

Managing Mutrashmari through Ayurvedic Drugs-I: Kulattha (*Dolichos biflorus* Linn)

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Abstract

This paper presents the findings of a clinical trial conducted in the suburbs of Jammu (Jammu & Kashmir State) to assess the efficacy of Kulattha – a herbal drug, on a random sample of ten mutrashmari patients. In all there were 12 calculi stones, of which 9 were in Kidney and 3 were in Ureter. There were in all 12 Ashmari stones, out of which 8 (67%) were unilateral and single, 1 site (16%) was multiple (double) but unilateral while the remaining 2 (17%) were bilateral and single in each kidney. Calculi were classified into two size ranges namely <4 mm & 4–8 mm. Ninety percent calculi were in the size range of 4–8 mm and the remaining 10% cases were in the range of <4 mm. The Kulattha therapy completely cured 4 (33.3%) of the Mutrashmari cases. It markedly improved 4 (33.4%) cases and improved 3 (25.0%) of the cases. Only 1 (8.4%) cases did not show significant response to therapy. The overall rating of the therapy was 1.9. In all there were 9 Kidney stones. Three stones (33.4%) were completely cured, 3 (33.3%) were improved. Two (22.2%) were improved towards curing but 1 (11.1%) did not respond to the therapy. Overall rating of the therapy was 1.9. There were 3 Ureter stones. One (33.3%) each, was cured, markedly improved and improved respectively. Overall rating of the therapy towards Ureter stones was 2.0. Kaphaja Ashmari was represented in 6 (53%) of the patients, followed by 3 (27%) in Vataja and 1 (20%) in Pittaja Ashmari. This shows the dominance of Kaphaja type of Ashmari in the study area. There were 8 stones with Kaphaja Ashmari, out of which 3 (37.5%) were completely cured, 4 (50%) stones were markedly improved and 1 (12.5%) showed improvement in symptoms. The therapy depicted good overall rating of 2.3. There was only one stone of Pittaja Ashmari type and no significant improvement was noticed in this case. There were 3 stones with Kaphaja Ashmari, out of which 1 (33.3%) case was completely cured, while improvement in the remaining 2 (66.7%) stones was recorded. The therapy depicted an overall rating of 1.7. The effect of Kulattha was highly significant on Mutradhara Sanga (58.3%), Basti Vedana (47.1%), Atiavila Mutrata (41.2%) and Nabhi Vedana (39.1%). The effect was significant on Gomeda Prakasam (57.1%) while non-significant effect was observed on Sarudhiramutrata (57.1%), Sevani Vedana (36.4%) and Mehan Vedana (20.0%). The effect was highly significant on Dysuria (61.5%) followed by Pain (58.1%) and Hematuria (44.4%). Significant effect was found on Tenderness at Renal Angle (62.5%) and Burning Micturition (35.3%). Nausea and vomiting and fever parameters did not affect the sample cases. The Post-therapy results in comparison to pre-therapy results showed a decreasing trend in certain parameters while an increasing trend in others. All the parameters, however, remained within their normal limits both in the pre and post-therapy observations. Overall Success Rate of Kulattha therapy in mitigating the problems of Mutrashmari and removal/disintegration of the calculi was 63.3 percent.

Keywords : Calculi; Mootrashmari; Ashmari; Kidney stone; Ureteric stone; Kulattha; *Dolichos biflorus*.

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Introduction

According to an estimate every year about 6 million Americans suffer from urinary stones, and about 12% of Indian population suffer from urinary stones out of which 50% may end up losing kidneys. Mutrashmari is a disease pertaining to mutravaha strothas which comes under *Basti* marma. Ashmari gets formed when vata dries up the mutra, sukra, pitta or kapha stored in the urinary bladder,¹⁰ leading to distention of bladder, severe pain in and around it, difficulty in micturition; etc.⁴ Formation of Mutrashmari, according to Sushruta, is due to Srotovaigunya, resulting from Dusita Kapha localized in Basti, in conjunction with Pradusita Vata and Pitta, is responsible for the cause of Ashmari. Ayurvedic texts have described four types of urinary calculi: sleshmaashmari, pittaashmari, vataashmari, and sukraashmari.⁷ These stones are found in all parts of the urinary tract, the kidney, the ureters and the urinary bladder. The factors responsible for the formation of calculi have been well documented.^{1-3,7,9,11}

The modern system of medicine has identified responsible factors⁸ and has researched a number of procedures but in spite of all these techniques, surgery in some form remains the treatment of choice, yet the recurrence is inevitable in about 60% of cases. Therefore, the herbal drugs have proven effects like immunomodulation, adaptogenic and antimutagenic. The World Health Organization's Canberre conference in 1976, promoted the concept of 'Traditional' medicines for the developing countries. Accordingly, an attempt has been made in this paper to present the findings of the clinical study conducted on the traditional Ayurvedic herbal drug Kulattha against Mutrashmari roga.

