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LITHOTRIPTIC ACTIVITY OF *SWADAMSTRADI KWATHA* & *SWADAMSTRADI GHANA VATI* AN EXPERIMENTAL EVALUATION

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Urolithiasis is still a mysterious disease even after extensive research in Urology. Sophisticated instruments, investigations etc. have failed to trace out the exact cause and mechanism of urolithiasis. But, few researches conducted in recent times revealed various factors, which are responsible in manifesting this condition.

The treatment for this condition in modern medicine is not only expensive but also not easily affordable to the needy poor. Actually, there are no satisfactory drugs in modern medicine, which can dissolve the stone and the physicians depend on alternative systems of medicine for better relief.

Mentionings of this disease can be traced back to the dawn of the history. In Ayurveda, this condition is described as Ashmari and is considered as most dreadful disease. Fortunately, this system holds a number of herbal, herbo mineral compounds, which are effective, safe and economical too.

One of such compounds, Swdamstradi Kwatha mentioned by Chakradatta, Ashmari Chikitsa 32/27, was selected for the present study to scrutinize its actual therapeutic values in case of Urolithiasis. The study conducted in experimental animals has given encouraging results.

Introduction

Urolithiasis, the third most common disorders of urinary tract has worldwide distribution. It became a major health problem affecting nearly about 12% of

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males and 5% of females. This statistical numerical reveals the gravity of the disease in the present scenario. In spite of availability of sophisticated instruments and developed technology, the modern field of medicine could not contribute much in the treatment of urinary calculi. Many times surgery becomes the last resort of treatment, which is painful, not economical and moreover leaves chances of various complications. Because of all these, inclination of the pendulum of suffering population with urolithiasis is observing towards alternative systems of medicine, particularly towards Ayurveda.

Ancient seers of Ayurveda were well familiar with this condition and labeled it as *ASHMARI* and grouped it under *Asta-mahagada* (8 dangerous diseases). This dangerous condition is compared with the God of Death - *YAMA*. It can be cured by medicines in early stages, but in later stages surgery is needed (Su.Chi.7/3). The age-old science has ample of examples of potential and effective drugs, which can be used successfully in the management of *ASHMARI*. Even though these remedies are well established, scientific and time tested; there is always a necessity for evaluating the therapeutic significance through modern scientific parameters. After scrutinizing a number of drugs, a compound formulation "*Swadamshtradi Kwatha*" has been selected from Chakradatta Ashmari Chikitsa 32/27 and decided to evaluate its actual significance in the management of Urolithiasis.

Objectives

1. To study the Urolithotryptic activity of *Swadamshtradi Kwatha* and *Swadamshtradi Ghana Vati* through experimental sources.
2. To evaluate the better drug in between these two formulations.

Materials & Methods

1. Drug

- The present trial drug *Swadamshtradi Kwatha* has been selected from *Chakradatta* [Ashmari Chikitsa 32/27]
- As the *Ghana Vati* is supposed to be more efficacious and advantageous than other dosage forms like *Kashaya* etc. It is planned to prepare *Swadamshtradi Ghana Vati.*

Composition of the drug

The trial drug is made up of *Goksura, Shunthi, Eranda patra* and *Varuna.*

2. Practical study

Practical - i

Preparation of *Kashaya*

All parts of the ingredients (Table-I) are grounded to coarse powder and added with 4 parts of water. The contents were

Table No. I

Sl. No.	Ingredient	Latin Name	Part used	Proportion of the drug
1.	*Goksura*	*Tribulus terrestris*	Fruit	1 part
2.	*Shunthi*	*Zinziber officinale*	Rhizome	1 part
3.	*Eranda*	*Ricinus communis*	Leaf	1 part
4.	*Varuna*	*Cratevia nurvala*	Bark	1 part

subjected to moderate heat and reduced to 1/4th, filtered through a clean cloth and used for experimental purpose.

