A Survey Study on Etiological factors of Mutrashmari (Urolithiasis) in Perspective of Ayurved and Contemporary Era

Krushna Chaitanya Patnai\textsuperscript{1}, Seema H. Thakare\textsuperscript{2}, Prashil P. Jumade\textsuperscript{3}, Shilpa Gaidhane\textsuperscript{4}, Rakesh Adakane\textsuperscript{5}

\textsuperscript{1}BAMS Intern, Mahatma Gandhi Ayurved College Hospital & Research Centre, Salod (H.), Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India; \textsuperscript{2}Assistant Professor, Department of Rognidan & Vikruti Vigyan, Mahatma Gandhi Ayurved College Hospital & Research Centre, Salod (H.), Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India; \textsuperscript{3}Assistant Professor, Department of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardh, Maharashtra, India; \textsuperscript{4}Professor, Department of Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India; \textsuperscript{5}Professor, Department of Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardha, Maharashtra, India; \textsuperscript{6}Professor, Mechanical Engineering, Yeshwantrao Chavan College of Engineering, Nagpur, Maharashtra, India.

\textbf{ABSTRACT}

\textbf{Background:} Mutrashmari is one of the most common conditions in which stone formed in the urinary tract. The word Ashmari in Sanskrit denotes the stone or calculi and Mutra means urine which is carried by Mutravaha Srotas. According to Acharya Sushruta Mutrashmari is one among the Ashta Mahagada. Mutrashmari is dreadful and has the potential to disturb the anatomy and physiology of the urinary system. Once it formed in the body it tends recurrence thus get difficult to cure & hence Acharyas called it as Mahagada. In modern medical science, it can be correlated with Urinary Calculi or Urolithiasis based on their signs and symptoms. Factors like diet, water, climate, geographical conditions are responsible for the formation of calculi.

\textbf{Objectives:} To compare etiological factors of Mutrashmari mentioned in Ayurveda and contemporary era. To put forth the recommendations based on study results.

\textbf{Methodology:} This is a descriptive cross-sectional study conducted at AVBRH, Sawangi (Meghe) Wardha. Total of 60 diagnosed patients selected by simple random sampling method was enrolled in the study. Patients were contacted and interviewed at urology OPD of AVBRH Sawangi (Meghe) twice a week with a semi-structured questionnaire. The study will be conducted in 3 months during which data will be collected as per the questionnaire. Discussion: This cross-sectional study helps to provide data regarding etiological factors for Mutrashmari (Urolithiasis) from both Ayurveda and Contemporary view.

\textbf{Key Words:} Ayurveda, Etiological factors, Mahagada, Mutrashmari, Urolithiasis

\section*{INTRODUCTION}

Mutrashmari is one of the most common conditions in which stone formed in the urinary tract. The word Ashmari in Sanskrit denotes the stone or calculi and Mutra means urine which is carried by Mutravaha Srotas. According to Acharya Sushruta Mutrashmari is one among the Ashta Mahagada.\textsuperscript{1} Mahagada means which is dreadful, incurable one and major disease in terms of its severe morbidity.\textsuperscript{2} Mutrashmari is dreadful and has potential to disturb the anatomy and physiology of urinary system. Once it formed in the body it tends recurrence thus get difficult to cure and hence Acharyas called it as Mahagada. Also, the location of ashmari is described as Basti which is one of the important trimarma (Three vital parts).\textsuperscript{3} The region where marma is located have tridosha, triguna, bhutatma and chetana dhatu.\textsuperscript{4,5} This indicates the importance of disease and invites its critical study. Acharya Sushruta the father of surgery has explained the formation of Ashmari in details including Nidana, Samprapti, Purvarupa, Rupa, Bheda, Upadraya and Chikitsa in a most scientific manner while Acharya Charaka explained it under Mutrakrichchha Vyadhi.

In modern medical science, it can be correlated with Urinary Calculi or Urolithiasis based on their signs and symptoms. It affects all age groups and both sexes but the peak incidence is observed in 2\textsuperscript{nd} to 3\textsuperscript{rd} decades of life with a male-female ratio of 2:1.\textsuperscript{6} The stones may be present at different sites such...
as in kidney, ureter, bladder or urethra. Among the urological diseases, Urolithiasis is the third most common disease in the world. In industrialized countries, there is a considerable increase in the prevalence of Urolithiasis in the present century. From the whole world, overall 3-20% population develops one urinary stone from 70 yrs life span. Factors like dietary habits, climate, environment, ethnicity, heredity etc. are responsible for varying prevalence of Urolithiasis. Some other factors like nutritional pattern, changing lifestyle, less physical activity, high intake of energy, excess consumption of food rich in proteins, carbohydrates & fats, excess alcohol consumption, smoking, prolonged stress are act as exogenic risk factors for Urolithiasis. Adequate fluid intake and dietary modifications might successfully prevent stone recurrence.