Materials and Methods

A research experiment was planned to evaluate the efficacy of *Kulattha kwath* – a herb known to be effective against Ashmari under suburbs of Jammu conditions (JIAR & R.S. Pura, Jammu & Kashmir State).

Treatment details: 50 ml of decoction of Kulattha was given orally twice daily for 60 days with a follow up at every successive 15 days by an Ayurvedic doctor till the end of three months.

Statistical design: The clinical trial was conducted as a Completely Randomized Design with 10 mutrashmari patients as replications. The selection

was made out of the patients coming to the OPD at RS Pura, District Hospital, for medical advice. The mutrashmari patients (diagnosed radiologically and microbiologically) suffering from calculi of size less than or equal to 8 mm were randomly selected for the study. They were confirmed to be not suffering from other serious ailments like tuberculosis, asthma, etc. The following diagnostic tests were conducted before initiation and conclusion of the study: TLC, DLC, Hb and ESR; Blood urea, serum creatinine, fasting blood sugar, S. cholesterol; Presence of RBC, pus cells, epithelial cells, renal casts and crystals in urine; X-ray and ultrasonography of KUB region to confirm the presence and measure of the size of calculi. The patients were in the range: 21-60 years of age.

To introduce objectivity into the signs and symptoms of a disease, the concept of scoring or scaling was adopted.

Subjective criteria: Assessment of mutrashmari was done on an increasing symptom severity graded 5-point scale (0-4):

Pain degree score: 0 = No pain; 1 = Occasional pain, did not require treatment; 2 = Occasional pain but, required treatment; 3 = Constant dull ache pain, required treatment; 4 = Severe constant pain, but did not show relief even after treatment.

Burning micturition degree score: 0 = Burning micturition; 1 = Occasional burning micturition; 2 = Occasional burning micturition, requiring treatment; 3 = Constant burning micturition requiring treatment; 4 = Constant severe burning micturition but no relief even after treatment

Dysuria score: 0 = No dysuria; 1 = Occasional dysuria; 2 = Occasional dysuria requiring treatment; 3 = Constant dysuria which requiring treatment; 4 = Constant severe dysuria but show no relief even after treatment

Tenderness in renal angle score: 0 = No tenderness; 1 = Mild tenderness; 2 = Moderate tenderness; 3 = Severe tenderness; 4 = Acute tenderness

Hematuria: 0 = No RBC/Hpf; 1 = 0-5 RBC/Hpf; 2 = 6-10 RBC/Hpf; 3 = 11-15 RBC/Hpf; 4 = >16 RBC/Hpf.

Pus cells: 0 = No pus cells/Hpf; 1 = 0-5 pus cells/Hpf; 2 = 6-10 pus cells/Hpf; 3 = 1-15 pus cells/Hpf; 4 ≥ 16 pus cells/Hpf.

Criteria for measuring total effect of a therapy: For assessing the total effect of therapy following 4-point graded scale was adopted for scoring the symptoms:

- **3 = Cured:** 76–100% relief:
 - Complete relief in subjective signs and symptoms.
 - Absence of any calculus in urinary tract with radiological evidence
- **2 = Markedly improved:** 51–75% relief:
 - Relief in subjective signs and symptoms
 - Downward movement or partial disintegration of Mūtrāśmari with radiological evidence.
- **1 = Improved:** 26–50% relief:
 - Relief in signs and symptoms
 - Without any change in size of stone confirmed with radiological evidence.
- **0 = Unchanged:** 0–25% relief:
 - Relief in subjective sign and symptoms

Measurement of the effect of therapies: The Effect or Relief from a therapy is defined as follows: **Effect = (BT - AT),**

$$\text{Relief (\%)} = (\text{Effect} \times 100) / \text{BT}$$

where BT and AT are the disease symptoms (scored or rated adopting an appropriate graded scale) before and after the therapy. These are in fact the weighted averages, especially in this paper.

Overall rating is the weighted average (in this article), weights being the observed scores, by adopting a suitable graded scale. This is an *excellent objective* method developed and used in this study. Similarly, other clinical symptoms were allotted the scores on the basis of severity. Some attributes were easily understandable in their presence (1) or absence (0). The results were also often presented as frequency, number, percentage; etc. for better acceptance in these formats.