Practical ii

Preparation of *Ghana Vati*

Swadamstradi Kashaya was prepared and it was filtered through a clean cloth. The obtained filtrate was re-boiled till it gets semisolid consistency. The mass thus obtained was rolled into pills with the help of tablet cutting machine, dried in shade and preserved for experimental purpose.

3. Experiment

i. Method Adopted

Foreign body Insertion Technique, developed by Vermeulen *et al.*, 1950; Vermeulen, 1962

ii) Animals: Male albino rats.

iii) Inclusion Criteria:

- Male rats.
- Weighing in between 150 to 200gms.
- Active and healthy rats.

iv) Exclusion criteria:

- Female and gravid rats.
- Weighing below 150 gms and above 200gms.
- Diseased rats.
- Rats already under use for other experiments.

v) Grouping: (Table-II)

Table II

Sl.No.	No.of Rats	Group		Drug	Purpose
1.	6	G_1- Control	Distilled water.	To serve as Prophylactic Control	
2.	6	G_2 - Trial-I	*Swadamshtradi Kwatha*	To bring about Urolithotriptic effect	
3.	6	G_3 - Trial-II	*Swadamshtradi Ghana vati*	To bring about Urolithotriptic effect	

v) Brief Description of the Experiment

The Rat was anaesthetized with Ketamine 120mg/kg intra-peritoneally and was brought to the dissection block. The hair on lower abdomen was removed with hair removing cream. The area was washed with soap water. The animal was fixed in supine position to the dissection block by tying its limbs with thread to the block.

A vertical incision measuring less than one centimeter was made over the supra pubic area in the middle, a few millimeters above the roof of the penis.

The abdomen was opened in layers and the urinary bladder was traced out. On either side, the bladder was held carefully by means of fine blunt forceps causing minimum of tissue injury. A small incision just sufficient to allow the bead was made very carefully in the bladder and a foreign body [Zinc bead weighing 25 mg. each] was inserted in to the bladder of each rat by means of fine forceps. With two stitches the incision of the bladder was closed.

The bladder was placed back in to the position. The skin was sutured and the lesion was applied with tincture iodine.

The animal was placed back in to the concerned cage. The same procedure was adopted for all the rats used in this experiment.

Experimental protocol

Table III Dose fixation: The rat dose was calculated based on the conversion formula: Rat dose = 0.018 x Human dose x 5

Drug Schedule

All the rats were kept on normal diet and water for 7days. No medicine was given during the period. On 8th day the rats were anaesthetized and urinary bladder

Table III

Sl. No.	Group	Drug	Dose /200gms. Wt	Duration
1.	Control	Distilled water	4.5 ml	4 weeks
2.	Trial-I	*Swadamshtradi Kwatha*	4.5 ml	4 weeks
3.	Trial-II	*Swadamshtradi Ghana Vati*	45 mg	4 weeks

was opened to collect the formed stone. After weighing the stone it was replaced into the bladder. Visceral and abdominal layers were sutured accordingly. From 8th day onwards the drug was administered at appropriate dose for 4 weeks.

Criteria for assessment of the results

The differences of the weight of the zinc disc, before insertion and after the treatment schedule were weighed. The difference will give the weight of stone formed. These values were subjected to statistical analysis in order to evaluate the efficacy of the compounds.

Results

Control group

The mean wt of Foreign Body found in Control group was 796.66 mg. and in Trial group I was 181.66mg. The t value found in this experiment was 63.47, suggests that *Swadamshtradi Kwatha* is highly significant with a p-value at <0.001 over control group.

The mean wt of Foreign Body found in Control group was 796.66 mg. and in Trial group II was 25.83 mg. The t value found in this experiment was 94, which suggests the highly significant activity of *Swadamshtradi Ghana Vati* with a p-value at <0.001 over control group.

