Research Article

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A CLINICAL STUDY TO EVALUATE THE EFFICACY OF AN AYURVEDIC FORMULATION IN MANAGEMENT OF PITTAJA MUTRAKRICHHRA WITH SPECIAL REFERENCE TO URINARY TRACT INFECTION

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ABSTRACT

The term Mutrakrichhra is the disorder of Mutravaha Srotasa where Krichhrata (painful voiding) is the cardinal feature. In Pittaja Mutrakrichhra, the vitiated Pitta Dosha along with Vata (mainly Apana Vayu) on reaching Vasti (bladder) afflicts the Mutravaha Srotas due to which the patient feels difficulty in micturition, yellow discoloration, hematuria, burning micturition, dysuria and increased frequency of micturition. These symptoms resembles with lower urinary tract infections i.e. urethritis and cystitis which is a serious problem as patient if remain ignorant and untreated; this may lead to chronic renal failure and pyelonephritis. Antibiotics has solved the problem to some extent but the increasing incidence of resistance, side effects, reoccurrence and relapse of the disease and high cost of therapy are common problems. Hence the trial was, undertaken to come forward with safe, cost effective and efficacious Ayurvedic formulation for its management. In the present study, 26 clinically diagnosed, urine culture positive patients were given Mutrakrichhra-hara yoga and Gokshura *(Tribulus terrestris)* Kvatha for duration of 15 days. Patients were thoroughly assessed on various scientific parameters during the complete trial period and after one month of completion of the trial for reoccurrence of infection. A statistically highly significant ($p < 0.001$) improvement was observed in all the clinical features after the therapy. Objective parameters like urine microscopic study, urine culture and hematological parameters were also statistically highly significant ($p < 0.001$) improved after the therapy. No untoward effects were noticed during the treatment and follow up period.

Keywords: Mutrakrichhra, Urinary tract infection

INTRODUCTION

The term Mutrakrichhra comes under the disorders of Mutravaha Srotas which includes those forms of urinary disorders where Krichhrata (painful voiding) is the cardinal feature[1]. Adhyashana (overeating), Ajirna (indigestion), excessive intake of alcohol, Ruksha food, strong medications, Javara (fever), Kamla (jaundice), Vasti Vidradhi (bladder abscess), excessive exercise, journey on fast moving vehicles, excessive horse riding, over indulgence in sexual activity and other traumas are the various causes of mutrakrichhra[2]. Acharya Charaka has classified Mutrakrichhra into eight types viz. Vataja, Pittaja, Kaphaja, Sannipataja, Ashmarija, Sharkaraja, Shukraj and Raktaj[3]. In Pittaja Mutrakrichhra, the vitiated Pitta Dosha along with Vata (mainly Apana Vayu) on reaching Vasti (bladder) afflicts the Mutravaha Srotas due to which the patient feels difficulty in micturition[4] along with symptoms like Peeta mutrata (yellow discoloration of urine), Sarakta mutrata (hematuria), Sadaha mutrata (burning micturition), Saruja mutrata (dysuria) and Muhur-muhur mutrata (increased frequency of micturition)[5]. These symptoms of Pittaja Mutrakrichhra resembles with lower urinary tract infections i.e. urethritis and cystitis. 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.

A healthy and normal urinary tract is generally resistant to infections. However, for anatomical reasons female lower urinary tract is more susceptible to infections. In at least 50% of the patients, a predisposing factor cannot be demonstrated in spite of adequate investigation.

Urinary tract infections are the common complications during pregnancy, in diabetes patients, in polycystic renal disease, in renal transplantation and in other immuno- compromised patients having polycystic renal disease and other structural and functional pathologies are also at high risk. Urinary tract infections are the leading cause of gram-negative sepsis in hospitalized patients. About half of the hospital-acquired infections originate in urinary tract in association with urinary catheters and urological procedures[6].

Thus, urinary tract infection is a serious problem as patient if remain ignorant and untreated, this may lead to chronic renal failure and pyelonephritis. Antibiotics has solved the problem to some extent but the increasing incidence of resistance, side effects, reoccurrence and relapse of the disease and high cost of therapy are common problems[6].