Statistical analysis: Proper statistical analysis of the data generated from the clinical trial was carried out while considering the Completely Randomized Design. Specifically, the following analysis was carried out:

- **Chi-square test** was used to ascertain uniformity of allocation of sample cases.
- **Chi-square test** was also used to test the independence of different factors, groups, in a contingency table.
- **Chi-square test** was also used to test the homogeneity of row-factors or column-factors when the data could be expressed in the form of a contingency table.⁵
- **CD (0.05) or CD (5%):** Critical difference at 5% level of significance to test the significance of the difference between two means. It is, in fact a practical form of the *Student's t-test*.

Note: The tabulated value of *Chi-square* is presented in the last cell of first row (for testing homogeneity of column values in a row), and last cell of the first column (for testing homogeneity of row values in a column) or in the last cell of a table (for testing the independence of row-factor and column-factor in a contingency table), at 5% level of significance, with degrees of freedom shown in the brackets, while the corresponding calculated chi-square values are in the last rows/columns.

Results and Discussion

Sites of calculi: The Kulattha therapy was replicated on 10 randomly selected mutrashmari patients. In all there were 12 calculi sites, of which 9 were in kidney and 3 were in ureter (Table 1). Thus, Mutrashmari roga was primarily located in kidney and ureter organs of the sample patients. None of the registered (OPD) bladder stone patients met the inclusion criteria, particularly pertaining to the size of the calculi, so none of them could be inducted into this clinical trial.

Table 1: Number and site of stones in the cases*

Site	S	M	B	T	%
Kidney	5	1 × 2	1 × 2	9	75
Ureter	3	0 × 2	0 × 2	3	25
Total	8	1 × 2	1 × 2	12	-

*S = Single and unilateral, M = Multiple (double) and unilateral, B = Bilateral and Single in each Kidney, T = Total

Unilateral and Bilateral stones: There were in all 12 ashmari stones, out of which 8 (67%) were unilateral and single, 1 site (16%) was multiple (double) and unilateral while the remaining 2 (17%) were bilateral and single stone in each kidney (Table 1).

Size range of calculi: Calculi were classified into

two size ranges namely <4 mm and 4–8 mm. Further, if a patient was having calculi at more than one site, he was included in the study (Table 2) for his largest calculi size only. On overall basis, most of the calculi cases, i.e. 90% were in the size range of 4–8 mm and the remaining 10% cases were in the range of <4 mm.

Table 2: Calculi sizes in the cases

Size (mm)	K	%
<4 mm	1	10
4–8 mm	9	90

Major Complaints

Ayurvedic system: Information on a number of major Ayurvedic complaints was recorded. The results are presented in Table 3. On overall basis, Ati Avilamutrata, Nabhi Vedana, Mutradhara Sanga and Basti Vedana were the most common problems prevalent in about 80–90% of the patients. Sevani Vedana was common in 60% cases. Sarudhira Mutrata, Mehan Vedana and Gomeda Prakasam were present in about 35–45% of the patients. Mutra Vikirana, Sasikitam, Visirnadhara, and Mrudanti Medhara were present in about 10% of the cases and were relatively insignificant in importance.⁶

Effect on mutrashmari: Results are presented in Table 3. The Kulattha therapy completely cured 4 (33.3%)

of the cases. It markedly improved 4 (33.4%) cases and improved 3 (25.0%) of the cases. Only 1 (8.4%) cases did not show significant response to therapy. The overall rating of the therapy was 1.9.

Effect of kulattha therapy on kidney stones: In all there were 9 Kidney stones. Three stones (33.4%) were completely cured, 3 (33.3%) were improved. Two (22.2%) were improved towards curing but 1 (11.1%) did not respond significantly to therapy. Overall rating of the therapy was 1.9 (Table 3).

Effect of the therapy on ureter stones: Results are reported in Table 3. There were 3 Ureter stones. One (33.3%) each, was cured, markedly improved and improved respectively. Overall rating of the therapy towards ureter stones was 2.0.

Table 3: Effect of kulattha on mutrashmari

Grade of Cure	Kidney		Ureter		Total	
	No.	%	No.	%	No.	%
Cured	3	33.3	1	33.3	4	33.3
Markedly improved	3	33.4	1	33.3	4	33.3
Improved	2	22.2	1	33.4	3	25.0
Unchanged	1	11.1	0	0.0	1	8.4
Total	9	100.0	3	100.0	12	100.0
Overall rating	1.9	-	2.0	-	1.9	-

Effect of the therapy on ashmari types: All the three types of Ashmari viz. Kaphaja, Pittaja and Vataja were present in the study. The results are reported in Table 4. *Kaphaja* was represented in 6 (60%) of the

patients, followed by 3 (30%) in *Vataja* and 1 (10%) in *Pittaja* Ashmari conforming to the Prakriti and Nidanans of the patients. This shows the dominance of *Kaphaja* type of Ashmari in the study area.

