Kaphaja Ashmari w.s.r. to Nephrolithiasis: An Ayurvedic and Contemporary Review of Aetiopathogenesis Clinical Features and Management

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***Abstract*—Ashmari is an important urological disorder described in classical Ayurvedic literature, characterised by the formation of calculi within the urinary system. Among its four types, Kaphaja Ashmari possesses distinct clinical characteristics attributed to the involvement of Kapha Dosha. In contemporary medicine, nephrolithiasis refers to the formation of stones within the kidneys and urinary tract, representing a significant health concern due to its recurrence and associated complications. The present review aims to explore the Ayurvedic and contemporary perspectives of Kaphaja Ashmari with special reference to nephrolithiasis, focusing on its aetiopathogenesis, clinical manifestations, diagnosis and management. Classical Ayurvedic descriptions from authoritative texts are examined to understand the role of Nidana, Dosha-Dushya involvement and Samprapti in stone formation. The contemporary understanding includes urinary supersaturation, crystal nucleation, aggregation and other metabolic and environmental risk factors contributing to calculus formation. Clinical features and diagnostic approaches described in Ayurveda are discussed alongside modern investigations, including urine analysis and imaging techniques. Furthermore, Ayurvedic therapeutic principles, including Shodhana, Shamana, medicinal formulations and dietary recommendations, are reviewed in relation to contemporary treatment modalities. This comparative review highlights conceptual similarities and differences between the two systems and identifies opportunities for further scientific investigation. It may provide a foundation for understanding Kaphaja Ashmari through an integrative perspective and encourage evidence-based research into preventive and therapeutic approaches for nephrolithiasis.**

***Index Terms*—Kaphaja Ashmari, Nephrolithiasis, Urolithiasis, Aetiopathogenesis, Ayurveda, Integrative Management.**

I. INTRODUCTION

Ashmari is an important urological disorder described in classical Ayurvedic literature, characterised by the formation of stone-like concretions within the urinary system. It is considered a significant disease because of its painful manifestations, difficulty in urination and potential complications. Acharya Sushruta has provided a detailed description of its aetiology, classification, clinical features and management in Nidana Sthana. Four types of Ashmari, namely Vataja, Pittaja, Kaphaja and Shukraja Ashmari, have been described, highlighting the importance of different pathological factors in urinary calculus formation. [1]
In contemporary medicine, nephrolithiasis refers to the formation of calculi within the kidneys, whereas urolithiasis includes stone formation anywhere in the urinary tract. It is a common urological condition influenced by geographical, climatic, dietary, metabolic and genetic factors. Urinary calculi are composed of different crystalline substances, including calcium oxalate, calcium phosphate, uric acid, struvite and cystine. The disease may present with renal colic, flank pain, haematuria, nausea, vomiting and urinary disturbances. Recurrent stone formation remains an important clinical concern

because of its impact on patient health and quality of life. [2]

From the Ayurvedic perspective, Kaphaja Ashmari is described as a distinct variety of Ashmari associated with the predominance of Kapha Dosha. According to Acharya Sushruta, improper dietary habits and inadequate purification of the body contribute to the development of this condition. The characteristic features of Kaphaja Ashmari include a whitish appearance, smooth surface, considerable size and resemblance to the fruit of Kapittha. These classical descriptions provide an important basis for understanding the Ayurvedic concept of urinary stone formation. [3]

The contemporary understanding of nephrolithiasis explains stone formation through several interrelated mechanisms, including urinary supersaturation, crystal nucleation, crystal growth, aggregation and retention within the urinary tract. Reduced fluid intake, dietary factors, metabolic abnormalities, obesity, genetic predisposition and certain systemic disorders may increase the risk of stone formation. Urinary pH, volume and the concentration of stone-forming substances also play important roles in the development of calculi. [4]

Although Ayurveda and contemporary medicine explain urinary stone formation through different theoretical frameworks, both recognise the importance of dietary habits, lifestyle and physiological disturbances in disease development. However, Kaphaja Ashmari should not be considered an exact equivalent of any particular modern urinary stone composition without appropriate clinical and analytical evidence. A comparative understanding of these concepts may help identify areas for further scientific investigation. [5]

