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## Original Research Article

## Prevention and reduce the complications of chronic kidney diseases: A holistic health care approach

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## ABSTRACT

The high incidence of chronic kidney diseases (CKD) and lifelong expensive treatment, diagnosis and dialysis down the acceptance of Ayurveda as holistic care. The incidence of renal diseases is increasing two-fold in Ayurveda hospital in past one decade. The commonest patients are CKD, renal calculus and nephritis. Holistic approach is personalised and treating cause than symptom through diet, Yoga, Panchakarma(detoxification), Herbo-mineral remedies, meditation and modulation/correction of daily lifestyle. Optimum sugar and blood pressure control along with reno protective medicines can prevent the progression of CKD to end stage renal diseases and reduce renal dialysis and replacement therapy. Ayurveda physician should not ignore nephrotoxic plants and heavy metal containing medications. Fifteen single drugs, seven Ayurveda formulations and nephrotoxic Ayurveda herb/compound are described with evidences. In this review, holistic health care approach through Ayurveda medicine, diet Panchakarma, practice of yoga , pranayama , life style modifications to prevent and reduce the complications of chronic renal diseases are discussed with evidences.

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## 1. Introduction

The focus for renal wellness and Reno protective by Ayurveda agents and Panchakarma procedures are triggered due to high incidence of kidney patients, lifelong and expensive treatment in modern system of medicine. The Incidence of Kidney diseases are doubled in last five years in our country. The prevalence is 0.78% in general population of India and the Diabetic kidney disease is highest (41%) and the leading cause of end-stage renal disease. Other etiological factors are hypertension (22%), glomerulus nephritis (16%), ischemic nephropathy (5.4%), drug specially NSAID induced (4.5%), obstructive uropathy (2.7%), miscellaneous (2.7%) and unknown cause (1.4%) constituted the spectrum. The most common causes of renal

parenchymal disease are diabetes and high blood pressure. Besides, medicines, toxin bacteria, viruses, kidney stones, Genetic factors, polycystic kidney disease, autoimmunity are contributed a lot.<sup>1</sup> Patient can not recognise the problem in early stage because of the low sensitivity of creatinine values in the early stages of renal failure, its diagnosis often occurs in the advanced phases of the disease.

There are various mechanisms leading to renal damage such as renal vasoconstriction, vascular endothelial damage, cytokine expression, increase of IL-18, mediating acute tubular necrosis, caspase activity stimulation, p53 up-regulation, accumulation of toxic metabolites, mast cells/neutrophils activation, reactive oxygen species (ROS) generation causing lipid peroxidation that leads to cellular membrane destruction, excessive intracellular DNA breakdown, energy depletion, intracellular Ca<sup>2+</sup> elevation, higher inducible nitric oxide (NO) synthase

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(iNOS) expression, NO deficiency, intra-parenchymal haemorrhage, fibrosis, direct cellular toxicity, tubular obstruction, vascular congestion, activation of angiotensin II axis, mitochondrial dysfunction, cell cycle arrest in G2 phase, ATPase activity inhibition, and cellular transport modification.<sup>2</sup>

The clinical signs and symptoms of kidney disease are often nonspecific, meaning it can also be appeared by some other illnesses. Kidneys are highly adaptable organ in the body and able to compensate for its lost function. The signs and symptoms may appear at the stage of irreversible damage, which include nausea, vomiting, loss of appetite, fatigue & weakness, sleep problems, changes in urine output, decreased mental sharpness, muscle twitches & cramps, hiccups, swelling of feet & ankles, persistent itching, shortness of breath, high blood pressure (hypertension) etc. Often, it is diagnosed as a result of screening of people known to be at risk of kidney problems, such as those with high blood pressure or diabetes and those with a blood relative with renal disorders. It is considered as long term form of kidney disease and is differentiated from acute kidney disease in that the reduction in kidney function must be present for over three months. Kidney diseases are identified by blood test for creatinine, which is a breakdown product of muscle metabolism. Higher level of creatinine indicate a lower glomerular filtration rate and as a result a decreased capability of the kidneys to excrete waste products. The modern management of CKD is not satisfactory and the ultimate goal is renal transplant. It seeks attention from nephrologists and researchers to find out suitable remedial measure from other alternative resources, Ayurveda is one of them.<sup>3</sup>

