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Research Article

AN OBSERVATIONAL CLINICAL STUDY ON THE EFFECT OF NARIKELA KUSUMA: YOGA IN MUTHRASHMARI VIS A VIS URINARY CALCULI

Gajanana Hegde*

Department of PG studies in Kaya Chikitsa, Government Ayurveda Medical College Mysore, India

*Correspondence

Dr. Gajanana Hegde
Professor and Head, Department of PG studies in
Kaya Chikitsa, Government Ayurveda Medical
College Mysore, India

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ABSTRACT

The disease Ashmari is one among the eight major diseases or Astamahagadas. Detail information regarding the various aspect of the disease is available in the texts of Ayurveda. This infers the prevalence of ashmari since the inception of medicine in India. Even in the current era also, urinary calculi is an important health problem. In India 5-7 million people are estimated to be suffering from the disease. So only the study was conducted to evaluate the efficacy of narikela kusuma yoga in the management of mutrashmari. An observational study was conducted on 20 patients who were sampled in to one group. All the patients were administered the formulation in the form of kalka consisting of 10 g of narikela kusuma and 500 mg of yava kshara, twice daily for 21 days two hours before the intake of food. A pre test and a post test observation was made in terms of relief of symptoms such as bastipeeda, mutrakrichra etc, and in terms of reduction in the size of the stone. The reduction of size of the stones and relief of predominant symptoms like basti peeda, mutrakrichra were highly significant statistically with $P < 0.001$.

Keywords: Mutrashmari, urolithiasis, narikela kusuma yoga, yava kshara.

INTRODUCTION

Increased incidence of urinary calculi is noticed in mountain, dessert and tropical regions. Geography has an effect in terms of temperature and humidity, which also seems to influence the incidence of urinary calculi in human being¹. Peak age is 3rd to 5th decade. Majority of patients report regarding onset of disease is in second decade of life. Male to female ratio 3:1, increased citrate concentration in female may protect them from calcium stones. Incidence of urolithiasis is almost equal in children of both sexes. This may be because of decreased testosterone level in the children¹. Ashmari or urolithiasis is the formation of urinary calculi at any level of the urinary tract. Clinically it is characterized by colicky pain as they pass down along the ureter and manifest by haematuria². The methods of management of urinary calculi are mainly surgical. Even though they are useful, they involve considerable amount of risk and are also expensive. The rate of recurrence after surgery is also as high as 50 %. In the light of above situation, it is highly relevant to search for an alternative treatment which is both effective and inexpensive. There are various measures described in Ayurveda for the management of ashmari. There are several medicinal preparations prescribed in the classics which are claimed to be effective and safe. One among such formulation is "narikela kusuma yoga" which is selected for present study. The ingredients are easily available and mode of administration is simple. Hence narikela kusuma yoga is taken for evaluation of its efficacy in mutrashmari.

Aims and Objective of the Study

To evaluate the efficacy of narikela kusuma yoga in the management of mutrashmari

MATERIALS AND METHODS

The materials taken for the study were:

- Panchakola churna³
- Triphala churna⁴
- Narikela kusuma⁵ (Flowers or blossoms of *Cocos nucifera*)
- Yava kshara⁶

Pancha kola churna and triphala churna were obtained from the stocks of Government Ayurvedic Medical College and Hospital, Mysore, India supplied by Government Central pharmacy, Bangalore, India. The fresh and tender blossoms of narikela were taken for the study. Yavakshara was purchased from m/s Chaitanya Pharmaceuticals, Vijayanagara colony, Bellary, India for the purpose of the study.

Ethical clearance number: EC-1998 march / KC-4

Sampling

20 cases of mutrashmari were selected incidentally from the out patient department and in patient department of Government Ayurvedic Medical College and Hospital, Mysore, India and sampled in a single group. The patients were registered for the present study with the help of Performa prepared for the study.

Diagnostic Criteria

The diagnosis was made based on clinical symptoms and Ultrasonography of kidneys ureters and bladder.

Clinical Diagnosis

The following symptoms⁷ were considered for the clinical diagnosis Bastipeeda Mutra kricchra Sarakta mutra, Mutra dhara sangha Visheerna dhara Mutra, vikirana, Avila mutra, Asanna deshe shoola, Jwara, Hrillasa, Chardi, Sheetata, Mushka peeda, Shepha peeda

Radiological Diagnosis

Confirmative diagnosis was made on the basis of the ultrasound scanning of abdomen with special reference to kidneys, ureters and bladder.