The present review aims to explore Kaphaja Ashmari with special reference to nephrolithiasis through an integrated Ayurvedic and contemporary perspective. It focuses on the aetiology, pathogenesis, clinical manifestations, diagnostic approaches and management of the condition. Furthermore, it discusses Ayurvedic therapeutic principles, including Shodhana, Shamana, medicinal formulations and dietary recommendations, in comparison with contemporary medical and surgical interventions. This review may provide a foundation for further research and evidence-based approaches towards the prevention and management of urinary stone disease. [6]

II. CONCEPTUAL UNDERSTANDING OF ASHMARI IN AYURVEDA

2.1 Concept of Ashmari

The term Ashmari is derived from the Sanskrit word Ashma, meaning stone, indicating a pathological condition characterised by the formation of stone-like structures within the urinary system. In Ayurveda, Ashmari is described as an important disorder involving the urinary bladder and urinary passages. Acharya Sushruta has explained its aetiology, clinical manifestations, classification and management in detail in the third chapter of Nidana Sthana. The disease is considered significant because of its painful symptoms and the possibility of urinary obstruction. [6]

2.2 Classification of Ashmari

According to Acharya Sushruta, Ashmari is classified into four major types based on the predominance of different pathological factors. These include Vataja Ashmari, Pittaja Ashmari, Kaphaja Ashmari and Shukraja Ashmari. The classical text also explains that Kapha provides the underlying basis for the formation of the first three types, while the involvement of Vata and Pitta contributes to their distinct characteristics. This classification represents the Ayurvedic approach to understanding variations in the formation and clinical presentation of urinary calculi. [7]

Table 1. Classification of Ashmari according to Ayurveda

Type	Predominant factor	Classical description
Vataja Ashmari	Vata	Rough, hard and irregular
Pittaja Ashmari	Pitta	Reddish, yellowish or dark appearance
Kaphaja Ashmari	Kapha	White, smooth and relatively large
Shukraja Ashmari	Shukra	Associated with abnormal accumulation of semen

[8]

2.3 General Aetiology of Ashmari

Acharya Sushruta describes that individuals who regularly consume unwholesome food and neglect appropriate bodily purification may develop an aggravation of Kapha. The aggravated Kapha, after mixing with urine, enters the urinary bladder and contributes to the formation of Ashmari. The classical description emphasises the role of improper dietary habits and physiological disturbances in the development of urinary calculi. It also establishes the importance of maintaining proper dietary and lifestyle practices for preventing the disease. [9]

2.4 Concept of Kaphaja Ashmari

Kaphaja Ashmari, also described as Shleshmashmari, is a specific variety of Ashmari associated with the predominance of Kapha. According to Acharya Sushruta, excessive consumption of Kapha-promoting food substances contributes to the development and progressive enlargement of the calculus. The stone gradually increases in size and may obstruct the urinary passage at the opening of the bladder. This obstruction produces characteristic symptoms such as heaviness, cold sensation and severe pain in the bladder region. [10]

2.5 Characteristic Features of Kaphaja Ashmari

Acharya Sushruta has described specific morphological and clinical characteristics of Kaphaja Ashmari. The calculus is generally described as white, smooth, glossy and comparatively large, resembling a hen's egg or the colour of the Madhuka flower. The associated bladder symptoms include a sensation of heaviness, coldness and pain resembling bursting or pricking. These classical features help distinguish Kaphaja Ashmari from other varieties of Ashmari described in Ayurvedic literature. [11]

III. CONTEMPORARY UNDERSTANDING OF NEPHROLITHIASIS

3.1 Definition of Nephrolithiasis

Nephrolithiasis is a urological condition characterised by the formation of solid crystalline deposits within the kidneys due to the precipitation of dissolved substances present in urine. These deposits are commonly known as renal calculi or kidney stones. Depending on their location, urinary calculi may develop in the kidneys, ureters or urinary bladder. The condition may remain asymptomatic in some individuals, whereas in others it can produce severe pain, urinary obstruction, haematuria and associated complications. [12]

3.2 Types of Urinary Stones

Urinary calculi are classified according to their chemical composition. The major types include calcium oxalate, calcium phosphate, uric acid, struvite and cystine stones. Calcium-containing stones are the most frequently encountered, particularly calcium oxalate calculi. Each type has distinct physicochemical characteristics and predisposing factors. Identification of stone composition is important for determining the underlying cause, selecting appropriate treatment and preventing recurrence. [13]

