

Management of Urolithiasis (Mutrashmari) by an Ayurvedic Preparation *VarunaMulatwak Kashaya*

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Abstract

Introduction: In the present study an effort was made to evaluate the efficacy of *Varunamulatwak kashaya* (decoction of *Crataeva nurvala* rootbark and *Moringa oleifera* bark). The main aim of this particular study was inclined towards the disintegration, dissolution, dislodgement and expulsion of renal stones. These drugs are easily available, economical and are easy to administer, which are having anti-inflammatory, diuretic and Antilithic properties. Total 30 patients were selected randomly and were divided into two groups i.e. Group-I and Group-II each group contains 15 patients. Group-I: This group was treated with *Varunamulatwak kwatha* in a dose of 45 ml, twice daily, after food for a period of 45 days. Group-II: This group was treated with Flush out therapy (hydro therapy). After completion of the study with *Varunamulatwak Kashaya* for 45 days, the results were encouraging. The efficacy of *Varunamulatwak kashaya* in relief of Pain (76%), Haematuria (83%), Dysuria (76%), Size of calculi (74%) and Number of calculi (68.7%) was highly significant. Hence it was concluded that traditional ayurvedic management is effective and have no adverse effects on the patients of Urolithiasis.

Keywords: Mutrashmari; Urolithiasis; *Varunamulatwak kashaya*; *Crataeva nurvala*

Introduction

Urinary stone constitute one of the commonest diseases in our country and pain due to kidney stones is known as worse than that of labour pain. Among all the pain, abdominal pain always draws not only patient's attention but also the curiosity of the surgeon. The information regarding *Ashmari* [1,2] is available in almost all *samhita* (Ancient treatise) of Ayurveda. In India, approximately 5-7 million patients suffer from stone disease [3,4] and at least 1/1000 of Indian population needs hospitalization due to kidney stone disease. Thus, the disease is as widespread as it is old, particularly in countries with dry, hot climate [5]. These are "stone belt regions". The incidence of calculi varies as per geographical distribution, sex and age group. The recurrence rate is 50 to 80%. Males are more frequently affected than the female and their ratio is 4:3 [6]. The incidence is still higher in the age group between 30-45 years and incidence declines after age of 50.

In *Ayurveda* numbers of drugs are mentioned to treat *mutrashmari* [5]. Among them the '*Varunamulatwak kwatha*', which is mentioned in *Chakradatta* text 34/25 [7], was selected for the study. This compound drug is advised in decoction form. This drug can be given on O.P.D basis and is administered without requiring hospitalization. These drugs are easily available, economical and are easy to administer. These are also using since ancient period traditionally. These are having anti-inflammatory [8], diuretic and Antilithic [9] properties. Hence the clinical study has been undertaken to evaluate the efficacy of '*Varunamulatwak kwatha*' in the management of Urolithiasis.

Aims and objectives of the study were:

- To evaluate therapeutic effect of *Varunamulatwak kwatha* in *Mutrashmari*.
- To know the efficacy of the conservative medical treatment.

Materials and Methods

The present clinical study was a single blind clinical study where 30 patients were selected by random sampling procedure, attending the OPD (Out Patient Department) of NKJ Ayurvedic Medical College and Hospital, Bidar, Karnataka. The selection of cases was done on the bases

of clinical presentation and the diagnosis was established accordingly. The selected patients were divided into two groups, 15 in each.

Group-A (Trail group): This group was treated with *Varunamulatwak kwatha* in a dose of 45 ml, twice daily, after food for a period of 45 days.

Group-B (Control group): This group was treated with oral fluid intake if patient unable to take orally then flush out therapy (hydro therapy).

Patients of both the groups were advised for a follow up on every Fifteen days (2 weeks) for 3 times, during treatment. The patient was advised to drink 3-4 litres of water per day and to consume suitable diet with proper sleep and excretion of natural urges. Patients were advised to avoid milk, tomato, cauliflower, spinach, fish and meat (incompatible diets and regimen) during the period of treatment [10].

Inclusion criteria

Patients were selected between 20 to 50 yrs age group, irrespective of sex, having calculi size less than 8 mm anywhere on KUB. Patient's those who were ready to give written consent.

Exclusion criteria

Patients with size of calculi greater than 8 mm, patients with systemic pathology and any acute urinary obstructive condition.

Diagnostic phase

The patients complaining of pain abdomen and other related

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symptoms like Dysuria, Haematuria and burning micturition were selected and all these patients were subjected to through general and systemic examination i.e. microscopic examination of urine, X-ray KUB and USG. After the diagnosis was confirmed the patients were registered for the clinical study.

