DOI: 10.7860/JCDR/2022/57763.16875

Research Protocol

Surgery Section

Comparative Study of Efficacy of *Kutaja* Beeja Churna and Ayurvedic Herbal Compound in the Management of Mutrashmari (Urolithiasis)- A Research Protocol

AKSHAY KUMAR[1], DEVYANI DASAR[2]

ABSTRACT

Introduction: *Acharya* Sushruta, the father of surgery has included *Ashmari* in *Astamahagada* due to its fatal nature. "*Ashman*" the Sanskrit word, literally means "structure resembling stone". While the word 'Ari' means 'enemy,' so it refers to a sickness in which stones grow and inflict intense pain, as if caused by an adversary. *Mutrashmari* can be associated with Urolithiasis which is the third most common affliction of the urinary tract. *Acharya* Sushruta has described medicinal treatment in the initial stage of the disease and advised that surgery to be done only on failure of conservative treatment and when death becomes inevitable if not operated. In *Yogaratnakar, Ashmari chikitsa, Kutaja* is described to be more effective in the treatment of *Mutrashmari*.

Need of study: In modern medicine, the treatment of urinary stones is non surgical as well as surgical interventions but both have some limitations and also stone formation reoccurs after removal. There is a need for safe, cost effective and simple method of management of urolithiasis which is curative as well as preventive.

Aim: Comparative assessment of efficacy of *Kutaja Beeja Churna* and Ayurvedic herbal compound in the management of *Mutrashmari* (Urolithiasis).

Materials and Methods: A randomised control trial (single blind parallel) with 1:1 ratio on 2 groups and will be conducted in Mahatma Gandhi Ayurved College Hospital and Research Centre, Salod (Hirapur), Wardha, India. Expected duration of the study is one and half year (February 2022 to August 2023). Approval from the Institutional Ethical Committee has been taken and for this trial the registration number is CTRI/2021/09/036297. For statistical analysis Wilcoxon signed-rank test, Mann Whitney U test, Student's t-test and the Statistical Package for the Social Sciences (SPSS) software will be used in the study. After doing drug analysis, a total of 60 patients fulfilling the inclusion criteria will be selected and distributed in two groups having 30 each. In group A, *Kutaja Beeja Churna* and in group B, Ayurvedic Herbal Compound will be given twice a day for 45 days. Assessment will be done on day 15, 30 and 45 and after the intervention; follow-up will be taken on days 60 and 90. Results will be drawn from the observations of subjective parameters like pain and dysuria and objective parameters like size of the stone, site of the stone and haematuria.

Keywords: *Ashtamahagad*, Calculus, *Holarrhena antidysentrica*, Urinary stones

INTRODUCTION

Ashmari refers to a sickness in which stones formation occurs and which causes intense pain, as if caused by an enemy. In our Ayurvedic classics and vedic literature lot of references about *Ashmari* are present. The earliest reference available is in *Atharvaveda* (1st *khanda*, 3rd *sukta*, 6-9 *shlokas*). Charaka has described it under a type of *Mutraghata* where as *Acharya* Sushruta, the father of surgery has included *Ashmari* in *Astamahagada* due to its fatal nature and described in detail about *Mutrashmari* in a separate chapter with its aetiology, classifications, symptomatology, pathology, complications and management [1-4]. *Acharya* Sushruta described aetiopathogenesis of *Ashmari* as the person one who does not follows *Shodhana* treatment and who is *Apathyakaari* (uses unwholesome items), *Shlesma Dosha* gets aggravated and saturates in the urine. This saturated urine (*Shleshma Yukta Mutra*) is the material (cementary substance) which causes urinary stone formation [3].

Ashmari is invariably *Tridoshajanya*, however, a classification of *Ashmari* is made based on the predominance of dosha. *Ashmari* is classified into four types- *Vataja, Pittaja, Sleshmaja* and *Shukraja Ashmari* [3]. *Acharya* Sushruta has described medicinal treatment in the early stage of the disease and advised that surgery to be done only on failure of conservative treatment and when death becomes inevitable if not operated. Surgery is indicated along with a note of caution regarding its complication and doubt of success [4].

