

**THE EFFICACY OF DECOCTION OF BERGENIA LINGULATA IN THE
MANAGEMENT OF UROLITHIASIS****Dr. Ardra B. Thorat***

Assistant Professor, Yashawant Ayurvedic College, Kodoli, Kolhapur, Maharashtra, India.

Corresponding Author: Dr. Ardra B. Thorat

Assistant Professor, Yashawant Ayurvedic College, Kodoli, Kolhapur, Maharashtra, India.

Article Received on 26/07/2018

Article Revised on 16/08/2018

Article Accepted on 06/09/2018

ABSTRACT

Urolithiasis is a common disease with an increasing incidence and prevalence worldwide. Life-time risk of Urolithiasis varies from 1-5% in Asia, 5-9% Europe, 10-15% USA and 20-25% middle-east. With its multifactorial etiology and high rate of recurrence, urinary track stone provide medical challenges. Therefore preventive medical therapy for recurrent Urolithiasis is the current need. The Decoction of *Bergenia lingulata* is selected for study as it was said to have the power of crushing the hardest calculus according to *Ayurveda*. The present study was undertaken to evaluate the efficacy of Decoction of *Bergenia lingulata*. The study was conducted on 40 patients. After clinical trial; the Decoction of *Bergenia lingulata* found to be effective in treating Urolithiasis.

KEYWORDS: Urolithiasis, Decoction of *Bergenia lingulata*.**INTRODUCTION**

In *Ayurveda* many Acharya's have been described in detail about various bodily systems. The Urinary system is one of them.^[1] In which one of the major disease is 'Urolithiasis'. Epidemiological surveys have been previously reviewed showing that in economically developed countries the prevalence rate ranged between 4% and 20%.^[2] Kidney stones are common in industrialized nations with an annual incidence of 0.5% to 1.9%.^[3] The prevalence of Urolithiasis is as high as 7.6% in Satpuda part of Maharashtra.^[4]

The risk factor includes metabolic syndrome complex such as obesity pose risks for urinary stone formation in children.^[5] Other risk factors involved in this geographical pattern are cultural practices such as the chewing of betel quid, which produces a high incidence of hypercalciuria and hypocitraturia.^[6] In the North Indian population the absence of *Oxalobacter formigenes*, an intestinal oxalate degrading bacteria, can lead to a significant increase in the risk of absorptive hyperoxaluria, resulting in recurrent episodes of calcium oxalate stones formation.^[7] Autosomal recessive inheritance was defined for cystinuria and primary hyperoxaluria., the reported prevalence for cystinuria is 1-5% of all patients with Urolithiasis and much lower for primary hyperoxaluria (~2 per million populations).^[8]

In the last two decades there have been great advances in the field of removal of stones which includes extracorporeal shock wave lithotripsy, percutaneous nephrolithotomy, ureteroscopy and much more. Taking into

consideration the multifactorial etiology and high rate of recurrence, urinary track stone provide medical challenges. The goal of the surgical treatment is the removal of existing stones while that of the medical treatment is prevention of recurrent stone formation. Equally important progress has been made in the medical arena.

There are so many *Ayurvedic* remedies, out of which Decoction of *Bergenia lingulata* is selected for study as it was said to have the power of 'crushing the hardest calculus'. The present study was undertaken to evaluate the efficacy of Decoction of *Bergenia lingulata* (decoction of *Pashanbheda*, *Varun*, *Gokshur*, *Brahmi*). The main aim of this particular study was inclined to assess the efficacy of 'Decoction of *Bergenia lingulata*' in the management of Urolithiasis.

AIMS AND OBJECTIVES

1. To assess the efficacy of 'Decoction of *Bergenia lingulata*' in the management of Urolithiasis.
2. To search the potent alternative of surgery for the disease Urolithiasis.
3. To establish the probable mode of action of 'Decoction of *Bergenia lingulata*' in the management of Urolithiasis.

MATERIALS AND METHOD**A. Selection of patient****1. Inclusive criteria**

- a. Age-patient between 15 to 60 years of age.
- b. Sex- Both males and females.

- c. All types of calculus in the kidney, ureter, and bladder.
 d. Calculus having size more than 5 mm.
 e. Both Recurrent and Newly diagnosed calculus.
 f. Both Unilateral and Bilateral calculus.
- b. Patients of renal failure.
 c. Diabetic nephropathy.
 d. Patients with retention of urine.
 e. Patient with congenital anomalies in urinary system.
 f. Patients having Tuberculosis, any type of Malignancies.
 g. Pregnant women.
 h. Any complication arises during the treatment or if any patient discontinuing the treatment was rejected.