3.3 Epidemiology and Prevalence

Nephrolithiasis is a common urological disorder with an increasing prevalence worldwide. It affects individuals across different age groups and geographical regions, although its occurrence varies according to climatic conditions, dietary patterns, socioeconomic status and genetic susceptibility. The prevalence is estimated to affect approximately 10–15% of the population in several regions. The disease is more frequently reported in males, although the incidence among females has also increased in recent years. Recurrence is another important characteristic of kidney stone disease, making long-term prevention and follow-up essential components of clinical management. [14]

3.4 Risk Factors of Nephrolithiasis

The development of nephrolithiasis is influenced by multiple dietary, metabolic, environmental and hereditary factors. Inadequate fluid intake and reduced urinary volume increase the concentration of stone-forming substances in urine, thereby promoting crystal formation. Excessive sodium intake, high animal-protein consumption and dietary patterns rich in certain stone-forming substances may further increase the risk. Obesity, diabetes mellitus, hyperparathyroidism, recurrent urinary tract infections and certain gastrointestinal disorders are also recognised as important predisposing conditions. [15] Dietary habits play a particularly important role in the development and recurrence of kidney stones. High

sodium consumption may increase urinary calcium excretion, while excessive animal protein intake can influence urinary calcium, citrate and uric acid levels. Conversely, adequate fluid intake and a balanced diet containing appropriate amounts of dietary calcium, fruits and vegetables may help reduce stone formation. Therefore, dietary assessment and individualised nutritional recommendations are important aspects of nephrolithiasis prevention. [16]

IV. AETIOPATHOGENESIS OF NEPHROLITHIASIS

Nephrolithiasis develops through a complex process involving changes in urinary composition, crystal formation and retention within the kidneys. The major stages include urinary supersaturation, crystal nucleation, crystal growth, aggregation and retention. These processes are influenced by urinary pH, fluid intake, metabolic abnormalities and the balance between crystallisation promoters and inhibitors. [17]

4.1 Urinary Supersaturation

Urinary supersaturation occurs when the concentration of stone-forming substances, such as calcium, oxalate, phosphate and uric acid, exceeds their solubility limits. Reduced urinary volume increases the concentration of these substances and favours crystal formation. [18]

4.2 Crystal Nucleation

Nucleation is the initial stage of crystal formation in which dissolved minerals combine to form small, stable crystal nuclei. It may occur spontaneously in urine or on existing surfaces, including damaged renal epithelial cells and Randall's plaques. [19]

4.3 Crystal Growth and Aggregation

Following nucleation, additional mineral ions attach to the existing crystals, resulting in their growth. Multiple crystals may subsequently combine through aggregation to form larger particles. Urinary citrate and magnesium act as important inhibitors of these processes. [20]

4.4 Crystal Retention

Crystal retention occurs when formed crystals adhere to renal tubular epithelial cells or remain attached to renal papillary structures instead of being eliminated through urine. Epithelial injury and local inflammatory responses may facilitate crystal adhesion and contribute to progressive stone development. [21]

V. CLINICAL FEATURES OF KAPHAJA ASHMARI AND NEPHROLITHIASIS

5.1 Clinical Features of Kaphaja Ashmari

According to Acharya Sushruta, Kaphaja Ashmari is characterised by a white, smooth, glossy and relatively large calculus. The stone resembles a hen's egg or the colour of the Madhuka flower. Its growth may obstruct the urinary passage, producing heaviness, cold sensation and severe pain in the bladder region. Difficulty in urination is an important clinical manifestation. [22]

5.2 Clinical Features of Nephrolithiasis

The clinical presentation of nephrolithiasis depends on the size, location and degree of urinary obstruction caused by the calculus. Common manifestations include:

- Renal colic: Severe pain in the flank, sometimes radiating towards the groin.
- Haematuria: Presence of blood in urine.
- Dysuria: Pain or burning sensation during urination.
- Nausea and vomiting: Frequently associated with acute renal colic.
- Urinary disturbances: Increased frequency, urgency or difficulty in passing urine.
- Fever: May indicate an associated urinary tract infection. [23]

5.3 Comparative Clinical Features

The Ayurvedic description of Kaphaja Ashmari and contemporary nephrolithiasis provides different perspectives on urinary stone disease. Both descriptions recognise urinary obstruction, pain and difficulty in urination as important clinical manifestations. However, the classical morphological characteristics of Kaphaja Ashmari cannot independently establish the chemical composition of a modern renal calculus.