Inclusion Criteria

The selection of the patient for the present study was done with following criteria

- Patients of either sex, between the age group of 16-60 years with a diagnosis of mutrashmari
- Freshly detected and untreated cases of mutrashmari
- Established and treated cases of mutrashmari, in whom the treatment was discontinued and a flush out period of at least one week was allowed.
- Patients with a primary diagnosis of mutrashmari and with a co morbidity of polycystic kidney, mild to moderate hydro nephrosis were included in the study.
- Patients of mutrashmari were selected for the study irrespective of their occupation and chronicity.

Exclusion Criteria

Following were the criteria to exclude the patients from the study:

- Patients with calculus associated with other systemic disorders such as renal failure, tumors, massive hydro nephrosis, diabetes's mellitus, progressive renal damage, cushing syndrome, sarcoidosis, vit D intoxication.
- Patient with complaint of persistent renal colic.
- Patients presenting in a stage of retention of urine.
- Patients having upadravas such as karshya, pandu, hrith pida.
- Patients having asadhya laxanas like prashuna nabhi and prashuna vrishana.

Intervention

Initially 5 g of panchakola churna was given thrice a day for 2-3 days to obtain ama pachana. After observing nirama laxanas, 6 g of triphala churna was given for one day, at bed time, with a cup of lukewarm water for the purpose of anulomana. After anulomana the patients were administered medical preparation in the form of kalka consisting of 10 g of narikela kusuma and 500 mg of yava kshara. The above preparation was administered twice a day once in the morning and once in the night, two hours before the intake of food. The treatment was given for 21 days. The patients were advised to drink plenty of water throughout the day. They were also advised to consume kulattha yusha regularly during the course of treatment. It was advised to avoid the following food articles and habits; sitaphala, kharjura, ragi balls, milk and milk products, tomato, cabbage, cauliflower, palak, tea, coffee, liquors and non vegetarian food.

Assessment Criteria

Two assessments were made. One before the commencement of the treatment and the other after the completion of the treatment i.e., on 21st day, following two criteria were applied to measure the degree of clinical improvement

- Percentage of reduction in the size of the stone after treatment.
- Percentage of relief in symptoms (14 symptoms as mentioned in diagnostic criteria) after treatment.

Each symptom was graded in a five points scale as follows
0 as none, 1 as mild, 2 as moderate, 3 as moderate to severe, 4 as severe

The total scores of pre test and post test assessments were compared and the reduction was calculated. An average of criteria 1 and criteria 2 was taken and the improvement was assessed as below.

- 100 % reduction was considered as cure
- Above 50 % of reduction was considered as marked improvement
- 30-50 % of reduction was considered as improvement
- 10-30 % of reduction was considered as insignificant improvement
- Below 10 % of reduction was considered as no improvement

OBSERVATION AND RESULTS

Table 1: Age group incidence in patients of mutrashmari

S. No	Age Group	No of patients	Percentage
1.	21-30	5	25
2.	31-40	8	40
3.	41-50	6	30
4.	51-60	1	5

It was observed that maximum number of patients (95 %) were from the age group of third to fifth decade. Only one patient (5 %) belonged to sixth decade of age. The incidence of the disease was 19 (95 %) in males and only one (5 %) in females. The incidence of mutrashmari was seen in majority of patients who belonged to sadharana desha (85 %). Two patients belonged to jangala desha (10 %) and one belonged to anupa desha. The established data indicates that the prevalence of urinary calculi is high in mountains, deserts and tropical areas. It was observed that 75 % of the patients had the habit of excess consumption of tea and coffee. 45 % of patients had the habit of consumption of alcohol and 5 % had the habit of smoking. It was observed that maximum number of patients was non vegetarians (80 %) and only 4 were vegetarians (20 %). It was observed that ten patients (50 %) were drinking water below the normal requirement i.e., below 1.5 liters / 24 hours. Rests of the patients (50 %) were drinking water in quantity of more than 1.5 liters. It was observed that 11 patients (55 %) used to drink water from the source of bore-well, 5 patients (25 %) from the sources of river and 4 (20 %) from both the sources the reason for these result could be presence of higher level of flurides in bore well water than the other sources. It was observed that all 20 patients used to consume calcium rich food such as milk products, cabbage and tomato and ragi balls. 16 patients (80 %) used to consume animal proteins rich in uric acid and oxalates. 15 patients (75 %) used to drink water from the source of bore well, which is said to be rich in fluride, where

