Research Article

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ROLE OF VRIHAT VARUNADI KWATH GHAN VATI IN THE MANAGEMENT OF ASHMARI WITH SPECIAL REFERENCE TO UROLITHIASIS

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ABSTRACT

Urolithiasis is one of the most common disease of urinary system and very difficult to manage due to its multifactorial etiology, high recurrence rate, worldwide increasing incidences and prevalence. In Ayurveda, urolithiasis is described as Ashmari. It has been included in Ashta Mahagada by Acharya Sushruta. In the present research “Role of Vrihat Varunadi kwath ghan vati in the management of Ashmari with special reference to Urolithiasis” has been evaluated. Total 30 patients were selected randomly in one group and treated with trial drug. Drug showed statistically highly significant results on pain, tenderness at renal angle and urinary obstruction. Statistically significant results were obtained on burning micturition, pyuria and dysuria. Statistically non significant results were obtained on haematuria, vomiting and nausea. Out of 30 patients, 16 patients (53.34%) were cured, 1 patient (3.33%) was markedly improved, 4 patients (13.33%) were moderately improved, 3 patients (10%) were mildly improved and 6 patients (20%) remained unchanged. Drug was significant to decrease TLC and neutrophils count. Variations in all other haematological, biochemical values and urine pH were observed within normal range. Moreover, the therapy was well accepted by all patients & produced no side effect during study period. So it can be concluded that Vrihat Varunadi kwath ghan vati has significant effect on sign, symptoms, size of urolithiasis and prevents recurrence of disease without any side effect.

Keywords: Ashmari, Ashta Mahagada, Vrihat Varunadi kwath ghan vati

INTRODUCTION

Acharya Sushruta first reported in his text Sushruta-samhita about stone removal techniques. Thus urolithiasis description is the specific contribution of Acharya Sushruta. Since this disease is grievous, so considered as one of the Ashta mahagadas¹ by Acharya Sushruta, may be due to its high potentiality to affect the urinary system. Urinary metabolic abnormalities such as low urine volume, hypercalciuria, hyperoxaluria, hyperuricosuria and hypocitraturia predispose a patient to early recurrence. Despite intensive studies in the last decade about many aspects of urolithiasis, the complete pathogenesis and thus prevention, still remains to be clarified. In modern science, various treatment modalities are used to treat urolithiasis nowadays but the medical treatment is ineffective and surgical techniques are costly, having complications. Even modern treatment is also not sufficient to stop recurrence of urolithiasis. It has created an impetus for further research in the light of Ayurvedic knowledge. Many Ayurvedic drugs have been employed since ages to treat urinary stones. The rationale behind their use is not well established through systematic and pharmacological studies, except for some drugs. In view of these problems, it is a desperate need for research on this topic. Keeping these things in mind, we are in need to find out some conservative treatment of Ashmari which is advantageous, safe and has minimal chances of recurrence.

Aims And Objectives

To study the antiurolithiatic activity of Vrihat Varunadi kwath ghan vati given orally and to find out the efficacy of trial drug in the management of urolithiasis

MATERIALS AND METHODS

Current study “Role of Vrihat Varunadi kwath ghan vati in the management of Ashmari with special reference to Urolithiasis” was carried out in the Department of Shalya Tantra, Rishikul Campus, Haridwar, Uttarakhand Ayurved University after taking informed consent from the patients. Present study was carried out in accordance with ethical principles by following International conference of Harmonization-Good Clinical Practices Guidelines (ICH-GCP). Ethical clearance was obtained from the institute.

Inclusion Criteria

Patient of either sex, aged between 15 to 60 years, having radiological evidence of stone (up to 8mm size) in kidney, ureter or urinary bladder.

Exclusion Criteria

Patient aged below 15 & above 60 years, having stone size >8mm, gross hydronephrosis, pyelonephritis, impaired renal function, diabetes mellitus or known systemic disorders.

Subjective Parameters

Pain, burning micturition, dysuria, tenderness at renal angle, haematuria, pyuria, urinary obstruction, vomiting and nausea.

Objective Parameters

Size of stone assessed by USG whole abdomen (KUB region) or by Plain X-ray abdomen (KUB region), haematological examination, serum biochemistry and urine analysis.