Table IV

Weight of Foreign Body before & after treatment

Sl. No.	Wt. of Foreign Body in mg.			Wt. of calculi
	Initial	On 8th day (BT)	After 5 wks (AT)	in mg.
1.	25	375	820	795
2.	25	395	840	815
3.	25	355	800	775
4.	25	375	840	815
5.	25	385	830	805
6.	25	365	810	775

Mean = 796.66 & SD = 18.35

The mean weight of the calculi before treatment was 375 mg. & at the end of the treatment the mean weight found was 796.66 mg.

Trial Group I

Table V
Weight of Foreign Body before & after treatment

Sl. No.	Wt. of Foreign Body in mg.			Wt. of calculi
	Initial	On 8th day (BT)	After 5 wks (AT)	in mg.
1.	25	395	220	195
2.	25	395	200	175
3.	25	385	190	165
4.	25	375	230	205
5.	25	385	200	175
6.	25	365	200	175

Mean = 181.66 & SD = 15.05

The mean weight of the calculi observed before treatment was 383.3 mg & at the end of the treatment it was 181.66 mg. It indicates that the *Swadamstardi Kashaya* has a very good role in preventing the formation of Renal Calculi.

Trial Group II

Table VI
Weight of Foreign Body before & after treatment

Sl. No.	Wt. of Foreign Body in mg.			Wt. of calculi
	Initial	On 8th day (BT)	After 5 wks (AT)	in mg.
1.	25	385	50	25
2.	25	415	50	25
3.	25	340	45	20
4.	25	370	40	15
5.	25	385	65	40
6.	25	395	55	30

Mean = 25.83 & SD = 8.6

The mean weight of the calculi observed before treatment was 381.6 mg. & at the end of the treatment it was 25.83 mg. which indicates the highly significant therapeutic attributes of the trial drug, *Ghana Vati.*

Table VII
The Mean weight of Foreign Body and SD values of 3 groups

Sl. No.	Groups	Mean of calculi after treatment	SD
1.	Control	796.66	18.35
2.	Trial group I	181.66	15.05
3.	Trial group II	25.83	8.6

Table VIII
Comparison in between Groups

Sl. No.	Groups	t - value	P - value
1.	G_1 G_2	63.47	0.001
2.	G_1 G_3	94	0.001
3.	G_2 G_3	22	0.001

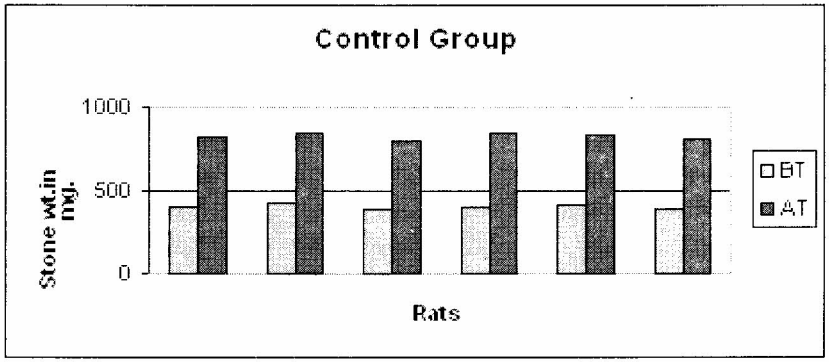
The mean Wt of Foreign Body found in Trial group I was 181.66 mg. and in Trial group II was 25.83 mg. The t value found in this experiment was 22, which suggests the highly significant activity of *Swadamshtradi Ghana Vati* with a p-value at <0.001 over *Swadamshtradi Kashaya*.

Conclusion

The results of the experimental study revealed that both the trial drugs are highly significant in case of urolithiasis. When the two trial drugs compared in between, it has been revealed that, the *Ghana Vati* i.e. trial drug II is more significant over *kashaya* with a t-value 22 and p-value at <0.001.

Moreover, the *Ghana Vati* also gives other benefits, like.

- More pharmaceutical elegance,
- Easy handling,
- Can be preserved for longer duration,
- Can be administered easily etc.