Although Renal diseases are generally progressive and irreversible, there are Ayurveda medications that patients can take to slow progression, enabling patients to live longer without complications or no need for renal replacement therapy. The notion of renal well ness and reno-protection are developing into a combined approach to renal diseases, the main measures being pharmacological control of blood pressure and reduction of proteinuria. Lowering of blood lipids, smoking cessation, and tight glucose control for diabetes also form part of the multimodal protocol for management of renal patients. With available treatments, dialysis can be postponed for many patients with chronic nephropathies, but the real goal of Ayurveda has to be avoiding dialysis which is in other words remission of disease and regression of structural damage to the kidney.<sup>4</sup>

Current conventional-medicine treatment options for chronic kidney disease (CKD) are limited in efficacy, and often do not inhibit progression of CKD to end-stage kidney disease (ESKD), an increasing and costly medication. As a result of dissatisfaction with conventional therapy, patients with CKD, even those receiving regular haemodialysis, may choose a second, or adjunct, treatment option for a variety

of reasons including averting CKD progression, resolving concomitant problems such as pruritus, fatigue, depression, anxiety, uremic bruising, and preventing cardiovascular complications.<sup>5</sup>

Although Holistic health care (hhc) approach is very old phenomena described in Ayurveda and other traditional system of medicine around the globe. Holistic health care is a complex approach treat the root cause of diseases rather than just symptom by addressing patients' physical, emotional, social and spiritual needs, restores their balances and enables them to deal with their illnesses, consequently improving their lives. Holistic approach in CKD in modern system of medicine already presumed for integrated health care.<sup>6</sup> Ayurveda is the complete holistic system of medicine as it comprising diet, Yoga, massage, Panchakarma(detoxification), herbo - mineral remedies, meditation and daily lifestyle based on Prakruti (psycho-somatic constitution). So, the treatment design is personalised and specific.<sup>7</sup>

## 2. Ayurveda & Kidney Disorders

Although Ayurveda narrated before 5000Bc, still the narration of Vasti (urinary Bladder), Vrikka(Kidney),Gavini (ureter),Mutra Parseka (Urethra) etc were found in Ayurveda literature. The formation of urine mechanism in Ayurveda is different from present understanding of modern physiology. Urine is formed from Ahara rasa ( processed food) after the division of Sara( Essential for body) and Kitta (Waste) . The liquid part of Kitta ( waste) is separated from solid part Purisha (Stoll ) in Pakshyasaya(Large Intestine) and transported through mutravaha dhamani ( Urine transporting channels) to Vasti ( Bladder). The formation of Kidney diseases are explained in Ayurveda and under Mutra vaha sroto dushti and the diseases like mutraghata, mutrakrcchra, ashmari, ushna vata, soma roga, udavarta, Asthila and prameha can be considered. According to Ayurveda, kidney disease is caused by the blockage of minute channels related urinary system i.e mutravaha srotas, carry urine and are responsible for the flow of liquid into and out of the kidneys. If there are blockages in the incoming srotas the kidneys are denied fluids and shrinkage occurs and kidney diseases manifested. Ayurveda defines kidneys as fat tissue channels and believes that they are made of rakta (blood) and meda (fat tissue) dhatus and to cure kidney diseases, one physician must balance these two by prescribing meda kapha hara drugs.<sup>8</sup>

The etiological factors for Renal disorders described in Ayurveda are Mutra vega dharana( Suppression of urine urge), Ativyayama(Excessive exercise), Anupa mamsa ( Excessive eating of fish and fish products),Teekna ausadha ( high potency medication), Tikna madya( excessive use of concentrated alcohol), Druta Pratyayana(long time sitting and moving in high spread vehicle), Ksheena purusha (

