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A COMPARITIVE CLINICAL EVALUATION OF ASHMARIPATAN PROPERTY OF SHIGRU MOOL KWATHA IN THE ASHMARI W.S.R. TO UROLITHIASIS (MUTRASHMARI)

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Abstract: Mutrashamri is burning problem in recent era. After lockdown also there is increased cases of mutrashmari as sedentary life style is increased and continuous work without notifying natural urge. Study was carried out in the year 2012 to 2013 and yet is known to be effective. The study was carried out by giving Shigrumool Kwatha with comparison to Eladi Kwatha by applying all subjective and objective parameters of Mutrashmari. At the end it is proved that Shrigrumool Kwatha has Much more effective than Eladi kwatha and hence article is published

Key Words: Mutrashamari , Shigrumool kwatha , Eladi Kwatha , Veg , urolithiasis

INTRODUCTION

In Ayurveda, according to Acharya Wagbhata there are '13 VEGAS' which should not be hold. They are-

वेगान् न धारयेत वात विट् मूत्र क्षव तृट् क्षुधा

निद्रा कास श्रम श्वास जृम्भा अश्रु छर्दी रेतसाम् ॥ अ.सं. सू. ५/१

Vegas means natural urges or natural sensations like defecation, urination, anger, fear etc. These Vegas are actually meant for regulation of natural body clock, ultimately for good health. In today's time people are literally competing with time and in doing so they fail to perform even small daily cores viz: - micturition, defecation, taking food, oral hygiene etc. Not taking care of body even if it's excretory system, signals for expulsion of urine and stool. Yet suppressing natural urges is seen on large scale in daily practice and finally leading to illness.

As per Wagbhata —

रोगा: सर्वेपि जायन्ते वेगोदिरण धारणै: | अ.सं. सू. ५/२१

Mutrashmari i.e. Urolithiasis, a presence of calculi single or multiple in renal or urinary tract is a clinical entity which has been universally accepted as problematic condition regarding its treatment in all systems of medical science. The rational treatments in modern medicines are hydrotherapy, surgical removal or lithotripsy of calculi. There is no drug therapy known at present time which dissolves or fragment the calculi in the systems by changing lithogenic potential of particular person.

In Ayurveda, Mutrashmari has been described in details under the headings of 'Ashmari' Not only surgical but also number of drug are described which are effective against Mutrashmari like Kulatha, **Shigru,** Gokshur etc which help in dissolution of calculi thus, fascinating their expulsion. Shigru is one of them which is explained by **Sushruta** in **Varunadi gana** and by **Yogratnakara as ashmaripatak** drug in **Ashmari chikista**

AIMS

1. A comparative clinical evaluation of 'Shigru Mool Kwatha' and 'Eladi Kwatha' in Mutrashmari with special reference to Renal - Urinary and Bladder Calculus.

2. To propose the probable mechanism of action of Shigru Mool Kwatha in Mutrashmari.

OBJECTIVES

1. To evaluate clinical efficacy of 'Shigru Mool Kwatha' in 'Mutrashmari'

2. To propose an alternative, cost effective, long lasting and easily available herbal preparation in management of Mutrashmari

3. To review the literature of 'SHIGRU' - MORINGA OLEIFERA

4. To review the available ancient and modern literature of Mutrashmar

MATERIAL AND METHODS

CONSENT:

A well-informed written consent of all subjects had taken before starting treatment.

SITE OF STUDY:

Study conducted at -The Department of Shalya Tantra OPD and IPD ,R. A. Podar Medical College (Ayu.) & M. A. Podar Hospital Worli, Mumbai -18.

TYPE OF STUDY: Comparative Clinical Study

SAMPLE SIZE: Total 60 subjects

Group A: 30 & **Group B:** 30

METHOD OF PREPARATION OF DRUG:

Group - A: 'Shigru Mool Kwatha' had been prepared by standard method of 'KWATHA KALPANA' as described in 'SHARANGDHAR SAMHITA'.

Group - B:' Eladi Kwatha' had been prepared by standard method of 'KWATHA KALPANA' as described in 'SHARANGDHAR SAMHITA'.