Table 4: Ashmari types present in the cases

Type	K	%
Kaphaja	6	60
Pittaja	1	10
Vataja	3	30

Kaphaja ashmari: There were 8 stones with Kaphaja Ashmari, out of which 3 (37.5%) were completely cured, 4 (50%) stones were markedly improved and 1 (12.5%) showed improvement in symptoms. The therapy depicted good overall rating of 2.3 (Table 5).

Vataja ashmari: There were 3 stones with Kaphaja Ashmari, out of which 1 (33.3%) case was completely cured, while improvement in the remaining 2 (66.7%) stones was recorded. The therapy depicted an overall rating of 1.7 (Table 5).

Table 5: Effect of kulattha on mutrashmari

Grade of Cure	Kaphaja		Pittaja		Vataja		Total	
	No.	%	No.	%	No.	%	No.	%
Cured	3	37.5	0	0.0	1	33.3	4	33.3
Markedly improved	4	50.0	0	0.0	0	0.0	4	33.3
Improved	1	12.5	0	0.0	2	66.7	3	25.0
Unchanged	0	0.0	1	100.0	0	0.0	1	8.4
Total	8	100.0	1	100.0	3	100.0	12	100.0
Overall rating	2.2	-	0.0	-	1.7	-	1.9	-

Net Effect of Kulattha Therapy

Ayurvedic parameters: For in depth evaluation of Kulattha therapy, its effect was studied on the following 8 important Ayurvedic parameters

associated with Ashmari (Table 6). The effect of a therapy was measured on each of these parameters, singly and collectively by the method described under Methodology.

Table 6: Ayurvedic parameters

S. No	Ayurvedic parameters	S. No	Ayurvedic parameters
1.	Nabhi Vedana	5.	Mutradhara sanga
2.	Basti Vedana	6.	Sarudhiramutrata
3.	Sevani Vedana	7.	Gomeda prakasam
4.	Mehan Vedana	8.	Atiavila mutrata

The effect of Kulattha was highly significant (Table 7) on Mutradhara Sanga (58.3%), Basti Vedana (47.1%), Atiavila Mutrata (41.2%) and Nabhi Vedana (39.1%). The effect was significant on

Gomeda Prakasam (57.1%) While non-significant effect was observed on Sarudhiramutrata (57.1%), Sevani Vedana (36.4%) and Mehan Vedana (20.0%).

Table 7: Pre and post-kulattha therapy mean scores (ayurvedic system)* of ashmari patients

Parameter	BT	AT	%	CD (5%)	Parameter	BT	AT	%	CD (5%)
Nabhi Vedana	2.3	1.4	39.1	0.41 ¹	Mutradhara Sanga	1.2	0.5	58.3	0.35 ¹
Basti Vedana	1.7	0.9	47.1	0.30 ¹	Sarudhiramutrata	0.7	0.3	57.1	0.50 ^{ns}
Sevani Vedana	1.1	0.7	36.4	0.63 ^{ns}	Gomeda Prakasam	0.7	0.3	57.1	0.37 ⁵
Mehan Vedana	0.5	0.4	20.0	0.37 ^{ns}	Atiavila Mutrata	1.7	1.0	41.2	0.35 ¹

*BT, AT: Before, After treatment. Superscript 1, 5 indicate significant differences (BT-AT) at 1% & 5% *p*-values respectively. Superscript ns indicate non-significant differences (BT-AT) at *p* = 5%. The difference (BT-AT) which is less than CD (5%) value is non-significant (*p* > 0.05).

Modren parameters: The performance of the therapies was evaluated on the 7 parameters of the modern system (Table 8). Nausea and Vomiting and Fever parameters did not affect the sample cases. Therefore, they are excluded in the further presentation of results. The results are presented in

Table 9. The effect was highly significant on dysuria (61.5%) followed pain (58.1%) and Haematuria (44.4%). Significant effect was found on tenderness at renal angle (62.5%) and Burning micturition (35.3%).