Emaciated person or immune compromised ) and abhighata ( Injury to the *mutra baha srotos* ). The symptoms of Renal disorders are Chardi (vomiting), Shotha (Periorbital, Pedal, whole body swelling), Shirashoola (Headache), Jvara (Fever), Raktahrasa (Anemia), Panduvarnatwak (Uremic Tinge), Swedabhava (Reduced sweating), Twacha Roukshya (Uremic Frost), Agnimandhya (Loss of Appetite), Peeda Kattayam (Pain in Low back), Udara Peeda (Pain abdomen), Vrukkadesha Peeda (Pain in Renal angle), Nadi nyuna (Feeble pulse), Nadi Vegata (High tension pulse), Bindurupa Mutra (Scanty urine), Peedayukta and Ushna Mutra (Painful and burning Micturition).<sup>9</sup>

The incidence of renal diseases has been increasing in Ayurveda hospital in past one decade. The commonest patients are CKD, renal calculus and nephritis.

### 3. Ayurveda based Reno medications

Medicinal plants, metals and minerals has been utilised for prevention and cure of renal diseases in Ayurveda since centuries. Ayurveda medications are regarded as an acceptable, cheap, easily available and relatively safe source of many active compounds for pharmaceuticals. It is not limited to only oral medication but diet control, exercise and Panchakarma therapy are other modalities of treatment. Different types of phytochemicals such as flavonoids, vitamins, resveratrol, anthocyanin, curcumin and phenolic acid are often found in the plant-based medicines and may act as antioxidant. Panchakarma has very limited basic research, still Panchakarma can helpful in resistance Reno vascular hypertension and promoting creatinine clearance.<sup>10,11</sup> Panchakarma increase vacuolisation of whole body, relaxation of peripheral vessels, regulate endothelial dysfunction and decrease proinflammatory cytokines, which help auto healing process.<sup>12</sup> There is a significant benefits of Ayurveda medications and Panchakarma for renal disorders and promotion of Ayurveda for Chronic Renal diseases are necessary. Evidences indicated that traditional medication can Chinese Herbal Medicine Improves the Long-Term Survival Rate of Patients with Chronic Kidney Diseases. Ayurveda medication is very useful in CKD.<sup>13,14</sup> Panchakarma can helpful in resistance Reno vascular hypertension. The Renal well ness and reno protective drugs that are used for *Mutravaha srotas* ailments, they can be grouped as *Mutrasangrahaneeeya dravyas*, *Mutravirajaneeya dravyas*, *Mutravirechaneeya dravyas*, *Ashmarighna dravyas*, *Pramehagna dravyas* in Ayurveda.<sup>15</sup> The reno proactive drugs and mechanism of action narrated in Table 1. Similarly compounds Ayurveda formulations used in clinical practice are presented in Table 2. Ayurvedic physician should always caution about the nephrotoxicity Ayurveda compound to prevent CKD (Table 3)

### 4. Diet and CKD

Ahara (diet schedule) and *virudhha ahara* (incompatible diet) are very much responsible for genesis and progression of Kidney disorders. More intake of *Jangala* and *anupa mamsa* ( chicken, red meat and fish), *dugdha vikara* ( milk product) can change the morphology and haemodynamic of kidney and induce chronic renal failure. Therefore, low protein diet (0.8gm/kg/body wt) to very low protein diet (0.28-0.43gram/kg/body wt) along with essential amino acid supplement is recommended for ameliorated kidney function which was decline over time and reduced /prolong the need for renal replacement therapy. Ayurveda always advised for Plant based protein diet which is ingested along with fiber, phytonutrients, and antioxidants which reduce blood pressure and CKD. It was observed that strict monitoring of protein intake, calcium, phosphorous, potassium and sodium can slow down the progression of kidney disorders.<sup>25</sup>