Ayurvedic description	Contemporary clinical correlation
Basti Shoola	Bladder or lower urinary tract pain
Mutrakrichchhra	Difficulty or painful urination

Gurutva	Sensation of heaviness
Mutradhara Sanga	Obstructed urinary flow
Sarudhir Mutrata	Haematuria

[24]

VI. DIAGNOSTIC APPROACHES

The diagnosis of Ashmari and nephrolithiasis involves clinical assessment, evaluation of urinary symptoms and appropriate investigations. An integrated approach helps identify the presence, location, size and possible composition of urinary calculi.

6.1 Ayurvedic Clinical Assessment

In Ayurveda, the assessment of Ashmari is based on detailed history-taking and examination of clinical manifestations. Important considerations include dietary habits, lifestyle, urinary complaints, pain characteristics and features associated with different types of Ashmari. The classical concepts of Nidana, Purvarupa and Rupa help in understanding the disease presentation.

6.2 Urine Examination

Urine examination is an important diagnostic investigation in nephrolithiasis. Routine urinalysis includes assessment of urine pH, specific gravity, red blood cells, white blood cells, protein and crystals. Urine culture is recommended when urinary tract infection is suspected. These findings help identify associated abnormalities and possible infection. [25]

6.3 Blood Investigations

Blood investigations help evaluate renal function and identify metabolic abnormalities associated with stone formation. Important investigations include:

- Serum creatinine and blood urea.
- Serum calcium.
- Serum uric acid.
- Serum electrolytes.
- Complete blood count, when clinically indicated.

These investigations provide information about renal function, metabolic disturbances and possible complications. [26]

6.4 Imaging Techniques

Imaging plays a significant role in confirming nephrolithiasis and determining the location, size and number of calculi.

- Ultrasonography (USG): Commonly used for initial assessment; it can identify renal calculi and urinary tract dilatation.
- X-ray KUB: Helps detect radiopaque urinary calculi.
- Non-contrast Computed Tomography (NCCT): Provides accurate information regarding stone size, location, density and surrounding structures. It is particularly useful in suspected acute renal colic. [27]

6.5 Stone Composition Analysis

Analysis of a retrieved urinary calculus helps determine its chemical composition and identify factors responsible for stone formation. Infrared spectroscopy and X-ray diffraction are preferred analytical techniques. This information is useful in selecting appropriate preventive and therapeutic strategies and reducing recurrence. [28]

VII. MANAGEMENT OF KAPHAJA ASHMARI AND NEPHROLITHIASIS

The management of Ashmari aims to relieve pain, facilitate the elimination of calculi, prevent urinary obstruction and reduce recurrence. Ayurveda describes different therapeutic approaches according to the type, severity and clinical presentation of the disease. Contemporary medicine focuses on stone size, location, composition, associated complications and renal function.

7.1 Ayurvedic Management of Kaphaja Ashmari

Ayurvedic management of Kaphaja Ashmari is based on the principles of removing accumulated pathological factors, improving urinary flow and preventing further stone formation. Acharya Sushruta has described different treatment approaches, including Shodhana, Shamana and surgical intervention, depending on the severity and stage of the disease. Dietary regulation and lifestyle modification are also considered important components of management. [29]

7.2 Shodhana Chikitsa

Shodhana Chikitsa refers to purification-based therapeutic procedures described in Ayurveda. Classical management of Ashmari includes procedures intended to eliminate aggravated pathological factors and restore physiological balance.

Selection of these procedures depends on the patient's condition and should be undertaken under the supervision of a qualified Ayurvedic physician. [30]

7.3 Shamana Chikitsa and Ayurvedic Formulations

Shamana Chikitsa involves the use of medicinal preparations to manage symptoms and support physiological functions. Classical Ayurvedic literature describes various herbal and compound formulations for Ashmari. Preparations containing Gokshura, Punarnava, Pashanabheda and other traditionally used medicinal plants are discussed in Ayurvedic practice for urinary disorders. However, their clinical effectiveness in different stone types requires further well-designed scientific evaluation. [31]

7.4 Dietary and Lifestyle Management

Dietary regulation is an essential part of Ayurvedic management. Pathya includes adequate fluid intake, light and easily digestible food and appropriate lifestyle practices, whereas Apathya involves excessive consumption of heavy, oily and unhealthy food. Regular physical activity and maintaining adequate hydration may support urinary health and help reduce the risk of stone formation. [32]

7.5 Contemporary Medical Management

Contemporary management depends on the size, location and composition of the calculus, along with the patient's clinical condition.