ROUTE OF ADMINISTRATION: Orally

STUDY DESIGN:

GROUP - A:
1. Matra: 40 ml **Shigru Mool Kwatha** - twice a day
2. Anupana: Koshnajal
3. Sewan Kal: Pragbhakta

GROUP - B:
1. Matra: 40 ml of **Eladi Kwatha** - twice a day
2. Anupana: Koshrlaja
3. Sewan Kal: Pragbhakta

STUDY DURATION PER SUBJECT: Study conducted for 12 weeks i.e. 3 months.

FOLLOW UP: During 12 week of study duration follow up
1. Once in a week for 1 month. Then
2. Once in a fortnight up to 2 months.

Patients were monitored periodically and investigated as and when required.

CLINICAL EXAMINATION: A good clinical examination will be done to diagnose and assess the condition of subject

CRITERIA OF SELECTION OF PATIENT:

A. INCLUSIVE CRITERIA:

1. Both sexes of age 18 year to 60 years.
2. Subject diagnosed with Mutrashmari.
3. Single or multiple calculi of Kidney - Ureter - Bladder of less than 8 mm.
4. Subjects providing a signed and dated written informed consent prior to study, after the nature of study fully explained and question and doubts satisfactorily answered.
5. Subjects with or without history of recurrent calculi.

B. EXCLUSIVE CRITERIA.

1. Calculus size more than 8 mm.
2 Any congenital anomalies of Kidney, Bladder, Ureter.
3. Calculus associated with other systemic disease like

Tuberculosis	Hypertension
(Pulmonary/ Extra pulmonary)	AIDS
Carcinoma	BPH
Liver Cirrhosis	Acute Renal Failure
Hepatitis B	Stricture Urethra
Hydronephrosis	

4. Subjects with history of any allergy.
5. Pregnancy and Nursing i.e. lactating mother.
6. Any subject requiring emergency medical and surgical intervention.
7. Subjects currently undergoing any allopathic or alternate treatment for `Mutrashmari'
8. Participation in any other clinical trial within past 30 days.
9. Any other medical condition that in the 'OPINION OF GUIDE' may cause the subject to be unsuitable for completion of study or place the subject at potential risk from being in study.

STUDY ASSESSMENT

A. BASELINE ASSESSMENT: General Systemic Examination

TPR	RS	PALLOR
BP	CVS	CYANOSIS
HEIGHT	CNS	CLUBBING
WEIGHT		GENERALISED OEDEMA

B. LABORATORY ASSESSMENTS:

1. HEMATOLOGY: CBC [Hb, RBC, WBC, DLC]

2. CLINICAL CHEMISTRY:

ESR	BT/ CT
LFT	RFT

BSL (Fasting/Postprandial)

3. URINE EXAMINATION:

Routine

Microscopic

Urine pregnancy test only at screening visit

4. SEROLOGICAL TESTS:

HBsAg

HIV I & II

C. RADIOLOGICAL ASSESSMENTS: (Only at Screening Visit & End of Study Visit)

Plain X - ray KUB

USG - Abdomen and Pelvis IVP if necessary

PARAMETERS FOR CLINICAL ASSESSMENT WITH GRADATION

SUBJECTIVE PARAMETERS

1. BURNING MICTURATION:

> No burning0

> Tolerable burning 1

> Intolerable burning2

2. HEMATURIA:

> 0 — 5 Red cells/ hpf 0

> 5 — 20 Red cells/ hpf 1

> More than 21 Red cells/ hpf2

3. DRIBLING MICTURATION:

> Not at all 0

> Half the time 1

> Almost always 2

4. PAIN:

Visual Analogue Scale: The following scale was used to help out Assessing the severity of pain. Subject will be asked to locate a finger at any of the numerical over the scale and the severity of pain was assessed, according to that for which the numerical are labeled.

0	1	2	3	4	5	6	7	8	9	10
No Pain	Mild Pain		Discomforting		Distressing		Horrible		Excruciating	
NIL	MILD		MODERATE						SEVERE	

OBJECTIVE PARAMETERS

1. Fragmentation of calculi (Change in size of calculi.)

2. Change in position of calculi.

ASSESSMENT OF EFFECT OF THERAPY

A. **CURE:** Total score 0 with absence of calculi.

B. MODERATELY IMPROVED: Total score 1-5 and/or fragmentation and/or Change in position of calculi.

C.RELIEVED: Total score 6-11 and/ or no fragmentation and/ or no change in position of calculi.