Composition of Trial Drug²-

Trial drug contains Varuna (*Crataeva nurvala*), Kulattha (*Dolichos biflorus*), Gokshura (*Tribulus terrestris*), Shunthi (*Zingiber officinale*), Taalmooli (*Curculigo orchoides*), Ikshu (*Saccharum officinarum*), Kush (*Desmostachya bipinnata*), Darbha (*Imperata cylindrica*), Kaash (*Saccharum spontaneum*), Shar (*Saccharum munja*), Yavakshara (Alkali preparation of barley) and Sharkara (glucose).

Drug Source: Required raw ingredients were selected. Preparation of the drug was done in Ayurvedic mini pharmacy of Rishikul Campus, Haridwar, Uttarakhand Ayurved University, with the help of some external sources.

Study Design

Type of Study: Single blind

Period of Study: Duration of trial was 3 months.

Route of Administration: Oral

Dose: 1 Tab BD or 2 Tab BD (each tab = 500 mg), depends on age and body weight of patient.

Observation during treatment: At an interval of 1 month till the completion of trial.

Diet-All the patients were advised to take plenty of water and desist from the diets which are contributory to the formation of stone.

Follow up after treatment: After completion of treatment, patients were instructed to have regular check up at an interval of 1 month for the period of 2 months.

Assessment of overall effect of the therapy-The result thus obtained from individual patient was categorized according to the following grades:

Cure -100% relief, Marked improvement $\geq 75\%$ up to 99% relief, Moderate improvement $\geq 50\%$ up to 74% relief, Mild improvement $\geq 25\%$ up to 49% relief, Unchanged $\leq 25\%$ relief.

RESULT

The efficacy of the therapy was adjudging on subjective & objective parameters and the results were derived after execution of statistical analysis.

Statistically highly significant ($p < 0.001$) results were obtained on pain, tenderness at renal angle and urinary obstruction. Statistically significant ($p < 0.01$) results were observed on burning micturition, dysuria and pyuria while statistically non significant ($p > 0.05$) results were found on haematuria, vomiting and nausea (Table 1).

A decrease was observed in blood urea level (1.21%), sr. creatinine level (5.8%), sr. calcium level (3.1%), sr. phosphorus level (0.35%) and uric acid level (2.54%) which is statistically non-significant. An increase was observed in sr. potassium level (3.40%), % Hb (9.75%) and urine ph (1.26%) which is statistically non-significant. A decrease was observed in TLC (6.64%) and neutrophils count (9.40%) which is statistically significant (Table 2).

The data of the present study reveals that out of 30 patients, 16 patients (53.34%) were cured, 1 patient (3.33%) was markedly improved, 4 patients (13.33%) were moderately improved, 3 patients (10%) were mildly improved and 6 patients (20%) remained unchanged (Table 3-4).

All 30 patients completed their follow up period and no patient was reported with recurrence. No side effects were reported during the study period

Table 1: Effect of therapy on subjective parameters

Subjective parameters	Mean		Mean diff	% relief	SD	SE	t-value	p- value	Significance
	BT	AT							
Pain	1.9	0.30	1.6	84.21	1.06	0.19	8.19	<0.001	HS
Burning micturition	0.86	0.43	0.43	50	0.67	0.12	3.49	<0.01	S
Dysuria	0.6	0.2	0.4	66.66	0.62	0.11	3.52	<0.01	S
Tenderness at renal angle	0.66	0.03	0.63	95	0.92	0.16	3.73	<0.001	HS
Haematuria	0.6	0.3	0.2	33.33	0.55	0.10	1.98	>0.05	NS
Pyuria	0.5	0.2	0.3	60	0.46	0.08	3.52	<0.01	S
Urinary obstruction	0.5	0.06	0.46	93.33	0.50	0.09	5.03	<0.001	HS
Vomiting	0.2	0.1	0.1	50	0.30	0.05	1.79	>0.05	NS
Nausea	0.2	0.1	0.1	50	0.30	0.05	1.79	>0.05	NS

BT: Before Treatment, AT: After Treatment

Table 2: Effect of therapy on objective parameters

Investigation	Mean		±S.D	S.E.	% change	t-value	p-value	Significance
	BT	AT						
B.urea (mg/dl)	32.49	30	1.19	0.21	1.21	1.80	>0.05	NS
Sr.creatinine (mg/dl)	1.03	0.97	0.18	0.03	5.8	1.81	>0.05	NS
Sr.calcium (mg/dl)	5.04	5.00	0.44	0.08	3.1	1.91	>0.05	NS
Sr.phosphorus (mg/dl)	3.75	3.74	0.42	0.07	0.35	0.17	>0.05	NS
Sr. potassium (mEq/L)	4.30	4.45	0.17	0.03	-3.40	-4.62	>0.05	NS
Uric acid mg/dl	5.77	5.62	0.42	0.07	2.54	1.88	>0.05	NS
% Hb	12.3	13.5	0.96	0.17	-9.75	-6.8	>0.05	NS
TLC/ microL	7470	6980	762.70	139.24	6.64	3.56	<0.01	S
Neutrophils%	67	60.7	9.53	1.74	9.40	3.62	<0.01	S
Urine ph	6.04	6.16	0.25	0.04	-1.26	-1.66	>0.05	NS

