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Review Article

AYURVEDIC PERSPECTIVES ON CHRONIC KIDNEY DISEASE: A REVIEW OF CLASSICAL WISDOM AND CONTEMPORARY APPLICATIONS

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ABSTRACT

Chronic kidney disease (CKD) represents a progressive loss of renal function over time and poses significant challenges in global healthcare. In Ayurveda, CKD is understood as an *Upadrava* (complication) of urinary system disorders or systemic conditions such as *Prameha* (diabetes). This review explores the Ayurvedic perspective on CKD, focusing on its pathogenesis, prognosis, and therapeutic approaches. The disease is characterized by the vitiation of *Dosha* and their impact on *Basti* (renal system), leading to impaired filtration and systemic toxicity. Early stages are considered *Krucchrasadhya* (difficult to treat), whereas advanced stages are *Yapya* (manageable with palliation) or incurable. Management strategies in Ayurveda emphasize purification (*Shodhana*), pacification (*Shamana*), and rejuvenation (*Rasayana*) therapies. Detoxification procedures like *Virechana* and *Basti* therapy are employed to eliminate vitiated *Dosha* and restore systemic balance. *Rasayana* drugs such as *Punarnava*, *Gokshura*, and *Shilajit* enhance renal function, act as antioxidants, and provide nephroprotective effects. Clinical studies indicate improvements in digestion, vitality, and quality of life with these interventions. The integration of Ayurvedic principles, including dietary and lifestyle modifications, offers a holistic approach to CKD, addressing its systemic effects and slowing disease progression. This study underscores the potential of Ayurveda as a complementary and cost-effective therapeutic framework for CKD, particularly in resource-limited settings, by reducing reliance on conventional renal replacement therapies and improving patient outcomes.

INTRODUCTION

The Global Burden of Disease collaboration recognizes chronic kidney disease (CKD) as a significant contributor to worldwide morbidity and mortality.[1] From 1990 to 2017, the global prevalence and mortality rates of CKD rose by 29.3% and 41.5%, respectively. In India, the proportion of deaths due to kidney failure increased by 38% between 2001–2003 and 2010–2013[2]. CKD is also a key risk factor for cardiovascular disease (CVD), which remains the leading cause of early death and disability-adjusted life years.

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Chronic Kidney Disease (CKD) is defined by the presence of kidney damage or a sustained reduction in the estimated glomerular filtration rate (eGFR) below 60 mL/min/1.73 m^2 for at least three months, regardless of the underlying cause. [3] CKD represents a gradual decline in kidney function that may eventually necessitate renal replacement therapies, including dialysis or transplantation. Kidney damage is identified through pathological changes observed in imaging or biopsy, abnormalities in urine sediment, or elevated urinary albumin excretion levels.

In developing countries like India, opportunities for secondary and tertiary prevention of CKD are frequently overlooked.[4] Patients often seek medical care only after symptoms appear, typically in the advanced stages of the disease. Early detection of CKD usually occurs incidentally during evaluations for other health issues or, less commonly, through routine screening[5]. Since the burden of CKD is disproportionately higher in regions with lower socio-

demographic indices, global success in addressing CKD depends on tackling the unique challenges these areas face, including risk factor identification and effective intervention strategies.

The economic and social impacts of CKD are profound, particularly in the context of end-stage renal disease (ESRD). The monthly cost of haemodialysis (HD) in private hospitals averages ₹12,000, with annual expenses reaching approximately ₹140,000. Kidney transplantation, while potentially more cost-effective in the long term, has an upfront cost ranging from ₹50,000 in government facilities to ₹300,000 in private hospitals. Post-transplant, the yearly maintenance for immunosuppressive drugs amounts to ₹120,000 or ₹10,000 per month.[6] These costs make conventional management approaches, including dialysis and transplantation, unaffordable and inaccessible for a significant portion of the Indian population.

Given these challenges, there is an urgent need to explore safe and effective alternative therapies that can reduce the reliance on dialysis and delay the need for renal transplantation. Developing such interventions could alleviate the economic burden and improve the quality of life for patients with CKD.

Ayurveda provides a comprehensive approach to maintaining renal health and managing kidney disorders, focusing on prevention, timely intervention, and holistic care. It emphasizes maintaining the integrity of the urinary system through simple yet effective practices like honouring natural urges, adopting hygienic living routines, and adhering to seasonal and daily regimens. Early detection and management of urinary ailments are prioritized to prevent progression. Detoxification therapies such as *Virechana* and *Basti* are integral, not just for cleansing but also for restoring the functional harmony of the body. Ayurvedic formulations, derived from medicinal plants, play a vital role in safeguarding renal tissues and mitigating damage. Even in advanced stages of kidney disorders, the science advocates the use of *Rasayana* drugs to rejuvenate the kidneys and bolster the overall vitality of patients, highlighting the importance of both physical and psychological resilience in healing. This multidimensional approach underscores the potential of Ayurveda in offering both preventive and therapeutic solutions to kidney health.