D.UNCHANGED: Total score 12-16 and/or no change.

ADVERSE EVENTS:

Adverse Event had conducted and evaluated for relation to study drug seriousness and expectedness. They were reported to authorities and followed up according to requirements. Subjects were withdrawn if necessary on discretion of the guide and shifted for further management.

DROP OUT:

Reason for drop out will be recorded in CRF (Subject who have not completed the therapy are considered to be drop out cases)

SUBJECT WITHDRAWAL:

Subjects had right to withdrawn from study at any time and for any reason without prejudice to his/ her future medical care by physician at the institution. At the time of withdrawal the subject was evaluated for safety whenever possible.

OBSERVATION AND RESULT

The data that has generated during the clinical study was grouped under two headings:

1) Demographic Analysis
2) Subjective analysis

Demographic Analysis:

Total 60 patients were registered for this study. The demographic Analysis of these patients is being presented there after.

1) AGE WISE Distribution of 60 patient of Mutrashmari

Patient included in the trial range from 18 to 60 years of the age
8 patients (13.33%) were from the age group 18 to 20 yrs.

33 patients (55%) were from the age group 21 to 30 yrs.

13(21.67%) were from the age group 31 to 40 yrs.

3 patients (5%) were from age group above 41 - 50 yrs.

3 patients (5%) were from age group 51 to 60 yrs.

From above observation it is clear that Mutrashmari is mainly found in age group 21 - 40 years

2) **According to Sex wise distribution** out of 60 patients Incidences of Mutrashmari was observed in 41 males (68.33 %) and 19 females (31.67 °/0). In both the study groups majority of patients were male.

3)**Diet wise distribution** showed that out of 60 patients, 42 (70%) were having mixed diet and 18 (30%) were having only vegetarian diet. There is more incidences of Mutrashmari in mixed diet patient.

4) Out of 60 patients **HISTORY OF UROLITHIASIS** was seen in 17patients (28.33 %) and 43 patients (71.67%) were fresh cases of urolihiasis. i.e maximum patients in study groups were fresh cases of urolithiasis.

5) **Occupational History**: Out of 60 patients
23 patients (38.33) were workers,
10 patients (16.67) were in Service section
8 patients (13.33) were Driver
8 patients (13.33) were Student
9 patients (15) were House wives
2 patients (3.33) were retired persons

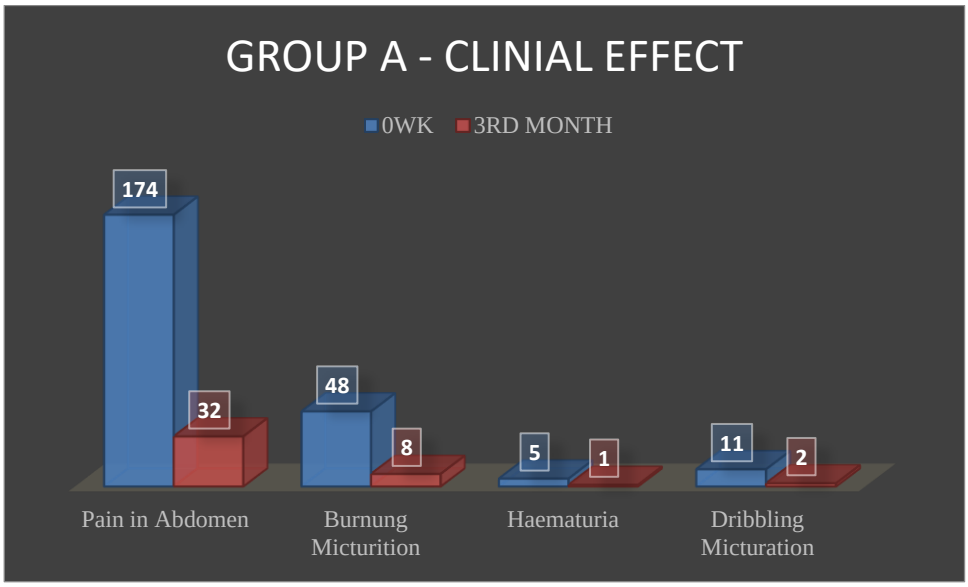
6) **Economic Status :** It is clear from study that maximum no i.e. 18 patients (60%) were from economical class III , 8 patients (26.67 %) were class from class II 3 patients (10 %) were of class IV and 1 patient (3.33 %) was class I.