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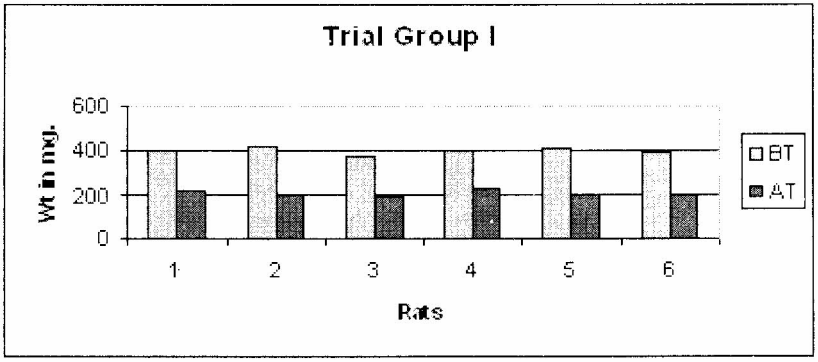

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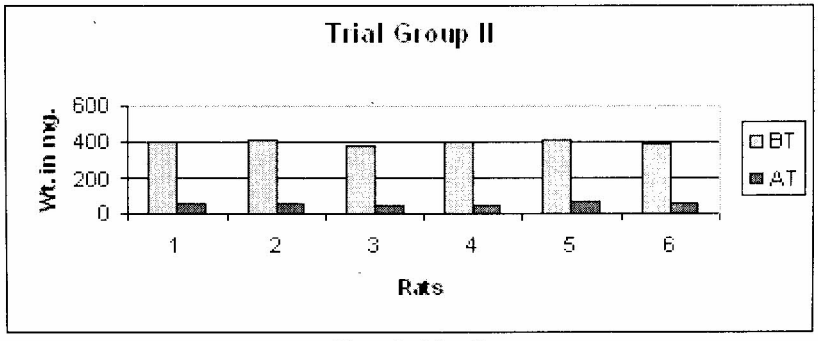

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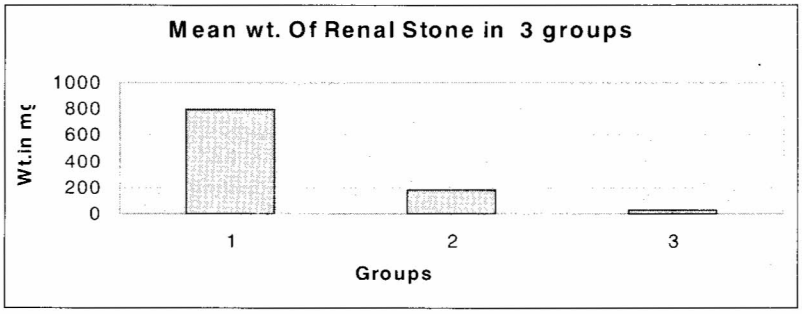

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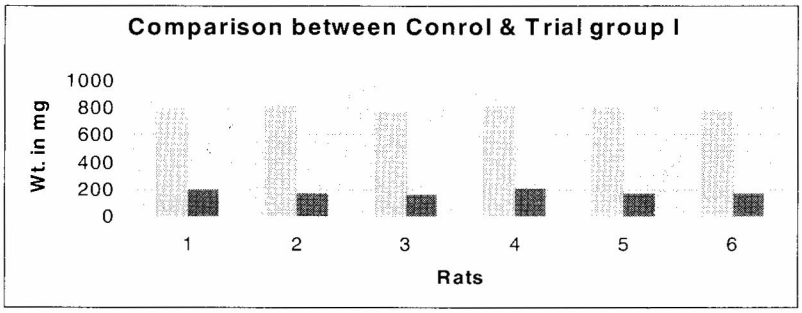