Varunamulatwak kwatha

This is the drug used in the study. The ingredients of this yoga are *Varunamula twak* [11] + *Shigru mula* [11] + Water.

Preparation of Varunamulatwak kwatha

Varunamulatwak + *Shigru mula* ↓

Added 32 parts of water ↓

Boiled in *Mandagni*(low flame) ↓

Reduced for ¼ part ↓

Kwatha(decoction) is prepared ↓

(*Varunamula twak kwatha*)

Dosage: 45 ml of kwatha both the times is advice after meals for 45 days [12].

Flush out therapy

The procedure in which intravenous fluids are administered to the patient (in an attempt to flush them out). Intravenous fluid administration is a standard therapy for stones.

Materials: IV stand, IV set, scalp vein needle, spirit swab, adhesive plaster strips and IV Fluid bottle-NS 0.9%.

Procedure: The distal limb was compressed with hand in pumping motion to press the blood into the vein then the vein was palpated and cleaned with spirit swab. Then the vein was punctured with the scalp vein needle and the compressing hand was released and IV was connected, set to the Scalp vein needle. The regulating clamp was opened and the flow was adjusted to 20 drops/minute. The scalp vein needle was fixed securely with 3 to 4 adhesive strips.

Dosage: 2 L 0.9% saline over 4 hours.

Assessment phase

The patients were assessed on the basis of subjective and objective parameters before and after treatment.

A. Subjective criteria

- Pain abdomen
- Haematuria
- Dysuria

B. Objective criteria

- Size of stone
- Site of stone
- Number of the stone

Assessment criteria

Subjective criteria: Pain abdomen [13]: Pain was assessed by VAS (Visual Analogue Scale): In terms of sufferer it is Grade 0: Absence of pain/No pain; Grade I: 1 to 3 mark on scale (mild pain); Grade II: 4

to 6 mark on scale (moderate pain cannot be ignored, interferes with function, and needs treatment from time to time); Grade III: 7 to 10 mark on scale (severe-requires constant attention) [6].

Haematuria: was assessed by routine urine examination and presence and absence of RBC. Grade 0: Absence of RBC's in urine; Grade I: Presence of RBC's in urine; Grade II: More than 3-5 RBCs in urine; Grade III: More than 3-5 RBC.

Dysuria: was assessed by history of pain and radiation during micturition. Grade 0-Absence of pain during micturition; Grade 1-Mild pain during micturition; Grade 2-Moderate pain during micturition; Grade 3-Severe pain during micturition.

Objective criteria: Size of stone: was assessed by USG every week in mm. Grade 0 (good): More than 50% of decrease in size; Grade 1 (fair): In between 25% to 50% of decrease size; Grade 2 (poor): Less than 25% of decrease in size; Grade 3 (no response): No change in size.

Site of stone: was assessed under USG guidance and graded as follows. Grade 0: Expelled; Grade 1: Stone in bladder; Grade 2: Stone in ureter; Grade 3: Stone in renal pelvis.

PH of urine: was assessed by biochemical examination of urine.

Blood urea: was assessed by routine urine examination.

Serum creatinine: was assessed by routine urine examination.

X-ray KUB: was assessed before treatment and after treatment and was presented with Present (1) and Absent (0).

USG: was assessed before treatment and after treatment and was presented with Present (1) and Absent (0).

Assessment of result: For the purpose of the assessment of result we have used some grade points considering the severity of different sign and symptoms and clinical assessment of result of result was done as:- cure: 100% free from cardinal sign and symptoms (pain abdomen, haematuria, dysuria, site of stone and dislodgement). Maximum improvement: 75% to 99% improvement of the above mentioned cardinal sign and symptom. Moderate improvement: 50% to 75% improvement of the above mentioned cardinal sign and symptom. Mild improvement: 25% to 50% improvement of the above mentioned cardinal sign and symptom. No improvement: less than 25% improvement of the above mentioned cardinal sign and symptom.

Observations and Results

All the patients were advised to take similar dietary regimen. The duration of treatment was 45 days in maximum. The clinical assessment was done in every 15th day's interval. The initial finding through clinical, pathological and radiological statements were compared with the result of progressive 15th day, 30th day and 45th day and so on of investigations. Grading and grouping according to the assessment criteria concerned to each item categorically differentiated the findings among the patients in the clinical study. And finally the assessment as a whole was presented in percent value. In order to present the study in a scientific manner the statistical assessment of the result were assessed of result mean ± S.D of each sign and symptom before treatment was compared with mean ± S.D value of after treatment, *t*-test was used for the purpose of the test of significance the effectiveness *Varunamulatwak kwatha* and was assessed through p-value (Tables 1- 4) (Figure 1).