Aim

To explore the Ayurvedic understanding and management of chronic kidney disease (CKD) through classical texts.

Objective

To evaluate the efficacy of Ayurvedic therapies, including *Samshodhana* procedures and nephro-protective medicinal plants, in the management of chronic kidney disease.

Material and Methods

This review utilized classical Ayurvedic texts to analyse kidney-related concepts and management principles. Contemporary research articles from databases like PubMed and AYUSH portals were reviewed for evidence on Ayurvedic therapies in CKD. Key findings were synthesized to correlate classical wisdom with modern applications.

Ayurvedic Review

In Ayurveda, the term "*Basti*" is often associated with the urinary system, as it is frequently mentioned in the context of processes such as *Mutranirmana* (formation of urine), *Mutraghata* (obstruction of urine), *Mutrakrcchra* (difficult urination), *Mutrashmari* (urinary stones), and the pathogenesis of *Prameha* (diabetes).

Chronic kidney disease has no direct link to any of the Ayurvedic classics' clinical entities. All disorders cannot be labelled with a name, as stated in *Charaka Samhita* (A key textbook for Ayurveda medicine) *Sutrasthana Trisothiyadhyaya*. The physician should never be embarrassed if he or she does not understand the disease's name. In many cases, the same *Dosha* may circulate to other parts of the body, causing other diseases, so the treatment of the disease should be targeted once the location of the disease and its causes are determined. The diseases can be studied as provoked *Dosha*, specific causes, and their sites.[7] Good knowledge of *Vikara Prakarti*, *Adhishthanantarani* and *Samutthana Vishesha* is important for *Nidana* and *Chikitsa*.[8] An Ayurvedic physician can be understood the disease and its process thoroughly.

1. *Vikara Prakriti* (state of vitiated *Dosha*, *Dhatu*, and *Mala* which causing the disease)
2. *Adhishthanantarani* (site of vitiated *Dosha*)
3. *Samutthana Vishesha* (cause of vitiation of *Dosha*) The main cause of all diseases is provoked *Dosha*. We can use the same methodology to study chronic kidney disease. [9]

Table 1: *Vikara Prakriti*, *Adhishthanantarani* and *Samutthana Vishesha* in Chronic kidney disease (CKD)

S.No	*Lakshana*	*Dosha*	*Dushya*	*Srotasa*
1.	Oedema	*Kapha*	*Rasa, Rakta, Udaka*	*Rasavaha, Udakavaha*
2.	General Weakness	*Vata*	*Rasa*	*Rasavaha*
3.	Loss of Appetite	*Kapha*	*Rasa*	*Rasavaha, Annavaha*
4.	Nausea / Vomiting	*Kapha*	*Rasa*	*Rasavaha, Annavaha*
5.	Muscle Cramps	*Vata*	*Rasa, Rakta, Mamsa*	*Mamsavaha*
6.	Breathlessness	*Kapha*	*Rasa, Rakta*	*Pranavaha, Rasavaha*

In Ayurveda, the kidneys (*Vrukka*) are considered the foundational organs of the *Medovaha Sarotasa*. They primarily develop from the *Rakta* (blood) and *Meda* (fat) *Dhatus*, and are classified as *Matruja* (inherited) *AvaIyava* (organs).

Chronic kidney disease (CKD) is not directly mentioned in Ayurveda, but Ayurvedic concepts can be applied to it through *Nidanapanchaka* (the five-fold diagnostic approach). The signs and symptoms of CKD primarily indicate an imbalance in *Vata* and *Kapha Doshas*, along with disturbances in multiple *Doshas*. Initially, there is vitiation in *Rasa* (plasma), *Rakta* (blood), *Mutra* (urine), and *Udaka* (water), followed by involvement of all *Dhatus* and *Upadhatus* (tissues and sub-tissues). The aggravated *Doshas* and Dhatus circulate through the *Rasa* with *Vyana Vayu*, affecting the *Mutravahasrotasa* (urinary channels), resulting in *Khavaigunya* (dysfunction). The clinical manifestations of *Dosha* disturbance are considered the primary signs of CKD.