2. Exclusive criteria

- a. Patients with impaired renal function, critical general condition who required immediate surgical/ medical management or hospitalization.

B. Selection of Drug

Table no 1: Contents of Decoction of *Bergenia lingulata*.

Sr. No	Name of the Drug (Ayurveda)	Family	Latin name
1	<i>Pashanbhed</i>	Saxifragaceae	<i>Bergenia Lingulata</i>
2	<i>Varun</i>	Cappariaceae	<i>Crataeva Nurvula</i>
3	<i>Gokshur</i>	Zygophyllaceae	<i>Tribulus Terrestris</i>
4	<i>Brahmi</i>	Scrophulariaceae	<i>Bacopa Monnieria</i>
5	<i>Shilajatu</i>		<i>Asphalatum Punjabinum</i>
6	<i>Karkatica</i>	Rutaceae	<i>Citrus maxima</i>
7	<i>Trapus</i>	Cucurbitaceae	<i>Cucumis Sativus</i>

Preparation of Decoction of *Bergenia lingulata*^[10]

It is a compound preparation contains decoction of 4 Ayurvedic drugs Pashanbheda (*Bergenia Lingulata*), Varun(*Crataeva Nurvula*), Gokshur(*Tribulus Terrestris*), Brahmi(*Bacopa Monnieria*). These four drugs are taken in equal quantity made into coarse powder. In 20 gm of this coarse powder, 320 ml (16 Parts) of water was added and boiled and reduced up to 1/8th (40 ml). This decoction was filtered. In this Karkatika(*Citrus maxima*), Trapus(*Cucumis Sativus*), Shuddha Shilajit (*Asphalatum Punjabinum*) coarse powder, all in ~2.5gm quantity was added and Jiggery 10 gm was added.

C. Methodology

- Group- One Trial Group
- No. of Patient - 40
- Drug -Decoction of *Bergenia lingulata*
- Duration- 60 days
- Route of drug administration -Oral
- Time - Before meal
- Dose - 40 ml BD
- Follow up - After 15, 30, 45, 60 days.
- Direction and diet- All patients were instructed to increase water intake, reduce the high protein diet.

❖ Subjective parameter

- Pain
- Dysuria
- Frequency of micturition at day.
- Nocturea
- Burning micturition.

❖ Objective Parameters

- Haematuria.
- Pyuria.

❖ Investigation

- Blood- a) Sr. creatinine b) Blood urea
- Urine – a) Routine b) Microscopic
- Sonological- Before and after treatment. a) Ultrasonography (Abdomen and pelvis).

❖ Grading scale of Subjective and Objective parameters

a. Pain

- No pain
- Occasional pain not required treatment
- Occasional pain required treatment and get relief
- Constant dull ache/pain required treatment but can not get relief
- Constant severe pain required treatment but did not show any relief.

b. Haematuria

- No R.B.C./HPF
- 0-5 R.B.C./HPF
- 6-10 R.B.C./HPF
- 11-15 R.B.C./HPF
- >16 R.B.C./HPF.

c. Pyuria

- No pus cells/HPF
- 0-5 pus cells/HPF
- 6-10 pus cells/HPF
- 11-15 pus cells/HPF
- >16 pus cells/HPF

d. Dysuria

- No dysuria
- Occasional dysuria not required treatment
- Occasional dysuria which required treatment
- Constant severe dysuria required treatment

5. Constant severe dysuria but did not show relief after treatment.

e. Frequency of micturition

1. 4-5 times a day, nocturia once
2. 6-7 times a day, 1-2 times nocturia
3. 8-9 times a day, 2-3 times nocturia
4. >10 times a day, >4 times nocturia.

f. Burning Micturition

1. No burning micturition
2. Occasional burning micturition which required no treatment.
3. Occasional burning micturition which required treatment.
4. Constant burning micturition required treatment
5. Constant severe burning micturition required treatment but did not show any improvement.

❖ **Criteria for assessment**

1. Complete absence of signs and symptoms= 1
2. Presence of signs and symptoms in mild degree=2
3. Presence of signs and symptoms in moderate degree=3
4. Presence of signs and symptoms in severe degree=4
5. Acute condition of signs and symptoms=5.

❖ **Assessment of Clinical Result**

1. Excellent improvement- More than 75% relief.
2. Marked improvement- 51%-75% relief.
3. Moderate improvement- 25% -50% relief.
4. Mild improvement – 1%- 25% relief.
5. No improvement- No relief.

OBSERVATIONS AND RESULTS

The results of the study are based on assessment of subjective and objective parameters, which has been compiled along with Z test.