Discussion

From the present study it becomes evident that the urological

Observations	Predominance	Percentage
Age	30-39 and 40-49	33.33%
Sex	Male	73.33%
Religion	Hindu individuals	76.66%
Habitat	Urban area	66.66%
Marital status	Married	73.33%
Educational status	Higher secondary	43.33%
Socio-economic status	Lower Middle class	56.66%
Occupation	Service	43.33%
Dietary habits	Mixed	73.33%
Site of the Stone	Ureteric	50%

Table 1: Demographic observations of total registered patients.

Sign / symptom	Mean ± S.D		Df	p-value	t-value	Effectiveness %	Remark	
	BT	AT1						
Pain	2.14 ± 0.77	AT1	1.42 ± 0.51	14	<0.01	4.28	33%	HS
		AT2	0.85 ± 0.36		<0.01	5.1	60%	HS
		AT3	0.5 ± 0.51		<0.01	9.2	76%	HS
Haematuria	0.85 ± 0.36	AT1	0.35 ± 0.49	>0.01	2.8	58%	NS	
		AT2	0.28 ± 0.46	>0.01	3.2	66%	S	
		AT3	0.14 ± 0.36	<0.05	5.54	83%	HS	
Dysuria	1.5 ± 0.65	AT1	0.78 ± 0.80	<0.01	5.5	47.6%	HS	
		AT2	0.71 ± 0.72	<0.01	4.9	52.3%	HS	
		AT3	0.35 ± 0.49	<0.01	6.2	76.1%	HS	
Size of stone	4.42 ± 0.58	AT1	2.7 ± 1.8	<0.01	3.5	37%	HS	
		AT2	1.78 ± 1.62	<0.01	5.6	59%	HS	
		AT3	0.5 ± 0.6	<0.01	19.7	88%	HS	
Site of stone	22.2 ± 0.8	AT1	1.5 ± 0.8	<0.05	2.2	29%	S	
		AT2	1.07 ± 0.7	<0.05	3.6	51%	S	
		AT3	0.5 ± 0.7	<0.01	5.5	74%	HS	
Number	1.14 ± 0.36	AT1	0.71 ± 0.46	>0.01	2.45	37.5%	NS	
		AT2	0.71 ± 0.46	>0.01	2.45	47.5%	NS	
		AT3	0.35 ± 0.4	<0.01	4.9	68.7%	HS	
X-ray	1 ± 0	AT1	0.64 ± 0.49	<0.01	2.66	35.7%	HS	
		AT2	0.42 ± 0.51	<0.01	4	57.1%	HS	
		AT3	0.28 ± 0.46	<0.01	5.5	71.4%	HS	
USG	1 ± 0	AT1	0.85 ± 0.36	<0.01	1.4	14.2%	HS	
		AT2	0.5 ± 0.51	<0.01	3.5	50%	HS	
		AT3	0.28 ± 0.46	<0.01	5.5	71.4%	HS	

S.D—Standard deviation, B.T—Before treatment, A.T—After treatment, df— Degree of freedom, t—Test of significant, p—Probability, H.S- Highly significant N.S.- Non significant

Table 2: Showing effectiveness of drug in group-A.

problems form an important part of medical deliberations. Perhaps, this can be the reason for detailed description of the urinary system related disease i.e. *Mutrashmari* (Urolithiasis) in our Ayurvedic texts. Old literature gives a clear idea of the disease that it has come into existence from the very beginning. In *Ayurveda madhura* (sweets) and *guru* (heavy for digestion) diets and hot climate are the main cause for the formation of *Ashmari* (stones) [5]. As this can be understood hypothetically with the present contemporary science that these types of food may reduce the solubility crystals in the urine, this may lead into precipitations and formation of the stone. Where as in Modern Science they have considered many causative factors for the stone formation, but stone has been seen even in those patients also, where these factors are absent. So in total, the etiology of the disease is still unknown.

Discussion upon the Observation

All cases were analyzed for the incidence of *Mutrashmari* in relation to age, sex, socio-economic status etc.

In the present series of observation it was found that 33.33% of patients were in the age group 30-39 yrs, and 33.33% in the age group 40-49 yrs. This indicates that the incidence is higher in 3rd and 4th decade of life. Excessive work and by the excessive sweating leads to decrease in urine output in turn helps for the formation of stone. The incidence of *Mootrashmari* was relatively more in males (73.33%) than in females (26.66%) in the present study and the ratio was almost 2:1. The incidence of calculogenesis will be same in female compared to men after menopausal age, as citrates are not secreted during menstrual cycle and after menopause.