BT: Before Treatment, AT: After Treatment

Table 3: Effect of therapy on types of ashmari (as per site) in 30 completed patients

Variety	Number of stones	Effect in %
Kidney stone	20	
Cured	12	60
Markedly improved	0	0
Moderately improved	3	15
Mild improved	1	5
Unchanged	4	20
Ureter stone	6	
Cured	4	66.6
Markedly improved	1	16.7
Moderately improved	0	0
Mild improved	1	16.7
Unchanged	0	0
Kidney stone with Ureter stone	4	
Cured	0	0
Markedly improved	0	0
Moderately improved	1	25
Mild improved	1	25
Unchanged	2	50
Bladder stone	0	0
Cured	0	0
Markedly improved	0	0
Moderately improved	0	0
Mild improved	0	0
Unchanged	0	0

Table 4: Overall effect of therapy on 30 completed patients of ashmari

Result of therapy	Number of patients	Effect in Percentage
Cured	16	53.34
Markedly improved	1	3.33
Moderately improved	4	13.33
Mild improved	3	10
Unchanged	6	20

DISCUSSION

According to Acharya Sushruta, either vaatyaakta kapha, pitta yakta kapha or only kapha get aggravated in the persons who do not undergo shodhana procedures regularly and use unwholesome diet. It then enters into basti, mixes with mutra and takes the shape of an Ashmari³.

According to Acharya Charaka, vaayu dosha plays an important role for sthana samsraya of Kapha for Ashmari formation⁴. Thus kapha is main dosha responsible for Ashmari formation. In modern science also, stones are formed by aggregation of various urinary crystals due to imbalance between stone promoters and inhibitors in kidney. So the drug used for the treatment of Ashmari should possess the properties of correcting underlying pathology and balancing the vitiated doshas. Vrihat Varunadi kwath ghan vati is one of such drug. Shoolprashmana property (due to Shunthi⁵-*Zingiber officinale*) and Shothhara property (due to Shunthi-*Zingiber officinale* and Kulattha-*Dolichos biflorus*) help in relieving pain and tenderness at renal angle. Daahprashman property (due to Kaash-*Saccharum spontaneum*, Shar-*Saccharum munja* and Sharkara-glucose), Bastirujanashak property (due to Kush-*Desmostachya bipinnata* and Darbha⁶-*Imperata cylindrica*), Bastishodhan property (due to Gokshura⁷-*Tribulus terrestris*), Krimighna property (antimicrobial activity due to Varuna-*Crataeva nurvala* and Kulattha-*Dolichos biflorus*) prevent burning micturition, dysuria and pyuria. Urinary obstruction is relieved by Mutral property (due to Varuna-*Crataeva nurvala*, Kaash-*Saccharum spontaneum*, Gokshura-*Tribulus terrestris*, Ikshu-*Saccharum officinarum*, Kush-*Desmostachya bipinnata*⁸ and Darbha-*Imperata cylindrica*), Saarak property (due to Kaash-*Saccharum spontaneum* and Kulattha-*Dolichos biflorus*) and Vibandhnashak property (due to Shunthi-*Zingiber officinale*).

Ingredients of Vrihat Varunadi kwath ghan vati having cumulative effect to reduce the size of the stone or making it easy to expel out

Ashmaribhedana property is due to Prabhava of Varuna (*Crataeva nurvala*), Kulattha (*Dolichos biflorus*), Gokshura (*Tribulus terrestris*), Kush (*Desmostachya bipinnata*), Darbha (*Imperata cylindrica*) and Kaash (*Saccharum spontaneum*). Chhedan, Bhedan, Lekhan properties are due to Prabhava of Yavakshara (Alkali preparation of barley).