Table No 2: Effect of Therapy on Subjective and Objective Parameters of 40 patients of Urolithiasis.

Sr. No.	Parameters	Mean		MR	% Relief	SD _a	SE _d	Z _{cal}
		BT	AT					
1.	Frequency	3.3	1.4	1.9	57.58	0.59	0.093	20.33**
2.	Burning	3.62	1.4	2.225	61.4	0.65	0.10	21.31**
3.	Pain	4.22	1.75	2.475	58.6	0.598	0.09	26.13**
4.	Dysuria	2.82	1.1	1.725	61.1	0.81	0.129	13.35**
5.	Haematuria	3	1.07	1.925	64.17	1.685	0.0266	7.21**
6.	Nocturia	2.87	1.1	1.77	61.74	0.53	0.08	21.14**
7.	Pyuria	2.6	1.1	1.5	57.69	1.48	0.23	6.38**

** Highly significant (Significant at 0.1 %, P < 0.001)

Table No 3: Effect of Therapy on Objective Parameters of 40 patients of Urolithiasis.

Sr. No.	Objective parameter	Mean		MR	% Relief	SD _a	SE _d	Z _{cal}
		BT	AT					
1.	Blood Urea	26.1	22.86	3.225	12.35	3.442	0.544	5.91**
2.	Sr.Creatinine	0.975	0.84	0.127	13.1	0.216	0.03	3.72**
3.	Size of calculus	11.50	7.24	3.34	47.11	2.9	0.40	8.22**

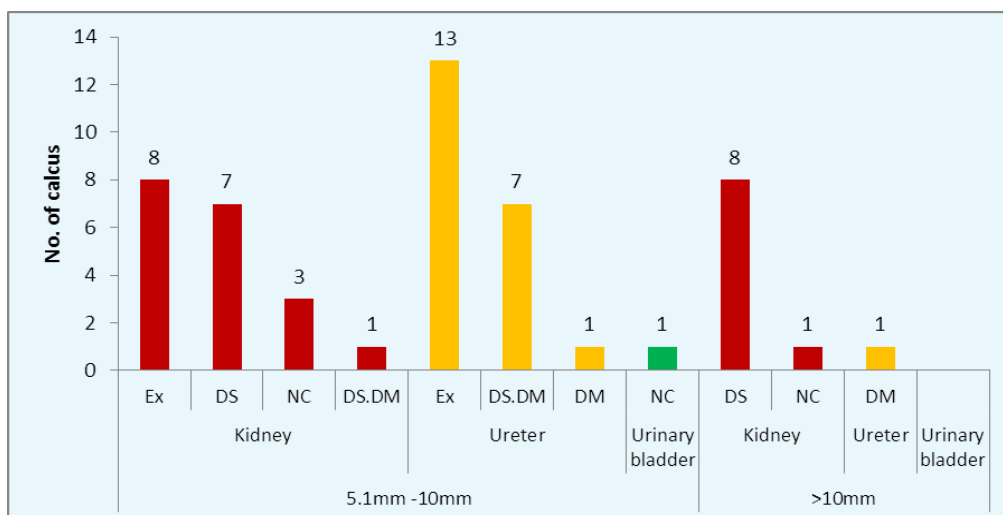
** Highly significant (Significant at 0.1 %, P < 0.001)

Table No. 4: Effect of therapy on stones at different site and size in 40 patients of Urolithiasis.

Size	Site	No of Calculus	Effect
5.1mm -10mm	Kidney	8	Ex
		7	DS
		3	NC
		1	DS.DM
	Ureter	13	Ex
		7	DS.DM
		1	DM
Urinary bladder	1	NC	
>10mm	Kidney	8	DS
		1	NC
	Ureter	1	DM
	Urinary bladder		

*some patients were having more than one stone at different sites.

Key of observations: NC: No change, Ex. : Expelled, DM: Downward movement, DS: Decrease in size.



Dia.No.1: Effect of therapy on stones at different site and size in 40 patients of Urolithiasis.

