



A CONTROLLED CLINICAL STUDY TO EVALUATE THE EFFICACY OF MUSHKAKADI GANA KASHAYA AND VARUNADI KWATHA IN THE MANAGEMENT OF MUTRASHMARI Vis a Vis “UROLITHIASIS”

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ABSTRACT

The genitourinary system is the most important part of human being. *Ashmari*, one among the *Mahagada*. Mutrashmari as a variant equated to urolithiasis is the most common ailment of the genitourinary system. In the present study, *Mushkakadi Gana Kashaya* an effective safe remedy in Ayurveda was evaluated. In the present study, 40 patient's urolithiasis from OPD/IPD of Muniyal Institute of Ayurveda Medical sciences, Manipal. It was a comparative study to evaluate the effect of *Mushkakadi Gana Kashaya* and *Varunadi Kashaya*, with a pre-test and post-test design. The assessment of therapy was done by suitable scoring methods which were critically analysed. The results thus obtained were subjected to statistical analysis. The end results thus obtained and graded according to various grades. The study showed *Mushkakadi gana* was effective in management of *Ashmari*.

Keywords: *Mushkakadi gana kashaya*, *Varunadi kwatha*, *Mutrashmari* Urolithiasis.

INTRODUCTION

Ayurveda is an ancient science of life, originated from 5000 years. The basis of which comprises the promotion and maintenance of life. One requires the harmony of not only the *Tridosha*, but also various functional components like *Srotas* of the body, through which the *Dosha* circulate. Amongst which *Mutravaha Srotas* is one of the most important components, comprising which is a component of *Basti*-one of *Trimarma* which enjoys the supreme importance. Various diseases have been mentioned with regards to the affliction of *Mutravaha Srotas*, but the most important dominant clinical problem nowadays is *Murashashmari*. It is considered as *Mahagada*¹ by *Sushruta*, which is of *Tridoshic* origin. It is also considered as - *Daruna Vyadhi*² because of the excruciating pain with which it presents. In contemporary medical science it is correlated with Urolithiasis

The process of forming stones in the kidney, bladder and Urethra. Urinary stones are the most common cause of blood in urine. Urinary calculi occur around 1 in 20 people at some point of time in their life. In the present era there are many treatment modalities like conservative, surgical, mechanical methods, which fail in eradicating the root cause & also are not cost effective³. There is mentioning of various formulations in the classical texts which work on *Samprapti* of the illness rather than offering temporary relief from the ailment. Henceforth the study focusses on the evaluation of an important polyherbal formulation in the form of *Mushkakadi Gana Kashaya*⁴.

Objective of Study:

- 1.To Evaluate the efficacy of the *Mushkakadi Gana Kashaya* in the management of *Mutrashmari* (Urolithiasis)
- 2.To compare and ascertain the efficacy of *Mushkakadi Gana Kashaya* and *Varunadi Kwatha*⁵ in the management of *Mutrashmari*.

Materials and Methods

Study Design: Single blind randomised comparative clinical study with pre test and post test.

A) Sample source: Patients attending OPD and IPD of the Department of Kayachikitsa, Muniyal Institute of Ayurveda Medical Sciences, Manipal, Udipi. Were randomly selected.

B) Drug source: Ingredients was procured from authentic vendor, approved by *Dravyaguna* expert from Muniyal Institute of Ayurvedic Medical sciences.

Preparation of medicine was done in Muniyal Pharmacy Manipal.

Selection of cases.

SAMPLE SIZE: A total of 40 patients were selected patients having classical symptomatology of *Mutrashmari* (Urolithiasis).

A) Inclusion criteria

1. Age: between 18 to 60 years
2. Sex: either sex
3. Radiological evidence of calculus (up to 10 mm) in kidney, ureter or urinary bladder

B) Exclusion criteria

1. Age below 18 years and above 60 years
2. calculus size more than 10mm
3. Impacted calculus
4. Gross hydronephrosis
5. Pyelonephritis
6. Malignancy
7. Patients with obstruction in urinary passage
8. Patients with known metabolic abnormality for calculus formation
9. Any other complication of calculus
10. Patients undergoing treatment for any other serious illness.

