine), *Sarakta mutrata* (haematuria), *Saruja mutrata* (painful micturition), *Sadaha mutrata* (burning micturition), *Krichha mutrata* (difficulty in passing urine) and *Muhur-muhur mutrata* (increased frequency of micturition) and the objective criteria including laboratory investigations i.e. urine microscopy and urine culture.

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 of 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 insignificant.

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 Mutrakrichhra* (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.

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.

1. Age

Table no. 1: Age wise distribution of 26 patients.

Age in year	No of patients	Percentage
16-20	1	3.84
21-30	12	46.15
31-40	11	42.30
41-50	0	0
51-60	2	7.69
61-70	0	0

2. Sex

Table No. 2: Sex wise distribution of 26 patients.

Sex	No of patients	Percentage
Male	2	7.69
Female	24	92.30

3. Religion

Table no. 3: Religion wise distribution of 26 patients.

Religion	No of patients	Percentage
Hindu	26	100%

4. Marital status

Table No. 4: Marital status wise distribution of 26 patients.

Marital status	No of patients	Percentage
Married	23	88.46%
Unmarried	3	11.54%

5. Habitat

Table No. 5: Habitat wise distribution of 26 patients.

Habitat	No of patients	Percentage
Rural	26	100%

6. Occupation- Occupation wise distribution of 26 patients.

Table no. 6

Occupation	No of patients	Percentage
House wives	12	46.15
Students	2	7.69
Employee	4	15.38
Farmer	8	30.76

7. Education

Table no. 7: Education wise distribution of 26 patients.

Education	No. of patients	Percentage
Uneducated	2	7.69%
Primary	13	50%
Matric	9	34.61%
Graduate	2	7.69%

8. Socio-Economic status**Table no. 8: Socio economic status wise distribution of 26 Patients**

Socio economic status	No. of patients	Percentage
Lower	10	38.46
Middle	16	61.53

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

Diet	No. of patients	Percentage
Mixed	14	53.44
Vegetarian	12	46.16

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

Life style	No. of patients	Percentage
Hard Working	14	53.84%
Sedentary	12	46.16%

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

Addiction	No. of Patients	Percentage
Smoking & Alcohol	2	7.69
No addiction	24	84.62%

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

Hygiene	No. of patients	Percentage
Good	4	15.38
Medium	12	46.15
Poor	10	38.46

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

Sleep	No. of Patients	Percentage
Normal	19	73.07
Disturbed	7	26.92

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

Deha prakriti	No. of patients	Percentage
Vata Pittaja	12	46.15
Vata Kaphaja	4	15.38
Pitta Kaphaja	10	38.46

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

Clinical features	No. of Patients	Percentage
Sadaha mutrata	23	88.46
Saruja mutrata	7	26.92
Krichhra mutrata	20	76.92
Muhur-muhur mutrata	26	100
Peeta mutrata	13	50
Sarakta mutrata	5	19.23

16. Constitutional features**Table no. 16: Constitutional features observed in 26 patients of *pittaja mutra krichhra*.**

Constitutional features	No. of patients	Percentage
Fever	9	34.62
Hesitancy	3	11.53
Stranguary	0	0
Urgency	2	7.69
Anorexia	6	23.07
Constipation	4	15.38
Retention of urine	0	0

17. Urine analysis**Table no. 17: Urine analysis findings observed in 26 patients of *pittaja mutra krichhra*.**

Urine analysis finding	No. of patients	Percentage
Pus cells	26	100
RBC'S	5	19.23
Urine proteins	13	50
Urine Reaction (acidic)	26	100
Positive urine culture	26	100
Urine volume <1liter/24 hours	0	0

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

Micro-organism	No. of Patients	Percentage
E. Coli	19	73.07
Staphylococcus	4	15.38
E. Coli & Staphylococcus	2	7.69
Gram -ve Cocco bacilli	1	3.84

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

Blood analysis finding	No. of patients	Percentage
Leucocytosis	1	3.84%
Raised ESR	17	65.38%

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 Mutrata* 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. ($p < 0.01$).

Sadaha Mutrata (Burning micturition):- The mean score of *Sadaha Mutrata* was 2.17 before treatment and it reduced to 0.52 after treatment with 76.00% relief. The result was statistically highly significant ($p < .001$).

***Krichhra mutrata* (Difficulty in micturition)**

The mean score of *Krichhra Mutrata* was 1.45 before treatment and it reduced to 0.30 after treatment with 79.31% relief. The result was statistically highly significant ($p < .001$).

***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 ($p < .001$).

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**

Results	No. of patients	Percentage
Cured	9	34.61%
Markedly improved	6	23.07%
Mildly improved	9	34.61%
Unchanged	2	7.69%

DISCUSSION

Pittaja Mutrakrichha have been studied on scientific grounds along with symptomatic UTIs. In spite 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

Effects of the therapy on urine culture finding

The mean score of urine culture positive patients was 1.76 before treatment and came down to 0.53 after treatment giving relief of 69.56%. The result was highly significant statistically ($p < 0.001$).

Effects of the therapy on haematological parameters:- TLC

The initial mean score of TLC was 7827.27 before treatment, which came down to 7390.91 after treatment with 5.51% reduction. The result was statistically highly significant ($p < 0.001$).

ESR

The initial mean score of ESR was 25 before treatment, which came down to 14.04 after treatment with 43.84% of relief. The result was statistically highly significant ($p < 0.001$).

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 *Bhaishajya Ratnawali* 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 *Mutrakrichha*. Use of *Ruksha* food and hectic life styles are mentioned as the etiological factors for *Mutrakrichha* 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 *Saruja 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 3.70% 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 1-2lts 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 *Cocci* 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 clinical features

The effects of the therapy on *Muhurmuhur*, *Sadaha*, *Krichra*, *Peeta/ Shweta Mutrata* were relieved showing percentage relief of 74.41%, 76.00%, 79.31%, 66.66 respectively and showed highly significant results, statistically i.e. $p < 0.001$ each. *Saruja Mutrata*, *Sarakta Mutra*, were relieved by 77.77%, 75.00% respectively and showed moderately significant results i.e. $p < 0.01$. Relief in these symptoms may be due to effect of the trial drugs which exhibit anti bacterial, anti inflammatory, anti septic, analgesic and above all diuretic properties.

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

Effects on hematological finding- Though, all the patients were subjected to haematological investigations like Hbmg%, TLC, DLC, FBS, Blood urea and Serum creatinine but there was no difference before and after the treatment. ESR came down by 43.84% and TLC came down by 5.57% which shows relief in infection.

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 *Pittaj Mutrakrichhta* with no reoccurrence of disease. No untoward effects are seen during the trail.

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