DISCUSSION

A. Probable Mode of Action of Decoction of *Bergenia lingulata*

According to Chemical Composition

- Bergenin and β -sitosterol have been isolated from the roots of Pashanbheda other compound reported from roots are gallic acid, tannic acid, glucose and bergenin, afzelechin, aminoacids, metarbin. The action of these alkaloids is diuretic, hypermangeseuric and antioxidant.^[11]
- Bark of Varun contains saponin, tannin, lupeol, sitosterol and stearic acid. A mixture of other fatty acids (C20, C22, C24, C26) were isolated from the root bark. He root and bark are laxative and lithotryptic. Alkaloids of Root and bark useful in urinary complaints like stone, fever and vomiting.^[12]
- From the fruits and leaves of Gokshur - flavonoid compounds like kaempferol, kaempterol-3, glucoside, kaemperol-3, rutinoid and a new acylated steroid, saponenins - 5, neotigogenin and hecogenin have also been reported. Plant and spiny fruit contains fair amount of nitrates hence act as diuretic. The plant esteemed as cooling, demulcent, diuretic, tonic and aphrodisiac.^[13]
- From Brahmi alcoholoid- bramhin and herpestin, Saponin - bacoside A- (aerbinosile glucose & a.bacogenine) and bacoside - B. It reconciles vitiated pitt in urinary ailments burning, bleeding, pain as it is diuretic used in dysuria and urinary calculi.
- The chief active substances in Shilajit are benzoic acid and benzoates (Chopra 1958) which act as diuretic, lithotropic, antiseptic, tonic, rejuvenative (Frawley 2001).
- The Seeds of Karkatika are used in dysuria, irritation of urinary tract, cystitis, reduce specific gravity of urine. Its flower, leaves, rind has sedative action in nervous affection.
- Seeds of Trapush are used in dysuria, irritation of urinary tract, cystitis, reduce specific gravity of urine.^[14]

CONCLUSION

- Decoction of *Bergenia lingulata* possesses the properties regarding the disintegration and expulsion of Mutrashmari less than 10 mm.
- Also the urinary calculus more than 10 mm and large stag horn calculus show partial decrease in size with symptomatic relief to the patients.
- The Decoction of *Bergenia lingulata* possesses the property of recovery of renal parenchymatus damage due to calculus.
- Decoction of *Bergenia lingulata* is very safe and easy to use. No clinically significant adverse reactions were reported during entire study period.

REFERENCES

- Sushruta, Sushruta Samhita, Edited by Kaviraj Ambikaduttashashtri, Published by chaukhambha Sanskrit sanshan, 8th Edition 1993; Su.Sha 9/12; pp 72.
- Trinchieri A. Epidemiology of Urolithiasis. Arch Ital Urol Androl, 1996; 68: 203-250. [PubMed].
- Hesse A, Reliable data from diverse regions of the world exist to show that there has been a steady increase in the prevalence of Urolithiasis. World J Urol, 2005; 23: 302-303. [PubMed].
- Journal of association of physician of India, May 2011.
- Lee SC, Impact of obesity in patients with Urolithiasis and its prognostic usefulness in stone recurrence. J Urol, 2008; 179: 570-574. [PubMed].
- Allen SE, Singh S, Robertson WG. The increased risk of urinary stone disease in betel quid chewers. Urol Res., 2006; 34: 239-43. [PubMed].
- Kaufman DW, Kelly JP, Curhan GC, Anderson TE, Dretler SP, Preminger GM, Cave DR, Oxalobacter formigenes may reduce the risk of calcium oxalate kidney stones. J Am Soc Nephrol, 2008; 19: 1197-1203.
- Petrarulo M, Vitale C, Facchini P, Marangella M., Biochemical approach to diagnosis and

- differentiation of primary hyperoxalurias: an update. *J Nephrol*, 1998; 11: S23–S28.
9. Vangasen Samhita (Chikitsar sangrah), edited by P Hariprasad Tripathi, Ashmari rogadohikarkar, Prach prakashan, Varanasi, 1st Reprint 2009, Ashmarirogadohikar 73/64,65: pp802.
 10. Sharangdhar, sharangdhar samita, comented by Shailaja Shrivastava, Chaukhambha orientalia, Reprint edition-2009, Madhyam Khand ,Kwath kalpana 2/1,2 pp 135.
 11. Dr. K. M. Nadkarni's Indian Materia Medica vol.1, revised and enlarged by A.K.Nadkarni, Bombay Popular Prakashan private Lit. Reprint of 3rd edition, 1 sep 1982; pp 1113.
 12. Dr. K. M. Nadkarni's Indian Materia Medica vol.1, revised and enlarged by A.K.Nadkarni, Bombay Popular Prakashan private Lit. Reprint of 3rd edition, 1 sep 1982; pp 387-388.
 13. Dr. K. M. Nadkarni's Indian Materia Medica vol.1, revised and enlarged by A.K.Nadkarni, Bombay Popular Prakashan private Lit. Reprint of 3rd edition, 1 sep 1982; pp 1229-1231.
 14. Dr. K. M. Nadkarni's Indian Materia Medica vol.1, revised and enlarged by A.K.Nadkarni, Bombay Popular Prakashan private Lit. Reprint of 3rd edition, 1 sep 1982, pp 403,404.