7) **Marital Status** : 39 patients (65%) were married 21patients (35 %) were unmarried

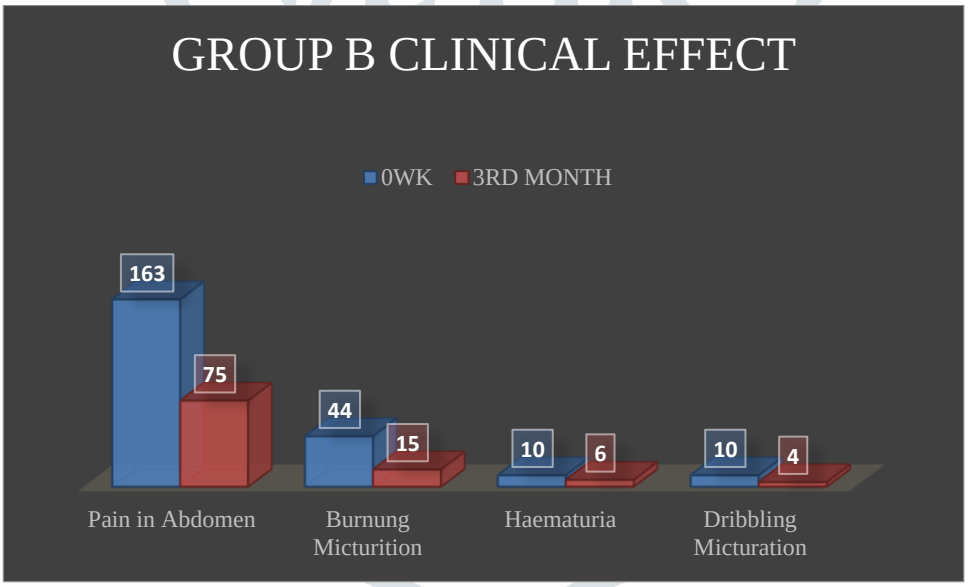
8) Addictions : In 56.67 % patient has no drug addiction found, 15 % patients had tobacco Addiction, 16.66 % patient had smoking habit and 11.66 % patients had alcohol and tobacco addiction. It indicates addiction doesn't had relation with calculi formation

9) Table Showing effects on clinical parameters after follow up of 3rd Month end in Group A

SR.NO	SYMPPTOMS	0WK	3RD MONTH	DIFFERENCE	% OF RELIEF
1	Pain in Abdomen	174	32	142	81.60%
2	Burnung Micturition	48	8	40	83.33%
3	Haematuria	5	1	4	80%
4	Dribbling Micturition	11	2	9	81.81%



10) Table Showing effects on clinical parameters after follow up of 3rd Month end in Group B



This study showed that, in trial group 15 patients were having calyceal calculus and 15 patients were having ureteric calculus. Out of 15 patients of calyceal calculus, 8 patients shows expulsion of calculus after treatment. Out of 15 patients of ureteric calculus , 11 patients show expulsion of calculus i.e. Shigrumul kwatha is useful in ureteric calculus for expulsion. But not single patient shows that calculi moved from previous site to next site.

This study showed that in control group 19 patients were having calyceal calculus and 11 patients were having ureteric calculus. Out of 19 patients of calyceal calculus 8 patients shows

expulsion of calculus after treatment and 1patient shows movement of calculus from Right calyx to Right ureter. Out of 11 patients of ureteric calculus , 3 patients show expulsion of calculus.

There is urine infection in 11 patient before treatment in Group A which reduced to 4 After treatment as compare to Group B had 10 Patients with urine infection before treatment which reduced to 3 after treatment. In case of epithelial cells Group A had 3 patients with epithelial cells before treatment and 1 patient after treatment compared with Group B had 4 patients before treatment and 2 patients shows presence of epithelial cells.

Group A drug decreased casts from urine in 2 patients as 10 patients has presence of cast before treatment which reduced to 8 after treatment and Group B didn't had any effect over cast.

Above result suggest Group A drug has good result on urine at microscopic level than Group B.

DISCUSSION

Discussion of present study is divided into following component.