In view of above facts the present trial was, undertaken to understand the Ayurvedic concept of Mutrakrichhra, along with study of the profile of urinary tract infections and come forward with safe, cost effective and efficacious Ayurvedic formulation (Mutrakrichhrahar yoga with Gokshura Kvath) for its management.

MATERIALS AND METHODS

Ghansatva[7] of Darbh (*Imperata cylindrica*), Kakodumbra *(Ficus hispida*) & Shveta Punarnava (*Trianthema portulacastrum*), each 1 part were combined in equal proportion with Shudh Shilajatu (*Asphaltum punjabinum*) and filled up in capsules

weighing 500 mg each. Gokshura (*Tribulus terrestris*) Kvatha was prepared as per classical texts[8]. Finished trial drugs were further tested in the state government drug-testing laboratory, Joginder Nagar, to come forward with safe, cost effective, qualitative and efficacious *Ayurvedic* formulation for management of Mutrakrichhra (UTI).

Selection of patients

Patients of Pittaja Mutrakrichhra, fulfilling the inclusion criteria and the age group between 16 to 70 years irrespective of sex, caste and religion, after written informed consent were registered from the OPD/IPD of R.G. Govt. P.G.Ayu. Hospital, Paprola, Distt. Kangra (H.P.).

Inclusion criteria

a. Subjective Criteria

Pitta mutrata (Turbidity of urine), Sarakta mutrata (Haematuria), Saruja mutrata (Painful micturition), Sadaha mutrata (Burning micturition), Krichhra mutrata (Difficulty in micturition), Muhur-muhur mutrata (Increased frequency of micturition)

b. Objective Criteria

Only culture positive patients were included in the trial group.

Investigations

- Complete Urine Analysis: Colour and appearance, reaction, specific Gravity, urinary volume in 24 hours, sugar, protein, pus cells, RBC's, WBC's, casts, crystals
- Urine Culture: - Only urine culture positive patients were included in the clinical trial.
- Hematological Investigations: Such as Hb gm/dl, TLC, DLC, ESR
- Biochemical investigations: Blood urea, S.Cr., blood sugar
- Radiological Investigations: USG (KUB) & Plain X- ray abdomen

Exclusion Criteria

- Patients not willing for trial.
- Patients below 16 years and above 70 years of age.
- Patients with impaired renal function.
- Complicating urinary calculi.
- Diabetic and immune compromised patients.
- Case of obstructive uropathy such as BPH etc.
- Polycystic Kidney.
- Malignancy/tuberculosis of urinary tract.

Study design

Single trial group wag given- Mutrakrichhrahara yoga - 1gm TID with plain water.

Gokshura Kvatha - 50ml twice a day.

Duration of trial: - 15 days.

Follow up of patients- weekly after commencement of therapy to completion of the trial and after one month of completion of the trial.

Instructions to the patients

Pathya: high fluid intake, maintenance of personal hygiene, complete and frequent emptying of the bladder, voiding before and after coitus.

Apathya: low fluid intake, poor personal hygiene, over indulgence in sexual activity, suppression of the urge of micturition, use of spermicides and diaphragms.

Assessment of the patients

In first follow up, the patients were assessed on clinical grounds only, final detailed examination, including all investigations was done after completion of trial. Various symptoms of Pittaja Mutrakrichhra and urinary tract infection were accorded grades from 0 to 3 according to severity. Urine culture reports were, compared with that of done before and after completion of clinical trial.

Table 1: Overall assessments of result of the study

Sr. No.	Overall effects of the therapy	
1	Cured	100% relief in symptoms & signs with a negative urine culture
2	Markedly improved	>75% relief in symptoms & signs with a negative urine culture
3	Mildly improved	>50% relief in symptoms & signs but urine culture remained positive
4	Unchanged	<25% relief in symptoms & signs and urine culture remained positive

OBSERVATIONS

A total 26 patients were registered but 22 patients completed the trial and 4 patients failed to complete the trial were considered drop out. Demographic observations were made on 26 patients and effects of therapy were carried out in 22 patients.