as 10 patients (50 %) used to drink less quantity of water. It was also observed that 3 patients (50 %) had the history of heredity and one had repeated urinary tract infections, in the study it was noticed that the factors such as snigdha bhajana, animal protein and viharas like excessive travelling aggravate the disorder. Previous management in patients of ashmari shows 5 patients (25 %) had taken palliative measures. 6 patients (30 %) had undergone flush out therapy. 4 patients (20 %) had undergone surgical removal of stone, where as 5 had approached this hospital without undergoing any treatment previously. It was observed that 9 patients were said to be repeatedly suffering from ashmari. 11 have suffered from the disease for the first time; the cause of recurrence can be attributed to the improper dietary habits and other etiological factors. The most dominant clinical

symptom observed in the patients was basti peeda (pain abdomen). It was present in all 20 patients (100 %). Mutrakrichra was the next predominant symptom which was present in 16 patients (80 %). Sarakta mutra was present in 3 patients (15 %), where as 6 had (30 %) the symptom avila mutrata. Mutradhara sanga was present in 2 patients (10 %). The symptom mutravikirana and visheernadhara were found in 4 patients (20 %) each. Mushka peeda was present in 5 patients (25 %), where as 6 had the symptom shephasam peeda (30 %). Hrilasa was present in 6 % (30 %) and 2 had (10 %) asanna desha shoola. Chardi and sheetata (chills) were present in 2 patients (10 %) each, there were no patients with the complaint of fever in this study, it can be speculated that jwara is seen as a laxana in urinary calculi, when there is an associated infection.

Table 2: Different locations of stones in patients of urinary calculi

S. No	Before treatment		After treatment		
	Location	No of stones	percentage	No of stones	Percentage
	General location				
1.	Rt. Kidney	23	52.27	17	38.63
2.	Lt. Kidney	14	31.81	12	27.27
3.	Rt. Ureter	4	9.09	1	2.27
4.	Lt. Ureter	3	6.81	1	2.27
	Specific locations				
5.	Middle calyces	14	31.81	10	22.72
6.	Lower calyces	11	25.00	10	22.72
7.	Upper calyces	8	18.18	6	13.63
8.	Pelvis	3	6.81	2	4.54
9.	Corticomedullary Junction	1	2.27	0	0
10.	upper ureters	1	2.27	0	0
11.	middle ureters	1	2.27	0	0
12.	lower ureters	5	11.36	2	4.54

Table 3: Number of stones according to size before and after treatment

S. No	Before treatment		After treatment		
	Size of stones in mm	No of stones	Percentage	No of stones	Percentage
1.	Below 4 mm	2	4.54	1	2.27
2.	4 to 6 mm	21	47.72	14	31.81
3.	Above 6 mm	21	47.72	16	36.36

It was observed that vast majority of patients (70 %) had multiple calculi, 6 patients (30 %) had single calculus

Table 4: Effect of narikelakusuma yoga on urinary calculi

S. No.	Effect of therapy	No of stones	Percentage
1.	Expulsion	13	29.54
2.	Change in size	12	27.27
3.	Change in location	5	11.36
4.	No change in size	19	43.18

Table 5: Statistical analysis of reduction in the size of the stones after therapy

Title	Mean (X)	S.D	S.E	t	P	Remarks
Reduction in size of stones	2.8181	3.9443	0.5946	4.7393	<00	Highly significant

The reduction in size of stones at the end of 21 days in 20 patients was highly significant with $P < 0.001$. Data was collected before and after the treatment

Table 6: Statistical analysis of the effect of therapy on individual symptoms of mutrashmari