On observing the distribution of incidence among Hindu, Muslim and Christian, the prevalence was seen more in Hindu, (76.66%), then in Muslim (20%) and then Christian (3.33%). This does not indicate the incidence as higher in Hindus. This percentage is synchronous with their general percentage in the population. People of any community appear to be equally susceptible to the disease. Incidence of socio-economic status shows predominance of Lower middle class (56.66%). It will indicate that there is no any particular socio-economic status for stone formation.

Discussion on mode of action of drug

The major component isolated from this plant is lupeol, which is used to treat hypercrystalluria, hyperoxaluria and hypercalciuria. The

Sign /symptom	Mean ± S.D		Df	p-value	t-value	Effectiveness %	Remark
	BT	AT1					
Pain	2.13 ± 0.83	AT1	1.46 ± 0.51	<0.01	5.29	31.20%	HS
		AT2	1.2 ± 0.56	<0.01	5.13	43.75%	HS
		AT3	0.8 ± 0.67	<0.01	4.93	62.50%	HS
Haematuria	0.73 ± 0.45	AT1	0.6 ± 0.5	<0.05	1	18.10%	HS
		AT2	0.4 ± 0.5	<0.05	2	45.40%	HS
		AT3	0.2 ± 0.41	<0.01	4	72.20%	HS
Dysuria	1.93 ± 0.79	AT1	1.06 ± 0.88	<0.05	6.5	44.80%	S
		AT2	0.46 ± 0.51	<0.01	8.87	75.80%	HS
		AT3	0.33 ± 0.48	<0.01	6.8	82%	HS
Size of stone	4.2 ± 0.7	AT1	3.7 ± 0.9	<0.05	3.7	11	S
		AT2	2.4 ± 1.9	<0.01	4.4	43.30%	HS
		AT3	1.2 ± 1.7	<0.01	7.5	70%	HS
Site of stone	2.06 ± 0.70	AT1	1.7 ± 0.5	<0.05	2.6	16.10%	S
		AT2	1.06 ± 1.7	<0.01	3.8	48.30%	HS
		AT3	0.7 ± 0.45	<0.01	5.7	64.50%	HS
Number	1.2 ± 0.41	AT1	0.9 ± 0.25	<0.05	2.25	22.20%	S
		AT2	0.53 ± 0.51	<0.01	5.29	55.50%	HS
		AT3	0.33 ± 0.48	<0.01	9.53	72.20%	HS
X-ray	1 ± 0	AT1	0.53 ± 0.51	<0.01	3.5	46.60%	HS
		AT2	0.4 ± 0.50	<0.01	4.58	60%	HS
		AT3	0.2 ± 0.4	<0.01	7.4	80%	HS
USG	1 ± 0	AT1	0.53 ± 0.51	<0.01	3.5	46.6%	HS
		AT2	0.4 ± 0.50	<0.01	4.58	60%	HS
		AT3	0.13 ± 0.35	<0.01	9.5	86.60%	HS

Table 3: Showing effectiveness of drug in group-B.

RESULT	GROUP – A			GROUP – B		
	15 days	30 days	45 days	15 days	30 days	45 days
Cured	0	0	2	0	0	0
Maximum Improve	0	2	6	0	6	9
Moderate Improve	2	5	4	5	3	5
Mild Improve	5	7	2	7	5	1
No Improve	8	1	1	3	1	0

Table 4: Overall clinical assessment of result.

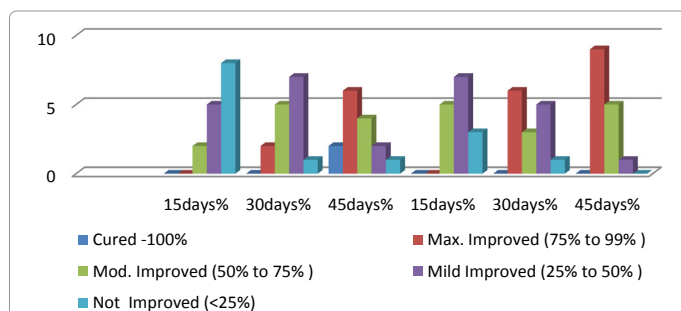


Figure 1: Overall clinical assessment of result. Group –A: Overall Clinical assessment on 45th day showed that 1 patient had no improvement, 6 patients had maximum improvement, 4 patients had moderate improvement; whereas 2 patients had mild improvement and 2 patients had completely cured. Group –B: Overall Clinical assessment on 45th day showed that 9 patients had maximum improvement, whereas 5 patients had moderate improvement, and 1 patient had mild improvement.

compound is also widely used to treat urinary disorders like urolithiasis, and it decreases elevated concentration of oxalate, phosphorous and magnesium in renal tissue. Lupeol also possesses antipyretic, analgesic, anti-inflammatory activity.