### 5. Panchakarma and CKD

Panchakarma therapy has a definite role in CKD which is less emphasised by Ayurveda physicians. *Vata* is deranged in *Pakshysaya* (large intestine) as well as *Sakha* (whole skin). There is a persistence of Hypertension and resistance hypertension in most of the cases of CKD. The clinical practice experiences evident that *Abhyanga* (Body massage), *sarbang swedana* (Sudation Therapy), *sarbanga patra-potali-swedana* , *Shalishastika pinda swedana* have modulate the self-recovery mechanism and reduce blood pressure , serum creatinine and BUN in chronic kidney diseases patients. *Punnavadi kasya vasti* and *Goshura punnava vasti* have clinical evidence of reduce micro albumin and improve creatinine clearance.<sup>26</sup>

### 6. Practice of Yoga, Pranayama and Dhyana

CKD patients are always associated with hypertension, diabetics, fear of dialysis and renal transplant and death. Diet restriction and isolation is always hamper quality of life. Six months yoga program is safe and effective measure as adjuvant therapy to conventional treatment modalities in reducing blood pressure, improving renal function, decreasing the need for dialysis, and improving QOL in patients with CKD.<sup>27</sup>

### 7. Modulation of Life style

There is a graded causal relationship between central (waist circumference) and general obesity and CKD incidence; a retrospective cohort study observed a significant relationship between high body mass index (BMI) starting from 25.0 kg/m<sup>2</sup> and the risk of end-stage renal disease. *Nidra* (Sleep) and work pressure, stress has significant role in genesis of kidney disorders. Sexual activity ( *Maithuna* )

**Table 1:** Ayurveda based reno protective medical plant and pharmacological actions<sup>16</sup>

SN	Plant name	Parts used	Mechanism of action
1	Aswath Ficus religiosa	Latex	Increased malondialdehyde and renal proactive
2	Punarnava Boerhaavia diffusa	Root	Prevented acetaminophen induced nephrotoxicity in rats
3	Varuna Crataeva nurvala	Root bark	ameliorated the deleterious effects of renal I/R by mainly counteracting oxidative stress and presumably inflammation.
4.	Vacha Acarus calamus	Root	Increased creatinine clearance
5.	Gokshur Tribulus terrestris	Fruit	Antioxidant , maintain renal function and reduce renal injuries.
6.	Haldi Corcuma longa	Rhizome	
7	Chadeigudi Vitex peduncularis	Leaf	Anti inflammatory and anti bacterial in UTI
8	Billva Aegle marmelus	Leaf extract	Significant reduction of urea, BUN and creatinine
9	Sunthi Zingiber officinalis	Rhizome	Prevent from glomerular mesangial matrix deposits and protected nephron
10	Satavari Asparagous recemosa	Rhizome	Decrease creatinine, renal hypertrophy, polyuria, microalbumin in mice
11	Dadima Punica granatum	Peel extract	Decrease of BUN, serum protein and serum creatinine in Rat model
12	Kataka Strychnos potatorum	Seed	Normalise BUN, serum protein and serum creatinine in Rat model
13	Lajjalu Mimosa pudica	Leave extract	Diuretics and increase electrolyte excretion in rat
14	Duralabha Tragia involucrata	Whole plant	Anti bacterial, anti diabetic and diuretics in rats
14	Yarsagumpa Cordyceps sinensis	Whole	its polysaccharides can regulate the balance of pro- and anti-inflammatory cytokines secreted by macrophages to normalize the immunity ,used all kidney diseases
15	Shilajatu	Purified	Not significant result in creatinine clarence in clinical trial <sup>17</sup>

**Table 2:** Ayurveda formulations used inChronic kidney diseases

S.N	Ayurveda formulation	Mechanism of action	Cl inical evidences
1.	Punnavadi kasaya	Reduce creatine and BUN	One trial <sup>17</sup>
2.	Varunadi Kasaya	Reduce creatine and BUN	Clinical trial
3.	Goshuradi gugulu	Reduce creatine and BUN	Clinical trial <sup>18</sup>
4.	Sarbotrabhadra vati	Reduce creatine and BUN	In use, but no trial report
5	Chadraprava vati	Reduce creatine and BUN	Case study
6	Punnavadi Madura	Reduce creatine and BUN	Case study <sup>19</sup>
7	Neeri KFT	Anti-inflammatory and anti-oxidant	More evidence in trials and systemic review <sup>20</sup>
8.	Shilajatyadi Lauha	Reno protective in practice	
9	Siddha Makardwaja	Immuno modulation	Case study in Lupus nephritis <sup>21</sup>