Chronic kidney disease (CKD) is a highly complex condition classified as *Vyadhi Sankara.* Its signs and symptoms vary depending on the causative factors and the stage of the disease. The etiological factors contributing to CKD encompass the *Roopavastha*, *Upadrava*, and *Vyadhi Sankara* of the following conditions:

Prameha

In Ayurveda, the term "*Prameha*" refers to a group of disorders characterized by excessive urination (polyuria) and turbid urine. It encompasses conditions such as diabetes mellitus, obesity, and metabolic syndrome. [10] Additionally, certain conditions like nephrotic syndrome are occasionally regarded as variants within this group. [11] The pathogenesis of *Prameha* highlights the localization of vitiated *Doshas* and *Dushyas* in the *Basti*, indicating pathological changes (*Sroto-Vaigunya*) associated with this structure. [12] During this process, *Dosha-Dushya Sammurcchana* (the interaction between vitiated *Doshas* and *Dushyas*) occurs[13], marking the prodromal stage of the disease. A key early symptom related to renal dysfunction is glycosuria[14], observed as urine attracting *Pipilikas* (ants). If the condition advances, it results in the full manifestation of the disease, characterized by increased urine frequency accompanied by turbidity, indicative of polyuria with proteinuria. [15] This stage suggests nephropathy, a late complication of diabetes mellitus. Inadequate or inappropriate management at this stage can render the disease incurable. [16]

Mutraghata

Mutraghata refers to urinary retention accompanied by mild dysuria, caused by an obstruction in the urinary tract. This condition results in either a complete lack of urine excretion or minimal, difficult urination. It arises from the vitiation of *Basti* due to circulating aggravated *Doshas*. [17] Suppression of the urge to urinate in conditions like *Vatabasti*, *Mutratita*, *Mutrajathara*, and *Vatakundalika* leads to urine retention. Direct obstructions such as *Mutragranthi* and *Ashthila* also contribute to urinary retention.

In *Ushnavata*, urinary tract infections cause inflammation, resulting in both retention and dysuria. *Mutrakshaya*, characterized by oliguria due to poor hydration, can impair renal blood flow over time, causing damage to renal cells. *Vidvighata* involves faecal contamination of urine due to rectovesical fistulas. If this contamination ascends to the upper urinary tract, it may lead to infections and renal damage. *Bastikundala* resembles an atonic bladder, leading to urinary retention. In cases of complete obstruction of the urinary tract, symptoms like thirst, delirium, and breathlessness may emerge, resembling uremic syndrome. [18]

Chronic urine retention from these causes leads to urinary stasis, increasing the risk of infections and the formation of urinary calculi, which gradually harm the kidneys.

Probable *Samprapti* of Chronic kidney disease

Complicated urinary system disorders and other systemic diseases result in an imbalance of the three *Doshas* (*Tridosha*). *Acharya Sushruta* describes the process of urine formation as a pitcher immersed in water, where the *Doshas* enter the *Basti* (kidneys) in a similar manner, filling it from all sides. [19] These doshas impair the function of the kidneys. After

digestion, the kidneys separate and differentiate urine as a metabolic by-product for elimination. [20] However, when the kidneys are diseased, they cannot properly differentiate and separate urine, leading to the retention of harmful metabolic waste products in the body, which then circulate and cause systemic harm.[21]

In modern medicine, the pathogenesis of chronic kidney disease (CKD) involves damage to renal cells due to various underlying causes, such as immune complex deposition, inflammation from specific types of glomerular nephritis, or toxin buildup in renal tubules and interstitium. The systemic harm is a result of the accumulation of toxins that would typically be excreted by the kidneys, as well as complications arising from the loss of other renal functions, such as maintaining fluid and electrolyte balance, hormone regulation, and the progressive systemic inflammation that affects the vascular and nutritional systems.

Clinical features of chronic kidney disease

The 2012 Kidney Disease Improving Global Outcomes (KDIGO) CKD classification recommends specifying the cause of CKD and classifies the condition into 6 categories based on GFR (G1 to G5, with G3 split into 3a and 3b). In addition, it also includes staging based on 3 levels of albuminuria (A1, A2, and A3), with each stage of CKD subcategorized according to the urinary albumin-creatinine ratio (ACR; mg/g or mg/mmol) in an early morning "spot" urine sample. [22]

The 6 CKD categories, known as stages 1 through 5, are described below (stage 3 is separated into 3a and 3b):

- G1: GFR 90 mL/min/1.73 m^2 and above with evidence of kidney disease, such as haematuria or proteinuria
- G2: GFR 60 to 89 mL/min/1.73 m^2
- G3a: GFR 45 to 59 mL/min/1.73 m^2
- G3b: GFR 30 to 44 mL/min/1.73 m^2
- G4: GFR 15 to 29 mL/min/1.73 m^2
- G5: GFR less than 15 mL/min/1.73 m^2 or treatment by dialysis