Urolithiasis means stone in urinary system whether in kidneys, ureters, bladder or urethra. Urolithiasis is the most painful and common disease of the urinary system. After Urinary Tract Infection (UTI) and Benign Prostatic Hyperplasia (BPH), it is the third most common disease of the urinary tract [5]. About 15% of men and 5% of women develop renal calculi at some stage. If one has developed renal stones in the past, is likely to have a 70% chance of formation of new stones in the future [6]. In India, one out of thousand people needs hospitalisation due to renal stone disease [7]. Males are affected three times as frequently as females. The peak incidence of stones occurs between the ages of 20-50 years. The major aetiological factors are inadequate fluid intake, western diet, excessive sweating due to hot climate, high protein diet, meat, calcium rich diet and sedentary occupation predispose to stones compared with manual workers [8]. More common in whites than in black. It is rare in children [9].

In modern medicine, the treatment modalities of urinary stones depend upon size, position of calculi etc. Non surgical management includes watchful waiting and flush therapy, which is time consuming, medical expulsive therapy with calcium channel blockers or alpha-antagonists, Extracorporeal Shock Wave Lithotripsy (ESWL) and Dormia basket procedure. Medications like Tamsulosin causes higher rates of headache, dizziness, abnormal ejaculation and postural hypertension [10]. Surgical intervention includes advanced techniques like Ureteroscopy, Percutaneous Nephrolithotomy (PCNL),

Partial Nephrectomy, Nephrolithotomy, Pyelolithotomy, Nephrectomy, Nephrostomy, etc. All these are expensive and invasive therapies; hence needs hospitalisation which is exhausting to patients as well as relatives.

These therapies, however, are therapeutic for urolithiasis, but they cannot prevent the pathophysiology that leads to the production of stones. As a result, stone recurrence after removal has become a typical occurrence. Keeping in view of the limitations in the treatment modalities presently available, there is a need for safe, cost-effective and simple method of management of urolithiasis which is curative as well as preventive. In Ayurveda various *churna, ghruta*, *kshara, kashaya, ksheera* and *uttarabasti* are mentioned by *Acharyas* to treat different types of *Ashmari*. In Yogaratnakar and Bhavaprakash, *Kutaja* is mentioned in *Ashmari* chikitsa as an effective treatment for both *Sarkara* and *Ashmari* [11].

Holarrhena antidysenterica, which is commonly known as *Kutaja*, is found in subtropical and tropical regions of Africa and Asia. It is abundant in India, especially in the Himalayan region. It is categorised as a deciduous, laticiferous shrub or a small tree, which attains a height up to 13 m and a girth of 1.1 m with a clear bole of 3-7 m. Its seeds are 8 mm long or more, linear oblong and are known as Indrajava [12].

As multiple factors are involved in the pathogenesis of urolithias is and therefore management demands multiple targets, such as antioxidant, antispasmodic, anti-inflammatory activities. *Holarrhena antidysenterica* contains ergostenol, conessine, kurchicine, holarrhenine, tannin and resin and has been reported to possess antibacterial, antimutagenic, immunomodulatory, diuretic and antispasmodic properties. In-vitro and in-vivo study conducted by Khan A et al., also shows antiurolithic activity of *Holarrhena antidysenterica* [13].

The ayurvedic herbal compound that we are using as a standard drug is a readily available drug in market. As the compound is from a reputed drug manufacturing company therefore name of the drug has not been mentioned here to avoid any conflict of interest. However composition of each tablet along with concentration is mentioned here. Each tablet of this compound is of approx 500 mg having extracts of *Shilapuspa (Didymocarpus pedicellata)* 130 mg, *Pasanabheda (Saxifraga lingulata)* 98 mg, *Manjistha (Rubia cordifolia)* 32 mg, *Nagarmusta (Cyperus scariosus)* 32 mg, *Apamarga (Achyranthes aspera)* 32 mg, *Gojiha (Onosma bracteatum)* 32 mg, *Sahadevi (Vernonia cinerea)* 32 mg and powders of *Hajrul yahood bhasma* 32 mg, *Shilajeet* 26 mg processed in *Vanatulsi (Ocimum basilicum), Gokshura (Tribulus terrestris), Lajjalu (Mimosa pudica), Kulattha (Dolichos biflorus)*, *Balam (Pavonia odorata), Jaratoota (Equisetum arvense)* and *Shaka seed (Tectona grandis)*. Preservatives like Sodium methylparaben and Sodium propylparaben is added to it.

The Ayurvedic herbal compound has been frequently used in practice as a preferred ayurvedic remedy for urolithiasis. As it contains many herbo mineral drugs, it is very costly and can not be a drug of choice for all classes of society. So, there is a need for safe, cost-effective and simple method of management of urolithiasis which is curative as well as preventive. *Kutaja* is economically viable and its seeds have *tridoshaghana* effect. Hence, the study is planned to see efficacy of *Kutaja Beeja Churna* in management of *Mutrashmari*.