_Mutrashmari_ has become a very common health issue in India. According to the study conducted by Ayush Lohia et al. The lifetime prevalence of renal stones was found to be 7.9%. Ayurveda relies on treating the disease at its root cause. Nidanparivarjan i.e. avoidance of the etiological factor is the first step of treatment which prevents further disease progression. So Knowledge of etiological factors responsible for the genesis of particular diseases is always important for a successful treatment. _Mutrashmari_ is closely related to the causes such as unhealthy diet, habits and environment which are subjective. Which etiological factors of _Mutrashmari_ mentioned in Ayurveda are frequent and which are the other factors in the contemporary era responsible for _Mutrashmari_ is also needed to be studied. It is also necessary to know the various etiological factors of _Mutrashmari_ which helps to understand the _Samprapti_ (pathogenesis) properly and render the treatment precisely.

**OBJECTIVES**

- Comparative study of etiological factors of _Mutrashmari_ mentioned in Ayurveda and contemporary era.
- To put forth the recommendations based on study results.

**Case Definition**

The patient with stones in the urinary tract diagnosed by Uro surgeon with the confirmatory evidence from investigations like USG, X-Ray –KUB, CT Scan etc.

**MATERIALS AND METHODS**

**Study design:** This is a descriptive cross-sectional study conducted at AVBRH, Sawangi (Meghe) Wardha. Total of 60 diagnosed patients selected by simple random sampling method was enrolled in this study. Patients were contacted and interviewed at urology OPD of AVBRH Sawangi (Meghe) twice a week with semi-structured questionnaire and data will be collected as per the questionnaire. Ethical Committee approval has been obtained from the Institutional Ethical Committee, MGACH and RC, Salod (H), Wardha.

**Setting:** The study will be conducted at AVBRH, Sawangi (Meghe) Wardha. The Subjects of study will be recruited from the sign and symptoms of Urolithiasis from Urology OPD of AVBRH, Sawangi (Meghe) Wardha. In one visit 5 patients will be visited. The study will be conducted in 3 months during which data will be collected as per the questionnaire.

**Participants:** The patient with stones in the urinary tract diagnosed by Urosurgen with the confirmatory evidence from investigations like UGG, X-Ray –KUB, CT Scan etc. will be selected for the study. Involvement in the study is voluntary. Inclusion and exclusion criteria are the base for enrolment. Diagnosed patients of _Mutraashmari_ (Urolithiasis) willing to participate are enrolled in the study.

**Inclusion and Exclusion Criteria:**

Patients diagnosed with _Mutashmari_ (urolithiasis) and willing to participate were included in this study while critically ill patients and those who are not willing will be excluded from the study.

**Bias:** To minimize the bias each participant will be selected randomly by a simple random sampling method.

**Sample size:** According to a study conducted by AyushLohiya et al. lifetime prevalence of urinary stones was 7.9%. Considering this reference and by using prevalence formula sample size was calculates as,

\[ N = 4pq/L^2 = 4 \times 7.9 \times 92.1 / 7^2 = 2910.36/49 = 59.4 \approx 60 \]

So the total participants included in the study were 60.

**Recruitment:**

People who are willing to participate in this study will be provided details regarding the study by verbal explanation. Then if the participant will agree with given information provided with the questionnaire. Each participant will be given written informed consent. Physical and general examinations will be done before starting core data collection along with PI. Recruited participant must include in eligibility criteria.

**Baseline assessment:**

Symptoms of _Mutrashmari_ (Urolithiasis), investigations like USG, X-ray –KUB, CT Scan etc. will be assessed at baseline.

**Ethical Consideration:**

Ethical Approval obtained from the Institutional Ethical Committee, MGACH and RC, Salod (H), Wardha.
Method of data analysis:
Statistical analysis must be done by applying the “Unpaired t-test”. This test of comparison is used to compare the etiological factors of Mutrashmari (Urolithiasis) according to Ayurveda & Modern science.

Strengths: Ayurveda mentioned more précised etiological factors which may help cure Mutrashmari.

Limitations: Other than etiological factors mentioned in Ayurveda due to modified lifestyle there may be changes in etiological factors which are mentioned in the contemporary era.

EXPECTED RESULTS
Results will be obtained by the data collected from the questionnaire regarding diet, lifestyle, water intake, habits, climate, and geographical conditions etc. which are responsible for the formation of calculi.