Intervention:

40 patients complaining of *Mutrashmari* were randomly divided into the following two groups, each comprising of 20 patients each.

• **First Group A:** *Mushkakadi Gana kashaya*.

• **Second Group B:** *Varunadi Kwatha*.

Dosage:

Group A: *Mushkakadigana kashaya*-50 ml twice morning and evening half an hour before the food for 45 days.

Group B: *Varunadikwatha* -50 ml twice with added *Prakshepaka Dravyas* jaggery 12 gms and *Yavakshara* 3 gms each morning and evening half an hour before food.

Follow Up:15 Days After the completion of medicine.

Duration of Medication:45 days

Withdrawal Criteria – Any adverse drug reactions of the drug will be withdrawn.

Table 1: Drugs of *Mushkakadi Gana Kashaya*

Drug name	Part used	Botanical name	Quantity in gms
<i>Mushkaka (Krisnapatala)</i>	Bark	<i>Stereospermum suaveolns</i>	3 gms
<i>Sruga(Snuhiguda)</i>	Stem	<i>Euphorbia nerifolia linn</i>	3 gms
<i>Amalaki</i>	Fruit	<i>Embllica officinalis</i>	3 gms
<i>Haritaki</i>	Fruit	<i>Terminalia chebula</i>	3 gms
<i>Vibhitaki</i>	Fruit	<i>Terminalia bellirica Roxb</i>	3 gms
<i>Dvipi(citraka)</i>	Root	<i>Plumbago zeylanica</i>	3 gms
<i>Palasa</i>	Bark	<i>Butea monosperma</i>	3 gms
<i>Dhava</i>	Bark	<i>Anogeissus latifoli wall</i>	3 gms
<i>Simsipa</i>	Bark	<i>Dalbergia sissoo Roxb</i>	3 gms

Table 2: Drugs of *Varunadi Gana*

Drug name	Part used	Botanical name	Quantity in gms
<i>Varuna</i>	Bark	<i>Crataeva nurvala</i>	12 gms
<i>Sunthi</i>	Rhizome	<i>Zingiber officinale</i>	2 gms
<i>Goksura</i>	Fruit	<i>Tribulus terrestris</i>	10 gms

Prakshepakadravyas- *Yavakshara*-3gms, *Jaggery*-12gms

Method of preparation of Drug:⁶

The drugs of group A/ group B were taken each in coarse powder form. After coarse powder add 8 parts of water boiled and reduced to one fourth. The decoction was filtered and given to the patients.

Investigations

Urine Examination

1. Routine:
2. pH:
3. Microscopic

Blood

4. Hb(g/dl):
5. TLC
6. DLC
7. ESR
8. Blood Sugar- FBS AND PPBS
9. B. Urea (mg./dl)
10. S. Uric Acid
11. S. Creatinine(mg/dl)

Ultrasound – Abdomen and Pelvis

1. Size
2. Hydronephrosis
3. Thickness of parenchyma
4. Ureter
5. Bladder

Assessment Criteria

In this section, parameter of study, criteria of scoring and criteria for assessment of therapy is discussed.

Parameters of Study:

Criteria For Examination And Assessment –

1. Assessment was done on the basis of relief in signs and symptoms of urolithiasis.
2. Other investigation findings (laboratory as well as USG) on the basis of specially designed research proforma through scoring pattern.

Subjective criteria:

Assessment of therapy was done according to the relief observed in the signs and symptoms with the help of following scoring pattern.

Table 3: Assessment Criteria Scores

Subjective parameters			
1	Pain	No pain	0
		Occasional pain	1
		Constant dull ache pain	2
		Severe constant pain	3
2	Burning micturition	No burning micturition	0
		Occasional burning micturition	1
		Constant burning micturition	2
		Severe burning micturition	3
Objective parameters			
1	Renal angle tenderness	No tenderness	0
		Mild tenderness	1
		Moderate tenderness	2
		Severe tenderness	3
2	Size of Calculi	No calculi	0
		Upto 3.5 mm	1
		Between 3.6-7 mm	2
		Between 7.1 -10mm	3
3	Haematuria	No RBC	0
		0-5 RBC/HPF	1
		6-10 RBC/HPF	2
		>10 RBC/ HPF	3

Follow ups and Results

4 follow ups- on 15th day, on 30th day, on 45th day and on 60th day

Those cases, which were in regular follow ups for 45 days were taken for clinical study. The criteria of assessment were mainly on the subjective and objective parameters. Intermediate follow ups were recorded at interval of 15 days. Observation for relief in sign and symptoms in all follow up was done. Last follow up was recorded to see the improvement.