Symptoms	Mean (X)	S.D	S.E	t	P	Remarks
Bastipeeda	2.6	0.7531	0.1683	15.4486	< 0.001	H.S
Mutrakrichra	1.75	0.9665	0.2161	8.0981	< 0.001	H.S
Saraktamutra	0.35	0.6708	0.1499	2.3348	< 0.025	S
Mutratharasanga	0.05	0.2236	0.0499	1.0020	< 0.1	N.S
Visheernadhara	0.35	0.8223	0.1838	1.9042	< 0.05	S.S
Mutravikeerana	0.15	0.4893	0.1094	1.3711	< 0.1	N.S
Avilamutrata	0.4	0.6805	0.1521	2.6298	< 0.01	S
Mushkapeeda	0.25	0.6386	0.1427	1.7519	< 0.05	S.S
Shephasampeeda	0.45	0.8255	0.1845	2.4390	< 0.025	S.S
Asannadeshapeeda	0.05	0.2185	0.0488	1.2459	< 0.1	N.S
Hrillasa	0.25	0.5128	0.1146	2.1815	< 0.025	S.S
Chills and rigors	0.05	0.2185	0.488	1.0248	< 0.1	N.S

Showing the overall effect of therapy in 20 patients of mutrashmari

It was observed that out of 20 patients, 4 patients (20 %) were completely cured, marked improvement was established in 12 patients (60 %) and an improvement was noticed in 4 patients (20 %). On the contrary none was observed to be in the group such as “insignificant improvement” and “no improvement”.

DISCUSSION

Out of 25 patients registered, 5 patients discontinued the treatment. Among the drop outs, one patient discontinued the therapy due to the acute exacerbation of pain. Other two patients had difficulty in compliance to attend the hospital regularly. The cause of discontinuity in the remaining two patients could not be known. It is considered that the peak age of the occurrence is from third to fifth decade of life. In the present study also it was observed that a maximum number of patients belonged to third to fifth decade of life. It was observed that non vegetarians are more prone to develop urinary calculi which seem to be rational. Among the cause for calculus the intake of animal protein which is rich in calcium oxalates, phosphates and purine is one. As in non vegetarians there is a chance of more accumulation of the above components in the body, they have a high risk of developing the disease. Regarding the habit it was observed that almost all the patients had one or the other habit. The relation between habits and the formation of stone can be speculated in the following manner. Alcohol is rich in purine which may cause precipitation of uric acid level in the urine. In the same way increased caffeine in the people who are habituated to the intake of higher level of caffeine are prone to develop hyper calcimia. The direct relation between smoking and calculi could not be elicited. It was also observed that calculi has tendency of recurrence even after its clearance by various surgical and non surgical measures. Tendency of recurrence is also highlighted in the available

literature. The cause of recurrence can be attributed to the improper dietary habits and other etiological factors. It was also observed that the quality of water has some influence on the incidence of urinary calculi. The people who used to drink bore well water have a higher chance (55 %) of developing the disease. The reason could be the presence of higher level of fluoride in bore well water than the other sources. Among the etiological factors described to be of significance for the formation of urinary calculi, the intake of calcium rich food is highlighted. In this study also all the patients reported the intake of food articles such as tomato, cabbage, milk and milk products which are highly rich in calcium. Apart from calcium intake, excess intake of animal proteins, high fluoride consumption through water and less water intake were the most common causes reported which can be related to urolithiasis.

Urinary calculus is disease which gives rise to a large number of symptoms most of which are pain predominant. In this study all patients presented pain as predominant symptom. The pain was expressed in various manner and locations, basti peeda being the most common. Chardi, sheetata (chills) and mutra sanga were the other presenting symptoms in some of the patients. There were no patients with the complaints of fever in this study. Nevertheless, some patients reported a previous history of fever associated with pain in the pelvic region. It can be speculated that jwara is seen as a laxana in urinary calculi, when there is an associated infection. Among the clinical symptoms basti peeda and mutrakrichra were the most predominant ones as observed in the study. In most of the cases relief of basti peeda was observed at the end of first week, and the reduction of this symptom at the end of 21 days was highly significant statistically. When compare to basti peeda relief of mutra krichra the other predominant symptom was faster. According to statistical analysis relief of mutrakrichra was highly significant in the post test assessment. Statistical analysis also showed that the relief of