Majority of patients (46.16%) belonged to 21to 30 years age group with female predominance (84.62%.Majority were married (54.54%). Sadaha mutrata was present in all the 26 registered patients (100%). Muhur-muhur mutrata and Saruja mutrata were present in 96.15% and 92.3% of the patients respectively. Krichhra mutrata was observed in 84.62% of patients and Peeta mutrata was observed in 38.46% of patients where as Sarakta mutrata was observed only in 26.92% of patients. Pus cells were presents in 92.3% of patients. RBC's were observed in 38.46%. No reoccurrence of the disease was observed in any patient after one month of completion of trial.

RESULTS

Table 2: Effects of the therapy on clinical features

Clinical features	N	Mean score		Difference	Percentage relief	S.D+	S.E+	T	P
		BT	AT						
Peeta mutrata	9	1.22	0	1.22	100%	0.44	0.14	8.71	<0.001
Sarakta mutrata	7	1.28	0	1.28	100%	0.48	0.18	7.11	<0.001
Saruja mutrata	21	1.38	0.28	1.1	79.71%	0.30	0.06	18.16	<0.001
Sadaha mutrata	22	1.59	0.18	1.41	88.67%	0.51	0.11	12.72	<0.001
Krichhra mutrata	20	1.35	0.3	1.05	77.77%	0.22	0.04	26.25	<0.001
Muhur-muhur mutrata	22	1.32	0.27	1.05	79.54%	0.38	0.08	13	<0.001

BT: Before Treatment, AT: After Treatment

Table 3: Effects of the therapy on urine microscopic finding

Variables	N	Mean Score		Difference	Percentage relief	S.D+	S.E+	T	P
		BT	AT						
Pus cells	21	1.19	0.28	0.91	76.47%	0.43	0.09	10.11	<.001
RBC'S	8	1.13	0.12	1.01	89.38%	0.53	0.18	5.55	<.001

BT: Before Treatment, AT: After Treatment

Table 4: Effects of the therapy on urine culture finding

Variables	N	Mean Score		Difference	Percentage relief	S.D+	S.E+	T	P
		BT	AT						
Urine culture	22	1	0.45	0.55	55%	0.51	0.11	4.9	<.001

BT: Before Treatment, AT: After Treatment

Table 5: Effects of the therapy on haematological parameters

Variables	Mean score		Difference	Percentage relief	S.D +	S.E +	t	P
	BT	AT						
TLC	7827.27	7390.91	436.36	5.57%	544.79	116.15	4.14	<.001
ESR	25	14.04	10.96	43.84%	13.15	2.80	3.91	<.001

BT: Before Treatment, AT: After Treatment

Table 6: Overall effects of the therapy

Results	No. of patients	Percentage
Cured	9	40.9%
Markedly improved	3	13.63%
Mildly improved	8	36.36%
Unchanged	2	9.09%

DISCUSSION

Peeta mutrata (yellow discoloration) and Sarakta mutrata (hamaturia) were relieved by100% which was statistically highly significant result (p<0.001). Saruja mutrata (dysuria) was relieved by 79.71%, which was also statistically highly significant. Sadaha mutrata (burning micturition) was also drastically relieved to the extent of 88.67%, which was also highly significant statistically (p<0.001). Relief in Krichhra mutrata (difficulty in passing urine) and Muhur-muhur mutrata (increased frequency of micturition) were 77.77% 79.54% respectively. Improvement in both the features was highly significant statistically (p<0.001). The statistically highly significant improvement in various clinical features was probably because of Pitta- Vata shamaka, antibacterial, anti-inflammatory, antiseptic, analgesic, diuretic and alkalizer properties of the trial drugs.

In urine microscopic findings the pus cells in urine were reduced by 76.47%. Reduction in urine pus cells was highly significant statistically (p<0.001). The RBC's in urine were decreased by 89.38% which was also highly significant statistically (p<0.001).