Data analysis methods

Most of the signs & symptoms of *Mutrashmari* described are subjective in nature, and for statistical analysis scoring system has been adopted. Statistical analysis and percentage of relief (before and after treatment) was taken to know the efficacy of the trial drugs.

Statistical Assessment –

To evaluate this, total scores observed before treatment (B.T.) and after treatment (A.T.). Average of respective scores is calculated and percentage of change/ improvement is drawn by following formula:

$$\frac{\text{Average BT} - \text{Average AT} \times 100}{\text{Average BT}}$$

➤ To assess the effect of drugs on by applying student paired “t” test for within the group, for between the group unpaired test ‘t’ was used. The obtained results were interpreted as: -

- Non-Significant >0.05
- Significant <0.05
- Highly Significant P < 0.001
- Extremely significant P < 0.0001

Results

Table 4: Comparison Within the Group A

	BT	Mean Score		%	SD	SEM	T	P	SIGNF.	
			Mean Diff							
Pain	1.95	AT	0.65	1.30	66.6	0.470	0.105	12.365	<0.0001	ES
		AF	0.35	1.60	82.0	0.502	0.112	14.236	<0.0001	ES
Burning micturition	1.65	AT	0.60	1.05	63.6	0.686	0.153	6.842	<0.0001	ES
		AF	0.30	1.35	81.8	0.587	0.131	10.283	<0.0001	ES
Tenderness	1.30	AT	0.65	0.65	50.0	0.587	0.131	4.951	<0.0001	ES
		AF	0.45	0.85	65.3	0.670	0.150	5.667	<0.0001	ES
Size of stone	5.71	AT	1.425	4.285	75.1	1.440	0.322	13.303	<0.0001	ES
		AF	1.05	4.660	81.6	1.416	0.316	14.719	<0.0001	ES
Haematuria	0.55	AT	0.30	0.25	45.5	0.444	0.099	2.517	0.0210	S
		AF	0.15	0.50	90.1	0.598	0.133	2.990	0.0075	VS
Number of stones	2.30	AT	0.95	1.35	58.6	0.988	0.220	6.110	<0.0001	ES
		AF	0.65	1.65	71.7	1.226	0.274	6.020	<0.0001	ES

Table 5 Comparison Within the Group B

	BT	Mean Score		%	SD	SEM	T	P	SIGNF.	
			Mean Diff							
Pain	1.90	AT	0.70	1.20	63.1	0.414	0.091	13.077	<0.0001	ES
		AF	0.40	1.50	78.9	0.513	0.114	13.077	<0.0001	ES
Burning micturition	1.40	AT	0.45	0.95	67.8	0.510	0.1141	8.324	<0.0001	ES
		AF	0.45	0.95	67.8	0.510	0.1141	8.324	<0.0001	ES
Tenderness	0.80	AT	0.55	0.25	31.2	0.444	0.099	2.517	0.0210	S
		AF	0.45	0.35	43.7	0.587	0.131	2.666	0.0153	S
Size of stone	6.425	AT	1.82	4.605	71.6	1.560	0.348	13.203	<0.0001	ES
		AF	1.82	4.605	71.6	1.560	0.348	13.203	<0.0001	ES
Haematuria	0.70	AT	0.3	0.40	57.1	0.502	0.112	3.559	0.0021	VS
		AF	0.3	0.40	57.1	0.502	0.112	3.559	0.0021	VS
Number of stones	3.05	AT	1.20	1.85	60.6	1.040	0.232	7.995	<0.0001	ES
		AF	0.95	2.10	68.9	1.021	0.228	9.200	<0.0001	ES