Objectives

- To study the efficacy of *Kutaja Beeja Churna* on subjective and objective parameters in the management of *Mutrashmari* (Urolithiasis).
- To study the efficacy of Ayurvedic herbal compound on subjective and objective parameters in the management of *Mutrashmari* (Urolithiasis).
- To compare the efficacy of *Kutaja Beeja Churna* and Ayurvedic herbal compound on subjective and objective parameters in the management of *Mutrashmari* (Urolithiasis)

Case definition: *Mutrashmari*- patients with classical features namely *Nabhi basti sevni mehaneshu anaytam asmina mehati vedana, mutra dhara sanga, sarudhirmutrata, mutravikiranam, sasiktam* (unilateral or bilateral pain in the renal angle, pain in lumbar region, radiating pain from loin to groin, pain in scrotum and inner aspect of thigh, dysuria, haematuria) and presence of calculi confirmed by Ultrasonogram (USG) of abdomen and pelvis will be selected for the study.

Research question: Whether *Kutaja Beeja Churna* is equally or more efficacious than Ayurvedic herbal compound in the management of *Mutrashmari* (Urolithiasis)?

Null Hypothesis (H0): *Kutaja Beeja Churna* is not efficacious as Ayurvedic herbal compound in the management of *Mutrashmari* (Urolithiasis).

Alternative Hypothesis

(H1): *Kutaja Beeja Churna* is more efficacious than Ayurvedic Herbal Compound in the management of *Mutrashmari* (Urolithiasis).

(H2): *Kutaja Beeja Churna* is equally efficacious as Ayurvedic Herbal Compound in the management of *Mutrashmari* (Urolithiasis).

MATERIALS AND METHODS

A randomised control trial (parallel design) with allocation ratio 1:1 in two groups. Sample size of 60 individuals, with 30 each in control and trial group was calculated by formula: n1=kn2, n2=(zα2/=zβ) 2×2 (1=1k/) (μE-μC-δ)2. The sampling technique will be random sampling by computerised table method. The study will be conducted in Mahatma Gandhi Ayurved College Hospital and Research Centre Wardha, Maharashtra, India. Expected duration of the study is one and half year (February 2022 to August 2023). Approval from the Institutional Ethical Committee (IEC) has been taken and the reference number is MGACHRC/IEC/January-2022/435. The trial is registered under CTRI and registration number is CTRI/2021/09/036297. Informed consent will be taken before starting the trial. Gantt chart for study protocol has been given in [Table/Fig-1].

Steps	Q1	Q2	Q3	Q4	Q5	Q6
Enrolment of patients						
Drug collection and preparation						
Data collection						
Writing thesis parts up to methods						
Data analysis						
Writing rest of thesis						
Submission						

[Table/Fig-1]: Gantt Chart (Quarterly based).

Inclusion criteria: Patients from age group of 20-50 years, irrespective of gender, occupation and economic status complaining of *Nabhi basti sevni mehaneshu anaytam asmina mehati vedana* (unilateral or bilateral pain in the renal angle, pain in lumbar region and radiating pain from loin to groin, pain in scrotum and inner aspect of thigh or pain in atleast any one or more of above said sites), with or without dysuria (*mutra dhara sanga*), with or without micro haematuria (*sarudhirmutrata*) and with solitary or multiple urinary calculi present anywhere in urinary tract measuring between 5-9 mm size confirmed by USG abdomen and pelvis.

Exclusion criteria: Patients suffering from chronic diseases such as diabetes mellitus, hypertension, tuberculosis, Human Immunodeficiency Virus (HIV) positive, hepatitis B positive, reported cases of malignancy, ulcerative colitis, Crohn's disease or have disorders like renal failure, massive hydronephrosis Cushing's syndrome, polycystic kidney, urethral stricture, meatal stenosis, bladder neck contracture. Also patients who are Coronavirus Disease-2019 (COVID-19) positive and pregnant women will be excluded.

Criteria for discontinuing or amending the interventions: The patient will be withdrawn from the study if any event, drug susceptibility characteristics or some other illness or condition occurs. The patient will be given free treatment till the condition subsides.

Drug Collection/Authentication and Details of Drug Preparation

The raw material will be collected from local market and the drugs will be identified and authenticated by Department of Dravayguna of MGACH and RC, Salod (Hirapur), Wardha, India. *Kutaja Beeja Churna* will be prepared in Dattatraya Rasa Shala of MGACH and RC under supervision of subject experts by following the guidelines of *Churna Kalpana* mentioned in Bhaisjya Kalpana [14].