Discussion on demographic analysis

Discussion on clinical efficacy of therapy

General discussion . Difficulties and limitations of study

The demographic analysis of 60 patients of Mutrashmari, included in this trial suggested the following:

AGE:

It is seen that 55% of patients belonged to age group 21-30 yrs followed by 21.67 % of age group 31-40 yrs. This shows that the incidence Mutrashman is more in middle age patients. It could be due to they do labourious work hence vata - prakopa takes place. Also this excessive work causes excessive sweating thereby reducing urine output which in turn accelerates formation of calculus.

SEX:

68.33 % of patients in the study were males and rest were females. This reveals that the incidence of Mutrashmari is more in males.

Religion:

No specific relation of prevalence of urolithiasis with religion.

Diet:

Diet plays important role in disease, in sample of 60 patient. Maximum patients were taking mixed diet and consuming more non vegetarian food which contains phoshrous and purine and predispose to phosphate calculi.

H/O urolithiasis:

28.33 % patients had H/O of urolithiasis and 71.67 % had freshly formed renal calculi.

Occupation:

38.33% of patients in this study were occupation of worker This shows that the incidence of Mutrashmari is more in worker. Because worker doing labourer work had more chances of calculi formation because of excessive sweating and holding of urine for more time due to multiple reasons.

Economical class : Patients in class III had 60 % occurance of calculi because of un-awareness of health and economical drawback.

Marital status:

The incidence of patient with marital status indicate that 65%

patients are prone to urolithiasis.

Addiction:

No specific relation of prevalence of urlolithiasis with addiction.

The clinical analysis of 60 patients of Mutrashmari, included in this trial suggested the following:

Pain in Abdomen:

In Group A the pain was reduced up to 81.60 % whereas in

Group B it was reduced up to 53.98 %. This was put to further statistical analysis. By Wilcoxon Signed Rank test, the results were highly significant in both the Groups A and B.

In Group A, $Z=4.622$, $p< 0.001$ and in Group B, $Z=4.703$, $p<0.001$ The results of Mann Whitney Test, applied to compare the both groups, was significant ($P>0.010$)

From Statistical analysis it shows that there is good pain relief in trial group compare to comparative group.

Burning micturition:

In Group A the burning micturition was reduced up to 83.33 % whereas in Group B it was reduced up to 65.90 %.

This was put to further statistical analysis.

By Wilcoxon Signed Rank test, the results were highly significant in both the Groups A and B. In Group A, $Z=4.372$, $p< 0.001$ and in Group B, $Z=3.823$, $p<0.001$

The results of Mann Whitney Test, applied to compare the both groups, was insignificant ($P>0.268$) From Statistical analysis it shows that there is good relief in

burning micturition in trial group compare to comparative group.

Haematuria:

In Group A haematuria was reduced up to 80 % whereas in Group B it was reduced up to 40%.

This was put to further statistical analysis.

By Wilcoxon Signed Rank test, the results were highly significant in both the Groups A and B. In Group A, Z=1.604, p< 0.001 and in Group B, Z=1.153, p<0.025

The results of Mann Whitney Test, applied to compare the

both groups, was insignificant (P>0.478)

From Statistical analysis it shows that there is good result in haematuria in trial group compare to comparative group.

Dribbling micturition:

In Group A the pain was reduced up to 81.81 % whereas in Group B it was reduced up to 60 %.

This was put to further statistical analysis. By Wilcoxon Signed Rank test, the results were highly significant in both the Groups A and B. In Group A, Z=2.201, p< 0.031 and in Group B, Z=1.572, p<0.013

The results of Mann Whitney Test, applied to compare the

both groups, was insignificant (P>0.80) From Statistical analysis it shows that there is good relief in

dribbling micturition in trial group compare to comparative group.

Urine Analysis:

Urine analysis shows pH of urine of group A before treatment and after treatment is acidic and group B shows urine pH before and after treatment is acidic.

Urine analysis shows cast absent in urine of group A and group B 19 patients before and after treatment and cast present in group A and group B in 11 patient.

So the effect of therapy of group A shows more significant changes than group B with no side effect.

From Statistical analysis it shows that the trail group drug

shows good result in all symptoms to reduce of urolithiasis.