Table 6: Comparison Between the Groups

	Comparison Between The Group							
	Group	N	Mean	SD	Mean Diff	t	p	Significant
Pain	AT							
	A	20	0.65	0.812	0.05	0.2043	0.8392	NS
	B	20	0.70	0.732				
	AF							
	A	20	0.35	0.489	0.05	0.3188	0.7517	NS
	B	20	0.40	0.502				
Burning Micturition	AT							
	A	20	0.60	0.753	0.15	0.7368	0.4658	NS

	B	20	0.45	0.510				
	AF							
	A	20	0.30	0.470	0.15	0.9667	0.3398	NS
	B	20	0.45	0.510				
Tenderness	AT							
	A	20	0.65	0.812	0.10	0.4204	0.6766	NS
	B	20	0.55	0.686				
	AF							
	A	20	0.45	0.686	0.00	0.000	>0.999	NS
	B	20	0.45	0.604				
Size Of Stone	AT							
	A	20	1.425	1.696	0.395	0.6834	0.4985	NS
	B	20	1.820	1.951				
	AF							
	A	20	1.050	1.538	0.770	1.386	0.1738	NS
	B	20	1.820	1.951				
Number Of Stones	AT							
	A	20	0.95	1.146	0.25	0.5659	0.5748	NS
	B	20	1.20	1.609				
	AF							
	A	20	0.65	1.089	0.30	0.7850	0.4373	NS
	B	20	0.95	1.317				
Hematuria	AT							
	A	20	0.30	0.571	0.0	0.000	>0.999	NS
	B	20	0.30	0.470				
	AF							
	A	20	0.15	0.366	0.15	1.125	0.2675	NS
	B	20	0.30	0.470				

Table 7- Overall Effect Of *Muskhakadi Gana*

Total Effect	Percentage	No Of Patients	% Of Relief
Cured	100%	4	20
Markedly Improved	76-99%	7	35
Mild Improvement	51-75%	8	40
Improvement	25-50%	1	5
No Improvement	<25%	0	0

Graph 1: Overall Effect Of Muskhakadi Gana

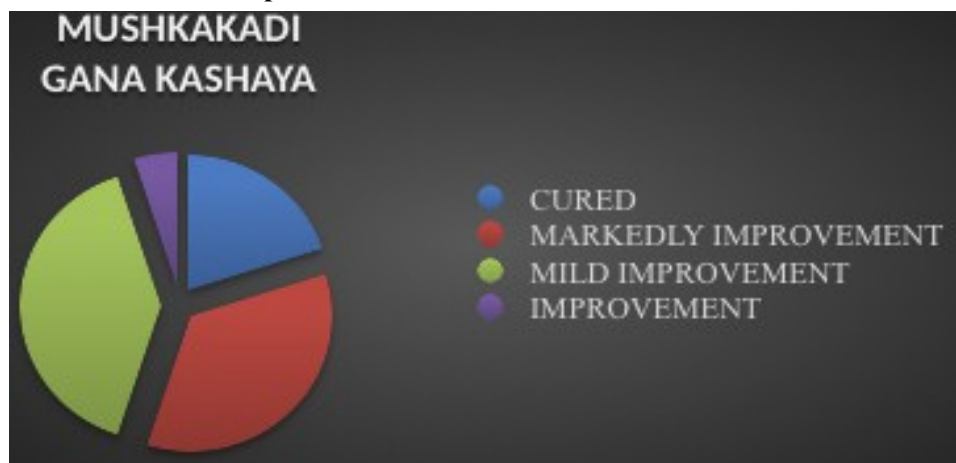


Table 8: Overall Effect Of Varunadi Kashaya

Total Effect	Percentage	No of Patients	% of Relief
Cured	100%	1	5
Markedly Improved	76-99%	4	20
Mild Improvement	51-75%	10	50
Improvement	25-50%	5	2
No Improvement	<25%	0	0

Graph 2: Overall Effect Of Varunadi Kwatha



Table 9: Group A-Effect of therapy in number & size

	0-3.5mm (%)		3.6-7mm (%)		7.1-10mm (%)	
	No	%	No	%	No	%
Expelled Out	2	10%	10	50%	1	5%
Decrease In Size	0	0	3	15%	4	20%
No Change	0	0	0	0	0	0
Increase In Size	0	0	0	0	0	0