Table 8: Modern system parameters

S. No	Parameters	S. No	Parameters
1.	Pain	5.	Nausea and vomiting
2.	Burning micturition	6.	Fever
3.	Hematuria	7.	Tenderness in renal angle
4.	Dysuria	8.	-

Table 9: Pre & post-kulattha therapy mean scores (modern system)* of ashmari patients

Parametre	BT	AT	%	CD (5%)	Parametre	BT	AT	%	CD (5%)
Pain	3.1	1.3	58.1	0.30 ¹	Nausea and vomiting	0.0	0.0	-	-
Burning micturition	1.7	1.1	35.3	0.30 ⁵	Fever	0.0	0.0	-	-
Hematuria	1.8	1.0	44.4	0.30 ¹	Tenderness in renal angle	0.8	0.3	62.5	0.38 ⁵
Dysuria	1.3	0.5	61.5	0.45 ¹	-	-	-	-	-

*K = Kulattha, SP = Sweta Parpati, BT, AT: Before, After treatment. Superscript 1, 5 indicate significant differences (BT-AT at 1% & 5% *p*-values respectively. Superscript ns indicate non-significant differences (BT-AT) at *p* = 5%. The differences (BT-AT) which are less than CD (0.05) value are non-significant (*p* > 0.05).

Effect of kulattha therapy on laboratory investigations: The results for hematological biochemical and urological parameters are presented in the Table 10. The Post-therapy results in comparison to Pre-therapy results showed an increasing trend in certain parameters while a decreasing trend in the others. The parameters, however, remained within

their *normal limits* both in the Pre and Post-therapy observations. But the extent of increase or decrease was statistically found to be non-significant (*p* > 0.05) in each case except *S. cholesterol*. The magnitudes of increase or decrease of AT values over the corresponding BT values were very small and are practically of little clinical significance.

Table 10: Laboratory tests of kulattha therapy group cases

Parameters	AT	BT	%	Parameters	AT	BT	%
Neutrophils*	56.7	54.5	-3.9	S. chloride	102.0	101.0	-0.1
Lymphocytes*	34.4	32.0	-7.0	S. calcium	9.2	9.2	0.0
Eosinophils*	4.1	3.9	-4.8	S. phosphate	3.7	3.6	-2.7
Monocytes*	6.0	6.1	+1.7	S. albumin	4.2	4.2	0.0
TLC*	8390.0	8640.0	+3.0	S. globulin	2.7	2.8	+3.7
ESR	14.8	15.3	+3.4	S. uric acid	4.3	4.4	+2.3
Hb gm%	10.3	10.4	+1.0	F. Blood sugar	80.1	85.0	+6.1
Blood urea L	29.7	26.9	-9.4	pH	4.7	4.78	+0.8
S. creatinine	0.94	0.95	+10.6	RBC*	1.4	1.2	-14.3
S. cholesterol	195.0	183.0	-6.2 <i>p</i> < 0.05	Pus Cells*	0.9	0.6	-33.3

*Count; %: Percent increase or decrease.

Probable mode of action: The ingredients in these therapies are having specific mode of action (Table 11) due to the presence of:

The following properties of the Ayurvedic drug Kulattha explain its efficacy in the management of Mutrashmari:

- The *Vatanulomana*, *sothahara* and *mutrala* properties of ingredients help to relieve pain and *sthanika sotha*.

- Deepana* property of drugs helps to increase the *agni*, which further check the formation of *Ama* at *Jatharagni* level itself.
- Pachana* property of ingredients help in assimilation of drugs in the body in case of *Jatharagnimandya*.
- Stone might be dissolved due to the *Asmari Bhedana* or *Asmarihara* property of ingredients present in the herb and in the mineral compound.

Table 11: Probable mode of action of the ingredients of kulattha

Vata	Pitta	Kapha	Dusya (Rasa- Mutra)	Agnimandya	Srotodusti	Mutravaha Srotodusti
Vedana sthapana	Daha Prasamana	Bhedana	Mutrala	Deepana	Sanga	Mutrala
Vatanulomana	Trsahara	Sothahara	Mutra virechaniya	Pachana	-	Mutra virechaniya
Sulaprasamana	-	Medohara	-	-	-	-

Conclusion

Overall success rate of Kulattha therapy remained at 63.3% [(Overall rating \times 100/maximum grade point of the scale)= $1.9 \times 100/3$]. Overall Complete Cure percentage remained at 33.3% while overall No Cure percentage remained at 8.4%. Its success rate can be improved further by prolonging the treatment further for some more time or by incorporating suitable herbal amendments. So, it can be concluded that Kulattha therapy possesses the properties regarding improvement, downward movement, disintegration and expulsion of stones and can produce almost total relief in sign and symptoms of both Ayurvedic and Modern systems of medicine of Mutrashmari. The results presented above establish the efficacy of Kulattha therapy in managing Mutrashmari with an Overall Success Rate of 63.3%. The present study could not present conclusive results on Pittaja ashmari for want of adequate data, therefore, more elaborate studies on this aspect stand indicated.

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