TOTAL EFFECT OF THERAPY

TOTAL EFFECT	GROUP A	0%	GROUP B	0%
Cured	19	63%	10	33 %
Markely improved	4	13%	1	3%
Improved	4	13%	3	10%
Relived	3	10%	17	56%

As out of 30 pts of trial group 19 pts were cured, 4 pts were markedly improved,4 pts was improved and 3 patients were, while out of 30 pts of control group 10 pts were cured, 1 pt markedly improved 3 pts were improved and 17 patients were relieved. It indicates that Shigrumool kwatha has significant role Mutrashmari than Eladi kwatha with the help of. on

Chi-square test we concluded the result as p was <0.05, Hence Shigrumool kwatha was more effective than control group drug Eladi kwatha.

General Discussion:

- More number of patients were with calyceal calculus followed by ureteric calculus.
- Kapha and Vata play a major role in the formation of calculus from the beginning till the end. Ruksha, Laghu, Tikshna properties of Shigrumool reduce the chances of nidus formation as well as reduce the growth of the stone by inhibiting the binding property of Kapha - dosha. Because of Sara and Tikshna guna, they gradually erode vitiated Kapha and bring it downwards.
- Shigrumool have sympathetic action on urinary system and mootrala effect thereby increasing intra-luminal pressure. Because of this pressure, calculus is expelled quickly as a whole from urinary system.
- Shirgumool having properties like tikshnatva, ruksha and sara act over compact molecules of calculus, thereby making the bond in molecules weak and reduces size of stone. Decoction of Shigrumool kwatha
- Increase peristaltic movements of smooth muscles in urinary system and in turn help in expulsion of urinary calculus.
- Shigru mool kwatha reduces burning micturition, pain in abdomen associated with calculus by maintaining anti-inflammatory action.
- Koshna Jala used as anupan is the best kaphaghna by dipana pachana and ushna guna. It has basti shodhan property hence quite effective against ashmari.
- Ashmari is disease of mutravaha srotasa which is under Influence of Apana - vayu. So Shigrumool kwatha and Eladi. kwatha are given with Koshna Jala is given in Apana - kala i.e. before meal to enhance the action of drug.
- As the disease is Kapha - Vataj in nature, patients were asked to adopt and avoid the pathya and apathy affecting kapha and vata respectively explained in our classics.
- Also, according to modern calcium oxalate, purines, etc causes calcull patients were asked to avoid diet rich in such substances e.g. cauliflower, coffee, tea, strawberry, spinach, chikoo, chocolate, meat, sea food, chicken, etc. > Selected drug i.e. Shigrumool kwatha and Eladi kwatha with koshna jala is easily available and doesn't need special preparations.
- As the drug is given by oral route, there is no need of hospitalization. the drug can be given on OPD basis.
- Thus, action of Shirgumool ultimately results in painless expulsion of mutrashmari by increasing frequency of micturation.

Difficulties and limitations of the study -

- Size of stone expelled was not measured and analysed as patients were unable to collect them, inspite of instructions.
- During trial work 2 patients of group A had sever pain in abdomen so we had given them inj. Buscopan 1cc IM stat to relieve the pain and then patient kept on Shigrumool kwatha.
- Same complain of sever pain in abdomen present in 1 patient of comparative group B and had given Inj Buscopan 1cc IM stat. After relieving pain patient was kept on Eladi Kwatha

SUMMARY

Urolithiasis has plagued mankind for centuries. Mutrashmari was considered as one of the Mahagadas by Ayurvedic acharyas. No doubt that it is a significant worldwide problem accounting for a considerable degree of morbidity.

In current surgical practice we are facing many problems in treating mutrashmari effectively. All the treatment modalities in modern science are very costly and insufficient to reduce the prevalence of mutrashmari. So A COMPARITIVE CLINICAL EVALUATION OF 'SHIGRU MOOL KWATHA' IN THE MUTRASHMARI WITH SPECIAL REFERENCE TO UROLITHIASIS was selected as topic for dissertation.

Review of literature was taken to collect the information about Mutrashmari, its management and related Sharira rachana and kriya according to Ayurveda as well as modern science.

- Shirumool kwatha and Eladi kwatha were manufactured Patients were selected as per selection criteria from the hospital attached to our college and divided into two groups randomly.
- Trial group patients were given Shirumool kwatha in the dose of 40 ml twice a day along with koshnajala for 3 months.
- Control group patients were given Eladil kwatha in the dose of 40 ml twice a day along with koshnajala for 3 months.
- Same diet and behaviour regimen were instructed to all patients, so that all of them were almost under similar conditions.
- Any side effects or adverse effects were looked for.
- Conclusion were drawn on the basis of observation and results.