The 3 levels of albuminuria include an ACR:

- A1: ACR less than 30 mg/g (<3.4 mg/mmol)
- A2: ACR 30 to 299 mg/g (3.4-34 mg/mmol)
- A3: ACR greater than 300 mg/g (>34 mg/mmol)

Grades 1 and 2 of chronic kidney disease (CKD) typically do not present with noticeable symptoms related to the decline in glomerular filtration rate (GFR). However, symptoms may arise from the underlying kidney disease or other systemic conditions. As GFR declines to grade 3 or 4, the clinical and laboratory complications of CKD become more apparent. CKD impacts nearly all organ systems, but the most common complications include anaemia, leading to easy fatigue, decreased appetite, and progressive malnutrition. There are also disruptions in calcium, phosphorus, and the regulation of minerals like calcitriol and parathyroid hormone (PTH), as well as abnormalities in sodium, potassium, water balance, and acid-base homeostasis. Since CKD represents a complex syndrome with contributions from various diseases, the signs of renal failure often indicate a reduced life expectancy.

Prognosis

The CRIC study is an observational study that began in 2001 and is still ongoing in the fifth and final phase. The CRIC study examined risk factors for the progression of CKD and CVD among nearly 5500 patients. The study enrolled adults aged 21 to 74 with a broad range of renal disease severity and eGFR between 20 and 70 mL/min/1.73 m^2. About half the patients had concurrent diabetes. Measures of kidney function and occurrence of new and worsening CVD were primary endpoints, and they have yielded valuable data on a variety of other significant associations. [23,24]

The CRIC study showed that CKD progression was correlated with cognitive decline, cardiovascular mortality, left ventricular hypertrophy, coronary artery calcification, and clinical depression, among other associations.[24]

In Ayurveda, understanding the prognosis of a disease differentiating between curable and incurable conditions is essential for an effective physician. Chronic kidney disease (CKD), being a disorder of a vital organ and in an advanced state, is classified based on its stages. In the early stages (stages 1 and 2), it is considered *Krucchrasadhya* (difficult to treat). Stages 3 and 4 are regarded as *Yapya* (manageable with palliation), as significant kidney cell damage and biochemical disturbances occur. At this point, adherence to a strict regimen is crucial to prevent progression. Stage 5, or end-stage renal disease, presents with uremic symptoms and is deemed incurable and beyond mitigation, as it affects all organ systems, leads to widespread destructive effects, and is associated with a poor prognosis and fatal outcomes.[25]

Management

Modern treatment of CKD focuses on addressing its underlying causes. Addressing factors that contribute to the progression of chronic kidney disease (CKD), such as hypertension, proteinuria, metabolic acidosis, and hyperlipidaemia, is essential. Hypertension should be managed according to recommended blood pressure targets, and efforts

should be made to reduce proteinuria to below 1 g/day when possible. [26]

Research has consistently shown that smoking increases the risk of nephrosclerosis, while smoking cessation helps slow CKD progression. [27] Protein restriction has also been found to decelerate disease progression; however, patients with advanced CKD are prone to malnutrition, highlighting the importance of dietary guidance from a nutritionist.

Bicarbonate supplementation to manage chronic metabolic acidosis has been shown to slow CKD progression. [28] Furthermore, in individuals with diabetes, strict glucose control has proven effective in delaying the onset of albuminuria and preventing its progression to overt proteinuria. [29]

Ayurvedic Approach

Primary Goals of Treatment

1. To slow the progression of the disease
2. To address the underlying causes and contributing factors.
3. To manage the complications of the disease
4. To restore lost kidney function

Treatment Protocol

1. ***Nidanaparivarjana:*** Avoidance of causative factors related to diet (*Ahara*) and lifestyle (*Vihara*).
2. ***Lekhana* and *Mutravahasrotasa Rasayana:*** Useful for repairing and enhancing the function of the affected organ.
3. ***Shodhana Karma:*** Supporting the body's excretory functions through detoxification processes.

The main goal of Ayurveda is to promote health in healthy individuals, with the treatment of illness being secondary. Ayurveda provides a holistic approach to the treatment of chronic kidney disease (CKD). The first and most important recommendation is to eliminate the causative factors (*Nidana Parivarjana*). The management of systemic imbalances (*Bheshaja Chikitsa*) focuses on improving *Jathragni* to address *Amotpatti* and remove *Srotorodha*. Treatment can include both *Shamana Chikitsa* (palliative therapy) and *Shodhana Chikitsa* (detoxification therapies).