Kapha shoshan property is due to Tikta rasa, Kashaya rasa, Laghu guna and Ruksha guna of Varuna (*Crataeva nurvala*) along with Kapha shoshan property of Laghu guna and Ruksh guna of Kulattha (*Dolichos biflorus*). As Kapha is main dosha responsible for Ashmari formation, Varuna (*Crataeva nurvala*) and Kulattha (*Dolichos biflorus*) directly inhibit stone formation by Shoshan of this Kapha.

Deepan and Pachan property of Varuna (*Crataeva nurvala*) and Shunthi (*Zingiber officinale*) respectively increases bala of agni due to Ushna virya. Thus by preventing formation of aama, they reduce kapha which is responsible for Ashmari formation.

Tridoshnashak property is present in Kush (*Desmostachya bipinnata*), Darbha (*Imperata cylindrica* -Vaatanashak due to Snigdha guna, Pittanashak due to Madhura rasa with Sheet virya and Kaphanashak due to Kashaya rasa) and Shar (*Saccharum munja* -Vaatanashak due to Snigdha guna, Pittanashak due to Madhura rasa with Sheet virya and Kaphanashak due to Tikta rasa). As Ashmari is Tridoshaj vyadhi, Kush (*Desmostachya bipinnata*), Darbha (*Imperata cylindrica*) and Shar (*Saccharum munja*) directly prevent Ashmari formation by balancing the vitiated Tridosha.

Kapha Vaat shamak property is due to Ushna virya of Varuna (*Crataeva nurvala*), Kulattha (*Dolichos biflorus*), Shunthi (*Zingiber officinale*) and Yavakshara (Alkali preparation of barley).

As Vaayu dosha plays an important role for Sthana samshraya of Kapha for Ashmari formation, Varuna (*Crataeva nurvala*), Kulattha (*Dolichos biflorus*), Shunthi (*Zingiber officinale*) and Yavakshara (Alkali preparation of barley), balance the vitiated Vata and Kapha thus prevent stone formation.

Chemical constituents of ingredients of Vrihat Varunadi kwath ghan vati responsible for reducing the size of the stone or make it easy to expel out

Lupeol present in Varuna⁹ (*Crataeva nurvala*), Ikshu¹⁰ (*Saccharum officinarum*) is having antioxidant & antiurolithiatic activity. Lupeol linoleate¹¹ and betulin¹² present in Varuna (*Crataeva nurvala*) are antioxidant. An antilithiatic protein (98 kDa) present in Kulattha (*Dolichos biflorus*) is having antiurolithiatic activity¹³.

40 antioxidants including [6] gingerol, [6]-Dehydroshogaol, [6]-shogaol, 1-dehydro-[6]-gingerdione¹⁴ and essential oil¹⁵ present in Shunthi (*Zingiber officinale*) are having antioxidant activity. Triterpene present in Taalmooli (*Curculigo orchoides*) is antiurolithiatic¹⁶.

Phenolic compounds and flavonoid present in Kaash (*Saccharum spontaneum*) are antioxidant in property¹⁷. Terpenoids and flavonoids present in Shar (*Saccharum munja*) are having antiurolithiatic and antioxidant activity¹⁸ respectively.

Alkaline nature of Yavakshara (Alkali preparation of barley) is antiurolithiatic¹⁹.

In spite of antiurolithiatic activity, other activities like antioxidant, diuretic, antimicrobial and anti-inflammatory activity of various ingredients of Vrihat Varunadi kwath ghan vati also help in expulsion of stone and reduction in size of stone. No patient was reported with recurrence due to Kaphashoshak, Tridoshnashak, antioxidant, anti-inflammatory and antimicrobial activity of some of the contents of Vrihat Varunadi kwath ghan vati.

CONCLUSION

The study suggested that Vrihat Varunadi kwath ghan vati is effective for relieving pain, tenderness at renal angle, urinary obstruction, burning micturition, pyuria and dysuria. The overall effect of trial drug shows that 53.34% patients were cured completely. It indicates effectiveness of Vrihat Varunadi kwath ghan vati on urolithiasis due to presence of Ashmaribhedana, Mutral, Saarak, Chhedan, Bhedan, Lekhan, Vibandhnashak, Bastirujanashak, Bastishodhan, Shoolprashmana, Shothhara, etc., properties.

So, here it can be concluded that Vrihat Varunadi kwath ghan vati possesses the properties regarding disintegration and expulsion of stones and can produce relief in sign and symptoms of Ashmari without producing any adverse effects. It is also cost effective and easy to use. Hence, it can be used as an alternative approach for management of Ashmari.

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