Ayurvedic herbal compound that we are using is a readily available drug in medical stores. We are not making this compound. It is a fixed dose combination of several herbs which is already available in market.

Primary outcomes: Primary objective is to study the efficacy of *Kutaja Beeja Churna* on subjective and objective parameters in the management of Mutrashmari (Urolithiasis). Possible primary outcome is that *Kutaja Beeja Churna* will reduce pain, dysuria, haematuria and at the same time it will defragment the calculus and make it easier to pass through urinary tract.

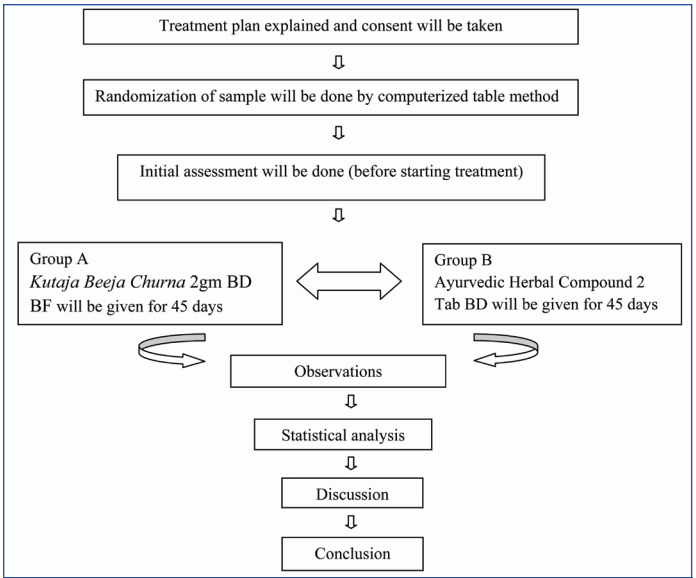
Secondary outcomes: Secondary objective is to compare the efficacy of *Kutaja Beeja Churna* and Ayurvedic herbal compound on subjective and objective parameters in the management of Mutrashmari (Urolithiasis). As *Kutaja* is easily available all over India, hence this study will contribute to cost-effective, safe, readily available, simple preparation and a good remedy for managing *Mutrashmari*.

Schedule of enrollment, interventions: Medications will be given daily two times a day for 45 days. Assessment will be done on day 15, 30, 45 and follow-up after intervention will be taken on day 60 and 90.

Implementation: Principal investigator will register subject and blinding will be ensured by the fact that participants will be deliberately kept ignorant of either the group to which they have been assigned. Two groups each with minimum of 30 patients will be included [Table/Fig-2,3].

Group	Sample size	Intervention	Dose and frequency	Anupana	Total duration
Group A	30	*Kutaja* Beeja Churna	2 gm BD BF	Dadhi (curd)	45 days
Group B	30	Ayurvedic herbal compound	2 Tab BD AF	Water	45 days

[Table/Fig-2]: Grouping and posology.
BD BF: Before food twice a day; BD AF: After food twice a day



[Table/Fig-3]: Study plan.

Assessment criteria

a. Subjective parameters:

1. Pain
2. Dysuria

Objective parameters:

1. Size of the stone (reduction in %) (by USG)
2. Site of the stone (location confirmed by USG)
3 Haematuria (no of Red Blood Cells (RBCs)/Hpf)

Gradation of Symptoms

Subjective parameters:

i. **Pain-** Pain of any degree and type, occurring at any sites of urinary system [15].

ii. **Dysuria-** Will be assessed by history of pain and radiation during micturition [15].

Objective parameters:

i) **Haematuria-** As observed in microscopic urine examination.

ii) **Descent of the calculi-** As seen in USG abdomen and pelvis.

iii) **Size of the calculi-** Change in size of calculi as seen in USG abdomen and pelvis.

Data management: Principal investigator will do coding of data.

Consent or assent: The written consent will be taken from the patient before starting the study. During the study the confidentiality of each patient will be maintained.

Dissemination policy: The data will be disseminated by paper publication. Authorship eligibility guidelines and any intended use of professional writers

Informed consent materials: With all the information model consent form and other related documentation will be given to participants.

STATISTICAL ANALYSIS

For statistical analysis, the software we are using is SPSS. The level of significance is at 95% and the tests for significance are Mann-Whitney U test, Wilcoxon signed-rank test, Student's t-test which will be applied on the observations of subjective parameters like pain and dysuria and objective parameters like size of the stone, site of the stone and haematuria.