**Table 3:** Reported nephro-toxicity Ayurveda medication<sup>22,23</sup>

S.N	Name herb/ formulation	Nephrotoxicity report
1	Madayantika <i>Lowsonia inermis</i>	Leaf has Nephrotoxicity
2.	Arogbodha <i>Cassia angustifolia</i>	Loss of fluid and electrolyte , tubular necrosis
3	Saptaparna <i>Alstonia scholaris</i>	Leaf has nephrotoxic effect
4.	Kumari <i>Aleo vera</i>	Hypo kalamia and acute renal failure
5	Jastimadhu <i>Glycyrrhiza glabra</i>	Hypo kalamia , tubular necrosis
6	Rasa ausadhi Heavy metal containing formulation	Always nephrotoxic but safe in judicial use <sup>24</sup>

has direct relationship with progression of CKD. But Sukra kshyaya is presumed to be in genesis of early CKD. So daily exercise and modification of life style is recommended for CKD patients<sup>28</sup>

### 8. Practice of Asana (Yogic posture , Pranayam) Breathing exercise and Dhyana( Meditation)

The CKD can well maintain and can be remission, if proper medication by Ayurveda specialist.

#### A. Tips for Renal wellness

1. Control your blood pressure and blood sugar.
2. Take regular sodhan from Ayurveda expert whose are high risk Kidney patient.
3. Practice Yoga and meditation regularly to get down over weight.
4. Drink Lemon water to hydrated kidney and can reduce stones
5. Take less salt and saturated fat
6. Take good water(iron, arsenic free) for drinking and cooking purpose.
7. Take organic fruits, vegetables and grains
8. Avoid fertilisers and pesticides in your kitchen garden
9. Treat chronic UTI and practice safe sex life.

#### B. Tips for Reno protection in CKD

1. Take proper medication for hypertension and diabetics
2. Correction of anaemia by Ayurveda medication
3. Ayurveda calcium supplements as per doctor advices
4. Reduce salt and water intake
5. Reduce protein intake
6. Use Ayurveda medication if any swellings in feet or face as per Ayurveda physician
7. Monitor Potassium and phosphate quarterly along with haemoglobin, urea and creatinine in blood
8. Hyperkalamia is life threatening, so do not use green vegetable in your diet
9. Use corydeceps for reno protection with consulting Ayurveda expert
10. Be active and fit always and practice yoga and meditation
11. Practice yoga, pranayama and ask for suitable Sodhana to Ayurveda expert
12. Ask for medication with Reno protective Ayurveda drugs

### 9. Discussion

The prevalence of CKD patients is more in Ayurveda teaching hospitals and research centres. The clinical evidence of hypertension induced CKD and diabetic induced CKD in large sample size made more confident to the ayurveda physician. Previously we thought that mammals have limited capacity of regeneration of nephron, so kidney function cannot be restored in CKD. My experience proved that kidney function can be reversible and regeneration of nephrons can possible through Ayurveda treatment. Mercurian compound and gold containing medicine are not always nephrotoxic, but heavy metal contains Ayurveda preparation should be used with caution. The present treatment option dialysis may compensate the renal function , but risk of thrombosis and infection , so dialysis does not ensure long term survival.<sup>29</sup> Plant based low protein diet, practice of yoga, pranayama, life style modifications and panchakarma can reduce blood pressure and ameliorated kidney function which was decline over time.

### 10. Conclusion

Ayurveda can be the best way for renal well ness and reno protection in chronic kidney diseases. Ayurveda medications, Plant based low protein diet and panchakarma can prevent reduce the complications of CKD through reduction of blood pressure and ameliorated kidney function which was decline over time and reduced /prolong the need for dialysis and renal replacement therapy.

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None.

### 12. Conflict of Interest


None.

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