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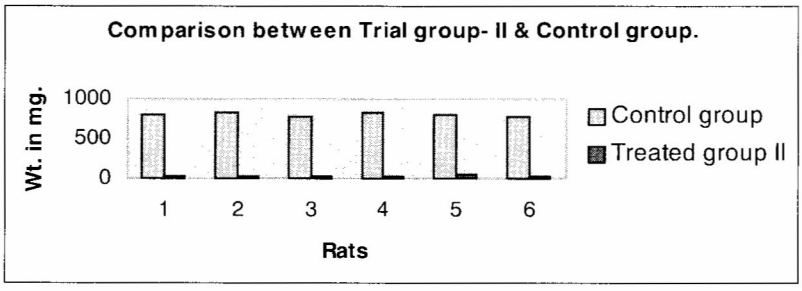

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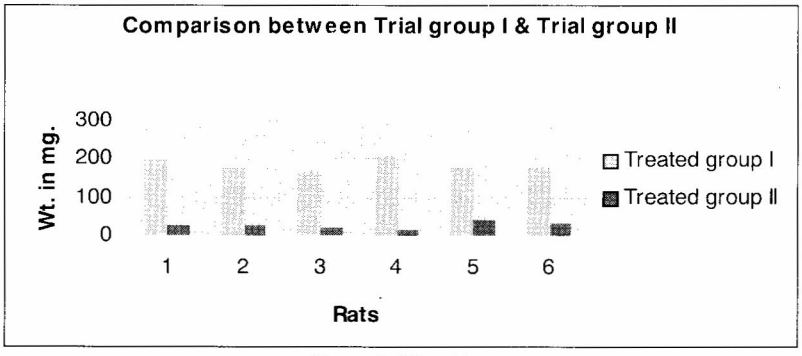

Graph No. 7

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सारांश

श्वदंष्ट्रादि क्वाथ एवं श्वदंष्ट्रादि घनवटी की अश्मरिभंजन कार्य एक प्रायोगिक अध्ययन

गालिब, बी एस. बेहेरा और अनुकूल चन्द्रकर

मूत्र विज्ञान में वृहत् शोध के पश्चात भी मूत्राश्मरता अभी भी रहस्यमय रोग बना हुआ है। आधुनिक उपकरण एवं जाँच आदि मूत्राश्मरता के उपयुक्त कारणों और तकनीकी को खोज पाने में असमर्थ हो रहे हैं। परन्तु वर्तमान के कुछ शोधों से विभिन्न तत्त्व ज्ञात हुये, जो कि इस अवस्था को परिलक्षित करने में निर्धारक हैं।

आधुनिक चिकित्सा पद्धति में इस रोग की चिकित्सा न केवल महंगी है बल्कि जरूरतमंद गरीबों की पहुंच से बाहर है। वास्तव में अश्मरी विलयन के लिये आधुनिक चिकित्सा पद्धति में कोई भी प्रभावकारी औषधि नहीं है। अभी भी आधुनिक चिकित्सा विज्ञानी अच्छे परिणामों के लिये अन्य चिकित्सा पद्धतियों पर निर्भर हैं।

इस रोग का वर्णन इतिहास के पन्नों से भी निकाला जा सकता है। आयुर्वेद में इस अवस्था का वर्णन 'अश्मरी' के रूप में है और इसे एक दुसाध्य रोग माना गया है। सौभाग्यवश आयुर्वेद में कई वनस्पतियों, वानस्पतिक खनिज तत्त्व हैं जो कि प्रभावकारी के साथ–साथ कम खर्च में उपलब्ध हैं।

चक्रदत्त में वर्णित (32/27) श्वदंष्ट्रादि क्वाथ अश्मरी चिकित्सा हेतु अध्ययन के लिये चुना गया है। मूत्राश्मरी रोग में औषधि मूल्य निर्धारण हेतु इसका चुनाव किया गया, एवं प्रायोगिक जंतुओं में इसका परिणाम उत्साहवर्धक रहा।