CONCLUSION

From the clinical trial we can reach up to following conclusions -

During trial work out of 60 patients 34 patient had Vrukkashmari, 21 patient had Gavinyashmari,. No one found having Bastyashmari and Mutrasparesekashmari.

- Colicky pain in abdomen subsided in 81.60 % cases at the end of 3rd month of treatment.
- Burning micturation was absent in 83.33% patients at end of the 3rd month end.
- Haematuria completely disappeared in all cases at the end of 2nd month end.
- Incidences of ureteric calculus was seen in 50% of patients and out of them 73 % patients showed expulsion of calculus after treatment.
- Action of drug is due to its rukshan, tikshantva, saratva and mutrala properties.

- Patients treated with Eladi kwatha also shows expulsion of Calculus 4 but in the trial group expulsion was highly significant. 10% patients got no relief after treatment with Shigrumool kwatha.

- In this study, it was found that the proposed duration treatment is 3 months, which was insufficient in some cases to expel the calculus. Hence it may require a longer time to get significant effect.

After treatment all patients had advised to follow some orders which are helpful for prevention of stone formation again. The orders are -

1) Drink plenty of water 2-3 lit/ day and more in hot seasons like summer, October heat.
2) Try to avoid strenous work in heat which lead to sweating.
3) Avoid non-vegetarian diet as much as possible.
4) Don't eat vegetables spinach, cauliflower, French beans, etc which contains calcium oxalate, purines, phosphorus.
5) Don't overdrink coffee, tea, milk and chocolate. 6) Avoid fruits which contains oxalate e.g. Chikku, Strawberry and dry fruits Kashewnut.

During the study, there were no adverse effects or

complications and the treatment were well tolerated by all patients.

- There is major advantage of this formulation for patient as it allows the patient to continue his day to day activity and save valuable time and render quality of life.

From the study, it can be concluded that administration of Shigrumool kwatha is an effective modality for mutrashmari which overcomes the surgical intervention by easy and painless expulsion of mutrashmari.

BIBILOGRAPHY

1.Baghel M. S.- A book entitled as"Research in Ayurveda" edited by Jain G. K. Published by Mridu Ayurvedic Publication

2.Sushruta Samhita Edited by Ambikadutta Tripathi. Published by Chaukambha Sanskrit Sausthan.

3.Yog Ratnakar Edited by Vd. Datto Ballal Borekar. Published by Gajanan Book Depot.

4.Sharangdhar Samhita- Edited by Brahmanand Tripathi. Published by Chaukambha Sanskrit Sansthan.

5.A Concise Textbook of Surgery Edited by Dr. Somen Das

6.Bailey & Loves- Short Practice of Surgery- Edited by Charles V Mann, R. C. G. Russel and Norman S. Williams

7.Manipal - Manual of Surgery- Dr. Rajgopal Shenoy, Second Edition (2nd edition) Published by Dr. S. Das.

REFERANCES

१. क्वाथश्च शिग्रु मूलोत्थः कटु उष्णो अश्मरी पातनः क्षीरान्न भुग् | (यो.रत्ना.-उत्तरार्ध – अश्मरी चिकित्सा)

२. क्वाथश्च शिग्रु मूलोत्थः कटु उष्णो अश्मरी पातनः | (अ.हृ. चि. ११ – मूत्राघात चिकित्सा)

३. पानीयं षोडशगुणं क्षुण्णे द्रव्येपले क्षिपेत्

मृत्पात्रे क्काथायेत् ग्राह्यम् अष्टमांश अवशेषितम् |

तज्जलं पाययेद् धीमान् कोष्णं मृद्वाग्नि साधितम्

श्रुत: क्काथ: कषायाश्च निर्यूह: स निगद्यते || (शा.सं . मध्यम खंड द्वितीय अध्याय १,2)

४. गण - स्वेदोपग ,कृमिघ्ना ,शिरोविरेचन ,कटू स्कंध ,हरीतक वर्ग ,(च.)

वरुणादी, शिरोविरेचन (सु.)