According to *Acharya Sushruta*, the kidneys (*Vrukka*) are formed from the *Rakta* and *Meda Dhatu*. *Ahara* (food) is converted into *Rasa Dhatu*, which then transforms into the other *Dhatus*, including *Rakta*. Therefore, the treatment should focus on correcting *Jathragni*, which strengthens the *Dhatwagni* (digestive fires), leading to the formation of high-quality *Rasadi Dhatu*. The use of herbal drugs that specifically act on *Rakta* and *Meda Dhatus* is also crucial to nourish the kidneys. After the palliative treatment (*Shamana Chikitsa*) reduces signs of weakness (*Daurbalya*) and tissue depletion (*Dhatu Kshaya*), the patient can be administered gentle purgation (*Mrudu Virechana*) and *Basti* (medicated enemas).

Shamana Chikitsa

Gokshura is *Madhura Rasa*, *Deepana*, *Balya, Basti Vishodhaka, Sheeta Veerya*, *Madhur Vipaka*, *Vrushya* and *Ashmarihara*. *Gokshura*, with its *Madhura Vipaka*, promotes smooth excretion of waste through stool and urine. Its pharmacological properties enhance *Snigdha Guna* and increase *Kleda* (fluid metabolites) in the body. To regulate this excess *Kleda*, the body activates a feedback mechanism that promotes fluid excretion through urine, thereby maintaining homeostasis. The cooling potency (*Sheeta Veerya*) of *Gokshura* supports blood purification (*Rakta Prasadana*). Since the primary function of the kidneys is to maintain homeostasis by filtering blood and regulating electrolyte balance, administering *Gokshura* with its *Sheeta Veerya* helps enhance kidney function. Additionally, as a natural diuretic, it increases urine output, making it beneficial for managing fluid retention-related disorders. [30]

Punarnava, Guduchi, Gokshura, Shatavari, and *Shilajit* are categorized as *Rasayana* drugs in Ayurveda. Notably, *Punarnava, Gokshura,* and *Shilajit* are specifically recommended for disorders of the *Mutravaha Samsthana* (urinary system). These herbs can be regarded as *Naimittika Rasayana* for the kidneys and other components of the *Mutravaha Srotasa*. Their *Rasayana* properties have been demonstrated in clinical studies, where patients reported improvements in digestive fire (*Jatharagni*), better sleep quality and quantity, enhanced well-being, increased functional capacity, and a noticeable reduction in disease symptoms. Modern research supports these claims, highlighting the potent antioxidant and free radical scavenging activities of *Rasayana* drugs. Extensive studies in phytochemistry have further confirmed the significant antioxidant properties and free radical neutralization effects of these herbs. [31]

Shodhana Chikitsa

In the management of CKD, the elimination of circulating vitiated *Dosha* can be effectively achieved through *Virechana* therapy.[32] Additionally, Basti therapy, when combined with appropriate medications addressing the complexities of *Sannipata*, is highly recommended. This therapy offers multiple benefits, including cleansing, pacifying the aggravated *Dosha*, and supporting the patient's longevity. [33] Specific *Basti* formulations such as *Sarakashaadi Niruha Basti*, *Gokshuradi Niruha Basti*, *Pitadaru Siddha Taila Anuvasana*, and *Balarishabhakadi Anuvasana Basti* are particularly prescribed for conditions affecting the *Basti* (urinary system). [34]

Ayurveda highlights the critical importance of *Trimarma-Sira, Hrudaya,* and *Basti*-as essential structures that must be safeguarded to prevent life-threatening consequences. While the *Basti Marma* is anatomically associated with the bladder, it encompasses the entire renal function, with the kidneys playing a pivotal role. Given that *Basti Marma* is impacted in CKD, and recognizing the significance of *Marma* protection (*Marma Paripalana*), *Basti Karma* emerges as a preferred therapeutic approach for managing the condition.

CONCLUSION

Chronic kidney disease (CKD) is the gradual decline of kidney function over months or years. In Ayurveda, it is viewed as an *Upadrava* (complication) of urinary disorders like *Mutraghata* or systemic conditions such as *Prameha* (diabetes). Vitiated *Dosha* affect the *Basti*, disrupting urine filtration and causing harmful metabolic waste retention, leading to systemic damage. Early stages are *Krucchrasadhya* (difficult to treat), while advanced stages are *Yapya* (manageable) or incurable. Management includes purification (*Shodhana*), pacification (*Shamana*), and rejuvenation (*Rasayana*) therapies. *Rasayana* therapy, combined with psychological balance and a lifelong dietary regimen, can slow disease progression, improve kidney function, and enhance quality of life, even in advanced stages.

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