- Conservative management: Observation and adequate hydration may be appropriate for selected small stones.
- Medical expulsive therapy: Alpha-blockers may facilitate the passage of selected distal ureteric stones, particularly those larger than 5 mm.
- Extracorporeal Shock Wave Lithotripsy (ESWL): Uses externally generated shock waves to fragment urinary calculi.
- Ureteroscopy (URS): Involves endoscopic removal or fragmentation of stones.
- Percutaneous Nephrolithotomy (PCNL): Commonly recommended for large renal calculi, particularly those exceeding 2 cm. [33]

7.6 Prevention of Recurrence

Prevention focuses on maintaining adequate fluid intake, dietary modification and correction of underlying metabolic abnormalities. Patients with calcium stones should generally maintain normal dietary calcium intake while limiting excessive sodium consumption. Metabolic evaluation and appropriate pharmacological interventions may be required in individuals with recurrent stone formation. [34]

VIII. COMPARATIVE DISCUSSION OF AYURVEDIC AND CONTEMPORARY CONCEPTS

The Ayurvedic and contemporary medical systems provide different but complementary perspectives on urinary stone disease. Ayurveda explains Kaphaja Ashmari through the involvement of Kapha, dietary factors and disturbances in normal physiological processes, whereas contemporary medicine describes nephrolithiasis through urinary supersaturation, crystal formation and metabolic abnormalities. Both perspectives recognise the importance of dietary habits, lifestyle and physiological factors in disease development. [35]

8.1 Comparative Understanding of Aetiopathogenesis

In Ayurveda, the development of Kaphaja Ashmari is associated with the aggravation of Kapha and its interaction with urine, resulting in calculus formation. Contemporary medicine explains this process through increased urinary concentration of stone-forming substances, crystal nucleation, growth and aggregation. Although these explanations differ in their theoretical foundations, both highlight the role of internal physiological disturbances and dietary factors. [36]

8.2 Comparative Understanding of Clinical Features

Classical descriptions of Kaphaja Ashmari include urinary obstruction, difficulty in urination, heaviness and pain in the bladder region. Similarly, nephrolithiasis may present with renal colic, haematuria, dysuria and urinary obstruction. These similarities provide a basis for clinical comparison; however, direct equivalence between individual Ayurvedic symptoms and modern clinical findings should be interpreted cautiously. [37]

8.3 Comparative Understanding of Management

Ayurvedic management emphasises Shodhana, Shamana, medicinal formulations and dietary

regulation, whereas contemporary treatment includes conservative management, medical expulsive therapy and surgical procedures such as ESWL, URS and PCNL. Both systems give importance to dietary modification and prevention of recurrence. Scientific evaluation of Ayurvedic formulations may help establish their safety and effectiveness in specific types of urinary calculi. [38]

8.4 Scope for Integrative Research

An integrated research approach may help investigate the possible role of selected Ayurvedic medicinal formulations in urinary stone prevention and management. Future studies should include standardised drug preparations, stone composition analysis, biochemical parameters, appropriate imaging and controlled clinical trials. Such investigations may provide reliable evidence regarding the therapeutic potential of Ayurvedic interventions alongside established contemporary treatments.

IX. CONCLUSION

Kaphaja Ashmari represents an important concept in Ayurvedic understanding of urinary stone disease. Its classical description provides valuable information regarding aetiology, clinical manifestations and therapeutic principles. Contemporary medicine explains nephrolithiasis through urinary supersaturation, crystal formation and metabolic disturbances. Although both systems differ in their theoretical explanations, similarities exist in their recognition of dietary, lifestyle and physiological factors. A systematic comparative approach, supported by scientific research, may help explore the potential role of Ayurvedic interventions in the prevention and management of nephrolithiasis.

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