DISCUSSION
Various earlier studies have proved that the formation of Mutrashmari can be controlled by avoiding etiological factors responsible for the manifestation of Mutrashmari. Many studies on kidney and urinary system disorders from this region are available. Dietary habits and lifestyle changes which are the main causes for the formation of stone can be controlled by proper explanation to the patients which is explained by peer sages of ancient about the avoiding of the cause i.e Nidanparivarjan. This study will be useful to know the causative factors of Mutrashmari in both Ayurveda and Contemporary sciences which helps to understand the etiological factors and avoid them by which Mutrashmari can be controlled. Hagone et al. reported a case of management of glomerulonephritis through Ayurveda. Gadewar et al studied the dynamics of electroencephalogram (EEG) in different stages of chronic kidney disease. Kumar et al reported on Symptoms and Signs Predict Reduced Renal Function among Hospitalized Adults.

CONCLUSION
Appropriate conclusion will be drawn from the collected data at the end study.

ACKNOWLEDGMENT
Authors acknowledge the immense help received from the scholars whose articles are cited and included in references to this manuscript. The authors are also grateful to authors / editors / publishers of all those articles, journals, and books from which the literature for this article has been reviewed and discussed.

Conflict of Interest: Nil
Source of Funding: Nil

REFERENCES
1. Bhende SV, Parwe S. Ayurveda management of Mutrashmari with special respect to urolithiasis: A case study. J Indian Syst Med 2019;7(3):189.
2. Lahri N. Concept of Mahagad In Ayurveda WSR to Bhagandar. J Ayu Integr Med Sci 2016;1(2):17-23.
3. Verma V. Efficacy of Nagaradi Vati In the Management of Mutrashmari wsr to Urolithiasis. Asian J Pharmacae 2016; 9(4).
4. Kumar K, Singh K, Patil A. The Clinical and Surgical Perspective of Tri-marma. WOPMR 2019,5(3), 76-77
5. Solanki NS, Jain N. Introduction of Trimarma with Special Reference to Sirah Marma. Int J Health Sci Res 2018; 8(12):156-9.
6. Mohan Harsh, Text Book Of Pathology, Edition-Sixth, New Delhi, Jaypee Brothers Medical Publishers (P) Ltd; 2010:690.
7. Prakash R. Prevalence and socio-demographic status on kidney stone patients in Thanjavur district, Tamil Nadu, India. Int J Comm Med Public Health 2019;6(5):1943.
8. Sorensen MD, Chi T, Shara NM, Wang H, Hsi RS, Orchard T, et al. Activity, energy intake, obesity, and the risk of incident kidney stones in postmenopausal women: a report from the Women's Health Initiative. J Am Soc Nephrol 2014;25(2):362-9.
9. Straub M, Hautmann RE. Developments in stone prevention. Curr Opin Urol 2005;15(2):119-26.
10. Lohiya A, Kant S, Kapil A, Gupta SK, Misra P, Rai SK. Population-based estimate of urinary stones from Ballabgarh, northern India. Nat Med J India 2017;30(4):198.
11. Sharma PV, Susruta Samhita, Uttartantra, Vol-III, Chapter 1/110, Reprint 2005 Varanasi; Chaukhamba Vishvabharathi Publishers; p.110.
12. Balwani M, Bawankule C, Ramteke V, Pasari A. Hepatitis C virus, directly acting antivirals and Guillain-Barré syndrome. Saudi J Kidney Dis Transpl 2018;29(5):1237.
13. Balwani MR, Pasari A, Tolani P. Widening spectrum of renal involvement in psoriasis: First reported case of C3 glomerulonephritis in a psoriatic patient. Saudi J Kidney Dis Transpl 2019 Jan 1;30(1):258.
14. Varyani UT, Shah NM, Shah PR, Kute VB, Balwani MR, Trivedi HL. C1q nephropathy in a patient of neurofibromatosis type 1: A rare case report. Indian J Nephrol 2019 Mar;29(2):125.
15. Hagone PA, Kuchewar V. Management of Glomerulonephritis through Ayurveda- A Case report. Int J Ayu Med 2019;10(4):3457.
16. Gadewar P, Acharya S, Khairkar P, Shukla S, Mahajan SN. Dynamics of electroencephalogram (EEG) in different stages of chronic kidney disease. J Clin Diagn Res 2015 Mar;9(3):OC25.
17. Kumar S, Joshi R, Joge V. Do clinical symptoms and signs predict reduced renal function among hospitalized adults?. Ann Med Health Sci Res 2013;3(3):492-7.