symptoms such as visheerna dhara, mushka peeda, shephasam peeda, hrillasa, sarakta mutra, and avila mutra was statistically significant, but the relief of the other symptoms such as mutra dhara sanga, mutra vikirana, asana deshe shoola and sheetata (chills) were statistically insignificant after the treatment. When the results were analyzed it was very clearly observed that the statistical significance was high in the relief of symptoms which had very high incidence. On the other hand the rare symptoms showed a relief which was statistically insignificant. As many patients reported the presence of multiple stones the numbers of stones were taken for calculation and statistical analysis, than the total number of patients. Among the 44 stones present, 13 stones had completely disappeared in the post test scanning report. Another 12 had reduced in their sizes, 5 stones were dislodged from their positions. The therapy had no effect on the remaining 19 stones. Regarding the variations in the size of the stone it was characteristic to note that more than 50 % of the stones responded to the treatment. This rate of reduction or elimination is very high when compared to the spontaneous passage of stone. Spontaneous passage is very likely when it is in ureter and is less than 4 mm (90 %). The possibility is only 50 % when the size is 4-6 mm and is located in the ureters. Spontaneous passage is very unlikely when size of the stone is over 6 mm and stone is located in the kidneys (less than 10 %). But in this study all the stones which responded to the therapy were either more than 6 mm in sizes or located in the kidney. The reason can be conveniently attributed to the therapy given. 11 stones of different size varying from 3-7 mm completely disappeared from the kidneys. The biggest stone that was eliminated in the clinical study was a 17 mm stone which was present in the ureter. Even though some of the stones which were above 17 mm showed some reduction in the size along with the clinical improvement of the patient, they were not totally eliminated. This persistence of the stones having bigger sizes indicates that the therapy is highly useful, when the size of the stone is small to moderate. This fact substantiates the statement of sushruta that ashmari is shastra sadhya in pravridha avastha. It was observed that 4 patients had complete elimination of stones. All the patients in whom the stones eliminated had also 100 % relief of symptoms. But contrary was not true. There were as many as 17 patients (85 %) who reported complete relief of symptoms, among them the calculi persisted in 13 patients, even though most of them reported a reduction in size of varying degrees. Only two patients who had complete relief of symptoms reported no change in the size of stone. It was not proportional to the reduction in the percentage of symptoms was not proportional to the reduction in the size of the stone.

Probable Action of the NKY

On the basis of pharmacological properties of narikela kusuma and yava kshara, the action of NKY on ashmari may be assessed in the following manner;

- As ashmari is kapha vata pradhana tridoshaja disease, the kshara due to its teekshna and ushnaguna can alleviate kapha and vata affecting prakriti vighata.
- The murtata of ashmari due to kapha dosha which is also the material cause is eroded by the ksharana guna of kshara, where as the katinatha of ashmari is reduced by its

sookshma and snigdha guna. Thus kshara helps in ashmari bhedana.

- The rationality of combining narikela kusuma with kshara may be to counteract the possible side effects of kshara with the properties of narikela kusuma antagonistic to kshara. The long term usage of kshara is said to produce shukranasha, ojonasha and dhatunasha. This is untoward effect is reduced by the vrishya and balya properties of narikela kusuma.
- Apart from counteracting the side effects of kshara, narikela kusuma may help in relieving pain by the virtue of its narcotic activity.
- Due to the diuretic property of kshara and basti shodhaka action of narikela kusuma, a flushing effect is anticipated. This helps in expulsion of ashmari if it is small in size.
- Strangury may be cured by the virtue of mutrala property of the formulation.

CONCLUSION

The results reveal that among 20 patients, 17 patients had highly significant improvement with respect to symptoms and the other 3 patients also had significant improvement. 57 % of the stones had reduction in size of varying degrees. In total all the 20 patients responded positively and the grade of response ranged from a total cure to an improvement. The degree of response reveals that it is higher than the spontaneous regression of size of stones and disappearance of symptoms. This can be attributed to the effect of narikela kusuma yoga. Therefore it can be stated that NKY has a significant role to play in the conservative management of mutrashmari vis a vis urinary calculi. It can be concluded that NKY helps to reduce the symptoms as well as to reduce the size of the stone and ultimately in flushing it out. It can also be concluded that the vaiparitya parinama of paneeya kshara will be very well counteracted by the virtue of opposite gunas present in NKY. The formulation becomes safer, convenient and efficient by the addition of NKY. It can be said that the yoga helps in the maintenance of proper acid base balance in the urinary system, imbalance of which is the main cause for the calculus formation. Ultimately, kalashodana with the legitimate usage of NKY will prevent as well as cure the ashmari in the urinary system. Indeed the tree itself is called as the “kalpavruksha”

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