DISCUSSION

Various types of Ashmari are *Vataja, Pittaja, Sleshmaja* and *Shukraja Ashmari*. In *Vataja Ashmari*, the clinical features are severe pain during micturition, clenches his teeth, squeezes the umbilical region, touches his scrotal region, touches his perineal regions, shouts loudly, feels burning sensation all over the body, passes vata, mootra and purisha with high difficulty. While the *Vataja Ashmari* will have *shyava varna, vishama* edges and resembles hard studded with thorns like *Kadamba Pushpa*. In *Pittaja Ashmari*, the clinical features *Dooshyana, chooshana, dahana, Pachana* and symptoms of *Ushnavata* will be seen. (Burning sensation and inflammatory changes in urinary tract). The *Pittajashmari* will have *Rakta Varna* or *Peetavarna* or *Krishnavarna* or *Madhuvarna* and resembles *ballataka asthi*. In *Sleshmaja Ashmari*, clinical features like *Daalyana*, *bhedana, nisthoda, basti gurutha* and *shitata* (Cutting, pricking, and incising pain in the bladder area, as well as heaviness and a cold sensation.) The *Kaphaja Ashmari* will have *shwetha* or *Madhukapushpa varna* and resembles *kukkutanda*. In *Shukraja Ashmari*, *Sukrashmari* (spermolith) develops in the adults giving rise to *mootrakrichra* (difficulty in micturition), pain in the *basti pradesha, vrushanayoho Shopha* (swelling in the testicular/scrotal region). It also has the unique property of being able to be crushed into powder under pressure. Children won't suffer from *Shukrashmari* as shukra is not secreted and hence there is no formation of *Ashmari* in relation to *Shukra* in *Basti* [3].

Various types of stones are found in urinary tract based on their composition. These are oxalate, phosphate, uric acid, cystine and some rare stones also. Oxalate stones typically form in the pelvis or calices and are prone to passing through the ureter. About 60-70% of overall calculi are made up of them. The altered blood is

deposited on the edge of stones and stone is rigid, granular like mulberries, with pointed edges. Phosphate stones form in the bladder and grow quickly in an alkaline urine environment. They have a smooth texture, a grayish white appearance, and a chalky texture. Phosphatic calculus, often known as staghorn calculus, is radio opaque. These stones are generally made up of triple phosphate and can frequently develop to an enormous size. Stones of uric acid form in the urinary bladder or the renal pelvis are firm, finely granulated, round to elliptical in shape, and yellowish to reddish brown in colour. Urate stones are usually radio-opaque due to the presence of calcium oxalate crystals. Cystine stones are a rare occurrence (0.4%) that results from a metabolic error. These are waxy, rigid, and have a smooth surface. They are pink or yellow in colour. Usually numerous and located in the renal pelvis and calices. These, too, have a proclivity to return after being surgically removed. Calcium carbonate, xanthine, silicate calculi, ammonium acid, matrix calculi, indigo, urate calculi, and bacteria, in rare cases, can produce microscopic soft concretions [9].

Urolithiasis is managed by various modern surgical and medical treatments. These therapies, however, are therapeutic for urolithiasis, but they cannot prevent the pathophysiology that leads to the production of stones. As a result, stone recurrence after removal has become a typical occurrence. In Ayurveda various *churna, ghruta, kshara, kashaya, ksheera* and *uttarabasti* are mentioned by *Acharyas* to treat different types of *Ashmari*. In Yogaratnakar and Bhavaprakash, *Kutaja* is mentioned in *Ashmari Chikitsa* as an effective treatment for both *Sarkara* and *Ashmari*. *Kutaja* has tikta, *kshaya rasa; sheeta virya; katu vipaka* and is *kapha pitta samaka* while its seeds are *tridoshaghna*. Also there is only one animal study done on *Holarrhena antidysenterica* outside India whose findings suggest that *Holarrhena antidysentrica's* preventive effect in urolithiasis is mediated through multiple pathways, including inhibition of CaOx crystal aggregation, antioxidant, and epithelial cell protective effects [13]. Hence the study is planned to see efficacy of *Kutaja Beeja Churna* in management of *Mutrashmari*. Since, *Kutaja* is available everywhere in India, this research will help provide simple, safe, affordable and cost-effective preparation and good remedies for managing *Mutrashmari*. Therefore this work will serve as a torchbearer in further similar research works. If the proposed study yields a favourable result, that is, if the signs and symptoms of *Mutrashmari* are eased along with the passing of calculi, it will set a benchmark and provide the best parallel method for the treatment of Mutrashmari (Urolithiasis).