Graph 3 Group A-Effect of therapy in number & size

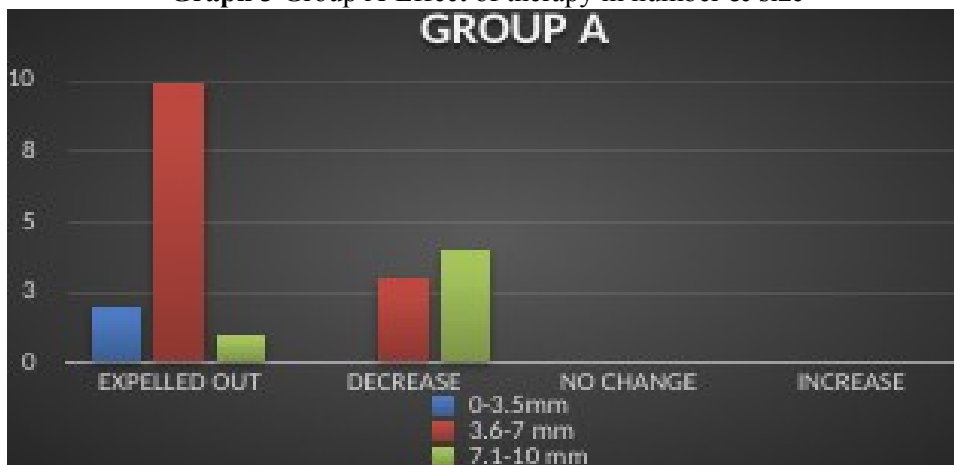
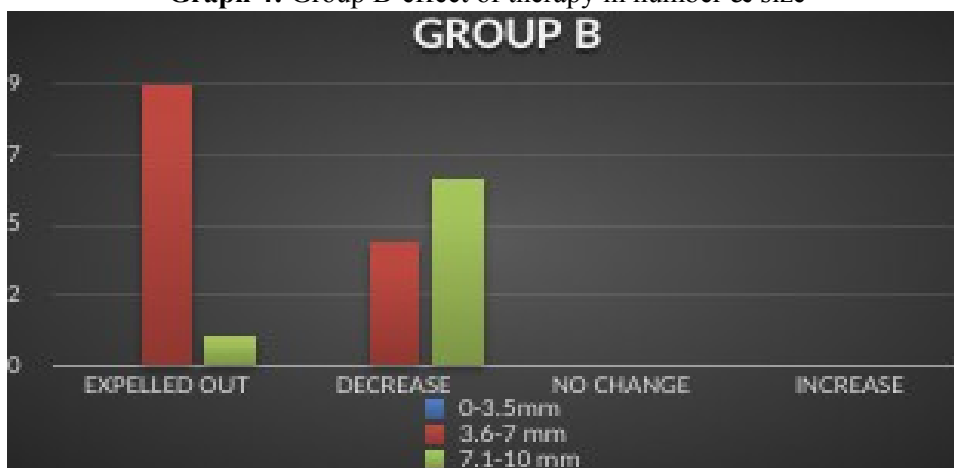


Table 10: Group B-effect of therapy in number & size

	0-3.5mm (%)		3.6-7mm (%)		7.1-10mm (%)	
Expelled Out	0	0	9	45%	1	5%
Decrease In Size	0	0	4	20%	6	30%
No Change	0	0	0	0	0	0
Increase In Size	0	0	0	0	0	0

Graph 4: Group B-effect of therapy in number & size



DISCUSSION

Mode Of Action Of *Mushkakadi Gana*

Mushkakadi Gana is a polyherbal formulation. The herbs have the properties like *Katu-Tikta-kashaya Rasa*, *Ushna veerya*, *Katu Vipaka*. The overall effect of the formulation is dominantly *Tridoshahara* in nature. *Mutrashmari* is known *Tridoshic* in nature, but *Kapha dosha* is the main contributing factor in the pathogenesis of *Mutrashmari*, which is evident with the

pathological sequel of stagnation. Stagnation of urine leads to concentration, infection & thereby increased risk of calculi formation. Hence, the main line of treatment should be *Kaphahara*, *Srotoshodhana*, *Vata anulomana*, *Agni Vardhana*, *Ashmari Hara*, *Mutrala*, *Vedanasthapana*.