Urine culture was positive in all the patients before commencement of the therapy, which became negative in twelve patients by giving 55% of relief. The result was highly significant statistically (p<0.001).

In this clinical study, total 22 patients completed the trial. The effects of Mutrakrichhra- hara yoga were, evaluated over them. The overall effects of the therapy were encouraging as out of 22 patients, 40.9% patients were cured, 13.63% patients were markedly improved, 36.36% patients were mildly improved and 9.09% patients remained unchanged.

The main causative factor in Pittaja Mutrakrichhra is vitiation of Pitta dosha, which requires being pacified. Vasti is the seat of Vata and the act of micturition is under the control of Apana Vayu. In Ayurveda, this disease is considered as Pittaj Vikara and other factors, which are involved in the pathogenesis, are Apana Vayu, Mutra and Mutra Vaha Srotas. Therefore, while selecting the drugs for present trial preference was given to the drugs having Pitta Shamaka as well as Vata Shamaka properties along with Mutra Virechaniya and Vedna Shamaka action.

In Ayurvedic Classics, Gokshura has been described in Mutra Virechniya Gana. Due to its Madhur Rasa, Guru, Snigdha, Sheet properties[9], Gokshura alleviates both vitiated Pitta and Vata Doshas, which are primarily involved in the pathogenesis of Pittaja Mutrakrichhra. Its main action is to inhibit reabsorption of urine from the renal tubules leading to diuresis. By virtue of its diuretic action, it keeps the urinary tract flushed and helps in eradicating the culprit pathogens. In addition to this, it also possesses anti-inflammatory and antibacterial properties[10], which help in controlling both inflammation and infection. Animal experimentation has proved that water-soluble extract of Gokshura *(Tribulus terrestris)* possesses antibacterial properties and especially active against E.coli & Staphylococcus which are the most common culprit organisms in urinary tract infection[11].

In Ayurvedic literature, Shilajatu (*Asphaltum punjabinum)* has been, described as Tridoshaghna and Rasayana drug[12]. It has Tikta, Kashaya Rasa and Sheeta Virya[13]. By virtue of these two properties, it pacifies vitiated Pitta Dosha therefore breaks the pathogenesis of Pittaja Mutrakrichhra. It also possesses anti-inflammatory, antibacterial and diuretic properties[14], which help in eradicating urinary tract infections.

Shveta Punarnava (*Trianthema portulacastrum)* possesses Tikta, Kashaya, Katu & Madhura Rasa, Laghu & Ruksha Guna, Ushana Virya and Katu Vipaka[15]. By virtue of its Madhura Rasa and Ushana Virya, it helps in alleviating vitiated Vata Dosha. It also possesses analgesic, anti-inflammatory and diuretic properties[16], which help in providing symptomatic relief in urinary tract infection.

In Ayurvedic literature, Darbha *(Imperata cylindrica*) has been described as Tridosha Shamaka Aushdha. It has Madhura Rasa, Snigdha & Laghu Guna and Madhura Vipaka[17], which help in relieving vitiated Vata Dosha. By virtue of, its Sheet Virya, it also pacifies vitiated Pitta Dosha. It also possesses antibacterial and diuretic properties. It has specific antibacterial action against Staphylococcus aureus[18], which is one of the commonest culprit organisms in UTI. Kakodumbra *(Ficus hispida*) possesses Guru Guna and Madhura Vipaka. By virtue of these two properties, it helps in pacifying morbid Vata Dosha, and by virtue of Sheet Virya and Tikta & Kashaya Rasa it also takes care of vitiated Pitta Dosha[19]. It is also documented to possess antispasmodic and anti-inflammatory properties[20], which alleviate inflammatory pathologies of urinary tract and relieves the symptomatology of Mutrakrichhra.

CONCLUSION

On the basis of this study, it can be concluded that trial drug, 'Mutrakrichhra-hara- yoga and Gokshura Kvatha is very effective in the management of Pittaja Mutrakrichhra (UTI) with no reoccurrence of the disease. No untoward effects of the drugs were noted during the trial and follow up period.

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