Discussion on result's of subjective criteria

The effectiveness of the treatment adopted in both the groups in respect to each parameter is tabulated on the basis of the difference between the scores before treatment and after treatment.

Pain: The effectiveness of *Varunamulatwak kwatha* is 76% with *t*-value 9.21 and the level of significance of *p*-value is <0.01, which is highly significant. The effectiveness of group-B is 62.5% with *t*-value 4.93 and the level of significance of *p*-value is <0.01. It shows that *Varunamula twak kwatha* having the analgesic and anti-inflammatory [8,9] properties.

Haematuria: The effectiveness of group-A is 83.33% with *t*-value 5.54 and the level of significance of *p*-value is <0.01, which is highly significant. The effectiveness of group-B is 72.7% with *t*-value 4 and the level of significance of *p*-value is <0.01. The effectiveness of *Varunamulatwak kwatha* over the group-A patients are showing good response to the treatment, because of the effectiveness of the intended drugs over the *mutrashmari* showing anti-inflammatory properties.

Dysuria: The effectiveness of group-A is 76.1% with *t*-value 6.23 and the level of significance of *p*-value is <0.01. The effectiveness of group-B is 82.7% with *t*-value 6.80 and the level of significance of *p*-value is <0.01, which is highly significant. Administration of fluids causes the increase urine output by this dysuria is subsided so flush out therapy is highly significant then *varunamulatwak kwatha*.

Objective criteria

Size of stone: The effectiveness of group-A is 88% with *t*-value 23.4 and the level of significance of *p*-value is <0.01, which is highly significant. The effectiveness of group-B is 71.42% with *t*-value 6.99 and the level of significance of *p*-value is <0.01, which is highly significant. It indicates that *Varunamulatwak kwatha* having the *Ashmaribhedana* (Anti-lithic) [5] property.

Site of stone: The effectiveness of group-A is 74.1% with *t*-value 5.52 and the level of significance of *p*-value is <0.01, which is highly significant. The effectiveness of group-B is 64.5% with *t*-value 5.7 and the level of significance of *p*-value is <0.01, which is highly significant.

It is due to stagnation of the urine in the specific area causes the precipitation of crystals by which stone is formed.

Number of stones: The effectiveness of group-A is 68.7% with *t*-value 4.95 and the level of significance of *p*-value is <0.01, which is highly significant. The effectiveness of group-B is 72.2% with *t*-value 9.53 and the level of significance of *p*-value is <0.01, which is highly significant.

Overall clinical assessment of result

Finally the clinical assessment was carried out on overall results of the effect of *Varunamula twak kwatha* on each individual sign and symptoms and collectively presented in the form of cured, maximum improvement, moderate improvement, mild improvement and no improvement. However it was evident that in group-A after 45 days 2 (100%) patients were cured, 6 (75%-99%) had maximum improvement, 4 (50%-75%) had moderate improvement, 2(25%-50%) had mild improvement and 1 (<25%) patient with no improvement. In group-B, 9 (75%-99%) had maximum improvement, 5 (50%-75%) had moderate improvement, 1 (25%-50%) had mild improvement. *Varunamula twakkwatha* has a significant role in the management of *Mutrashmari* as majority of patients showed highly significant response.

Conclusion

Following conclusion were drawn after analysis of review (Ayurvedic, Modern and Drug), clinical observation and interpretations on the parameters.

- In the observation it was found that, the lithotryptic [9] action of the *Varunamula twak kwatha* was showing significant effect.
- *Varunamulatwak kwatha* was capable of reducing Pain intensity (76%) than flush out therapy (62.5%).
- *Varunamulatwak kwatha* was capable of reducing Haematuria (84%) than flush out therapy (70%).
- *Varunamulatwak kwatha* was capable of reducing Dysuria (76.1%) and flush out therapy (82.7%).
- *Varunamulatwak kwatha* was capable of reducing Size of stone (88%) than flush out therapy (71.42%).
- *Varunamulatwak kwatha* was capable of reducing Site of stone (65.5%) than flush out therapy (61.6%).
- *Varunamulatwak kwatha* was capable of reducing number of stone (68.7%) and flush out therapy (72.2%).

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