Pain control is an important measure to be taken in *Mutrashmari*. Acute spasmodic or colicky pain results

when calculus moves downwards through the urinary tract or lodges at a certain junction.

The drugs in *Mushkakadi* drug like *Mushkaka*, *Sruga*, *Amalaki*, *Haritaki*, *Vibhitaki*, *Dvipi* (*Chitraka*), *Palasa*, *Dhava* and *Simsipa* possess *Vedanasthapana* Property. The *Vatanulomana*, *Shothahara* and *Mutrala* properties of the above ingredients help to relieve pain.

Ingredients such as *Chitraka*, *Palasa* and *Sruga* have properties of *Deepana*, *Pachana* which helps to maintain the *Agni* and prevent formation of *Ama* at *Jataragni* level.

Most of the drugs in *Mushkakadi gana* possess *Laghu*, *Ruksha* properties such as *Mushkaka*, *Amalaki*, *Vibhitaki*, *Haritaki*, *Chitraka*, *Palasa*, *Simsipa* which do *Lekhana* of excess *Kapha*. It also clears out the *Srothorodha* due to *Laghu*, *Ruksha* and *Tikshana* properties, simultaneously pacifies *kapha* and ultimately helps in crushing and expulsion of the calculi. The *Bhedana* property of *Vibhitaki* also helps in breaking the calculi and expulsion of the same.

The drugs *Amalaki*, *Haritaki*, *Vibhitaki*, *Chitraka* do *Vatanulomana* thereby helping in expulsion of the *Ashmari* and also reduces pain. In *Mushkakadi Gana*, the drug *Amalaki* which has *Pancha Rasa* (*Madhura rasa*) *Sheeta Virya* acts as *Mutrala*.

Haematuria occurs due to injury to the urinary system by the projecting part. Drugs like *Amalaki*, *Mushkaka*, *Vibhitaki*, *Haritaki*, *Palasa*, *Simsipa* possess *Kashaya Rasa* which does the action of *Stambhana* thereby stopping or reducing haematuria, also *Amalaki* possesses *Sheeta Virya* which also does *Stambhana*.

Tenderness occurs due to inflammation of the urinary tract. The *Mutrala* activity of the *Amalaki* along with *Jwaragna* properties of *Sruga*, *Shothahara* properties of *Sruga*, *Amalaki*, *Haritaki*, *Chitraka* and *Simsipa* helps in reducing tenderness.

Rasayana effect of *Amalaki* helps in overall improvement and prevention of further occurrence.

Mode of Action of *Varunadi Kwatha*

Varunadi kwatha possess all the needful properties like *Kaphahara*, *Lekhana* and *Mutrala*. The ingredients of the compound pacify *Kapha Dosha* by virtue of their *Ruksha Guna*, *Katu Vipaka* and *Ushna Virya* and also show *Lekhana* property due to *Ushna virya*.

Yavakshara has the property of *Lekhana*. *Vatanulomana*, *Shothahara* and *Mutrala* properties of ingredients helps to relieve pain and *Sthanikashotha*. *Jwara* is also relieved due to the *Jwarahara* action of *Varun* and *shunti*. *Deepana* property of the drug helps to increase the *agni* which further checks the formation of *Ama* at *Jataragni* level. All the ingredients of the drug, by their *Bhedana*, *Ashmarihara* and *Kaphahara* *Karmas* along with *Mutrala Karma*, are helpful to reduce the size of the *Ashmari* and expel it out from the body.

CONCLUSION

Mushkakadi Gana Kashaya is *Ashmari* is a disease of *Mutravaha srotas* caused when the *Kapha Pradhana Dosha* comes into the *Basti* (urinary system) along with *Mutra*. Two major aetiological factors are *Ashamshodhana* and *Apathya Sevana*. *Ashmari* can be compared to the condition of *Urolithiasis* irrespective of whether it is found in *Kidney*, *Ureter*, *Bladder* or *Urethra*. After treatment group A showed more improvement in pain, tenderness, size of stone, while group B showed improvement in Burning micturition, number of stone and Haematuria. After following up Group A showed improvement in all subjective and objective parameters. Better results may be achieved by observing the findings in larger population and also by studying their effect on different type (chemical composition) of stone.

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