Acknowledgement

The authors recognise the invaluable assistance provided by the scholars whose articles are mentioned and referenced in this manuscript. The authors are also appreciative to the authors, editors, and publishers of all the papers, journals, and books that were used to review and debate the literature for this work.

REFERENCES

[1] Sharma PV, Samhita C, Chikitsa Sthaana 26/36-40, 76; Chaukhambha Orientalia, Varanasi, Rep ed. 2008; p. 424-425, 431.
[2] Srikanthamurthy KR, Sushrutaa Samhita, Sutrasthana 33/4, Chaukhambha Orientalia, Varanasi, Rep ed. 2014; p. 233.
[3] Srikanthamurthy KR, Sushrutaa Samhita, Nidanasthana 3/3-12, Chaukhambha Orientalia, Varanasi, Rep ed. 2014; p. 483-486.
[4] Srikanthamurthy KR, Sushrutaa Samhita, Chikitsasthana 7/3-38, Chaukhambha Orientalia, Varanasi, Rep ed. 2014; p. 87-94.
[5] Ansari K. A comparative clinical evaluation of Kushadi Kwath ghan vati and Varunadi Kwath ghan vati in the management of *Ashmari* w.s.r. to Urolithiasis. Eur J Biome Phar Sci. Res. 2017;4(8):1107-13.
[6] Tiselius H G. Stone incidence and prevention. Braz J Uro Res. 2000;26(5):452-62.
[7] Arawatti S, Murthy S, Pandey BB, Shringi MK. Management of urolithiasis (*Mutrashmari*) by an ayurvedic preparation *Varuna Mula twak Kashaya*. J Homeop Ayurv Med Rev. 2012;1(4):115. Doi: 10.4172/2167-1206.1000115.
[8] Reynard, John, Brewster, Simon, Suzzane, Oxford handbook of urology; Oxford University press, 1st edition. Res. 2006;9:350-52.
[9] Das S. A concise textbook of Surgery; Dr. Somen Das, 13, Old Mayors's Court Kolkata, Rep ed. 2008; 57 p. 1189-1209.
[10] Cui Y, Chen J, Zeng F, Liu P, Hu J, Li H, et al. Tamsulosin as a medical expulsive therapy of ureteral stones: A systematic review and meta-analysis of randomized controlled trials. J Uro Res. 2019;201(5):950-55. https://www.auajournals.org/doi/abs/10.1097/JU.0000000000000029.
[11] Shastri L, Yogaratnakar, Uttaraardha, *Ashmari* Chikitsa, Chaukhambha Sanskrit Sansthan, Varanasi, Rep ed. 2011: p.70-75.
[12] Jamadagni PS, Pawar SD, Jamadagni SB, Chougule S, Gaidhani SN, Murthy SN. Review of *Holarrhena antidysenterica* (L.) Wall. ex A. DC.: Pharmacognostic, pharmacological, and toxicological perspective. Phcog Res. 2017;11:141-44.
[13] Khan A, Khan SR, Gilani AH. Studies on the in vitro and in vivo antiurolithic activity of Holarrhena antidysenterica. Urol Res. 2012; 40(6):671-81.
[14] Vidyasagar SP. Sharangdhara Samhita of Sri Sharangadharacarya with commentaries Adhamalla's Dipika and Kashiram's Gudarthdipika, Madhyamakhanda. Chapter 6. Verse-1-6. (1st ed. Varanasi, India: Chaukhambha Surbharati Prakashan; 2006.
[15] Kunal K. Management of Mutrashmari with shigru mula kwatha. Int J Curr Res, Res. 2017;9(06):53242-46.

PARTICULARS OF CONTRIBUTORS:
1. PG Scholar, Department of Shalya Tantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Wardha, Maharashtra, India.
2. Associate Professor, Department of Shalya Tantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Akshay Kumar,
RZ-23, C Block, New Heera Park, Dichaon Road, Najafgarh, Delhi-110043, India.
E-mail: akshaykumarkaushik95@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: May 16, 2022
- Manual Googling: Aug 08, 2022
- iThenticate Software: Aug 26, 2022 (14%)

ETYMOLOGY: Author Origin

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **May 13, 2022**
Date of Peer Review: **Jun 23, 2022**
Date of Acceptance: **Aug 09, 2022**
Date of Publishing: **Sep 01, 2022**