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EXPLORING AYURVEDIC INTERVENTIONS IN CHRONIC KIDNEY DISEASE WITH HYPERTENSION: A CASE REPORT

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ABSTRACT

Chronic kidney disease (CKD) is a global health issue, predominantly caused by hypertension, which account for 80-85% of cases. CKD is categorized into five stages based on glomerular filtration rate (GFR), for its effective management a multidisciplinary approach that includes nutritional therapy is needed.As it is a slow progressing condition and to reduce the risks for cardiovascular risks accompanied by this, regular monitoring must be done. Regardless ofthe advances in the management of CKD, underprivileged population still face challenges in early detection and intervention to carry on. This case report focuses on a 42-year-old malepatient with CKD since 2 years and diagnosed with Hypertension since 10 yearswho received Ayurvedic treatment at Jeena Sikho Lifecare Limited Hospital, Derabassi. A treatment comprising a blend of Panchakarma therapies and personalizedAyurvedic formulations is administered, resulting noticeable improvements in his symptoms, kidney function and overall well-being. After treatment, the patient showed considerable enhancements in GFR and reported relief from constipation and other symptoms. The serum urea and creatinine were also considerably regulated. This study results emphasis Ayurveda comparing to conventional treatment method as a potential cost effective therapy. These results highlight that Ayurveda can be cost-effective alternative for individuals who do not have access to advanced conventional healthcare. Even though the findings from this studies are promising, further studies including larger randomized controlled trails is much needed to evaluate the efficiency and safety of these Ayurvedic interventions for CKD to standardize treatment protocols. Integrating the principles of Ayurveda with contemporary medical practices may provide a consolidated approach for the management of CKD, emphasizing the total well-being of the patient.

KeywordsChronic Kidney Disease (CKD), Glomerular Filtration Rate, Mutravaha strotas vikar, Ayurvedic therapies, Hypertension

Introduction

Heterogeneous abnormalities and malfunctions affecting the structure and function of kidney are generally termed as Chronic Kidney Diseases (CKD). CKD is classified into five stages on the basis of GFR: Stage 1: more than 90 mL/min per 1·73 m^2, Stage 2: 60–89 mL/min per 1·73 m^2, Stage 3: 30–59 mL/min per 1·73 m^2, Stage 4: 15–29 mL/min per1·73 m^2, and stage 5: less than 15 mL/min per 1·73 m^2. CKD is associated with hypertension, diabetes, obesity, old age and

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cardiovascular diseases in developed countries[1]. There are many causative diseases well studied for CKD including cystic kidney diseases, glomerulonephritis, diabetes etc., but the exact cause is still unknown. There is a close relation between CKD and hypertension which is not well disclosed whether it is a causative or consequence of CKD. Even though the loss of kidney function rate differs by exposures, interventions and etiology, the progression of CKD in most cases will take several months or decades. Typically, the signs of CKD come with increase in blood urea, low pH in blood, expansion of the extracellular fluid volume, anemia, electrolyte imbalance, mineral and bone issues, general weakness and left untreated may ultimately cause death[2]. Along with hypertension, anemia is also prevalent in the patients with CKD. Erythrocyte deficiency along with folic acid, iron and vitamin B12 is also identified[3]. Constipation characterized by decreased intestinal motility is also common in CKD patients[4].

Approximately 850 million people are affected with kidney diseases who live in low income and low middle income countries lacking access to the diagnosis and treatment [5]. In the current scenario kidney disease is the third fastest growing cause of global mortality and the only non-communicable disease showing constant rise in age adjusted mortality [6]. The conventional treatment methods for CKD includes, weight loss in the case of overweight and engage in regular exercise, quit smoking, reduce the amount of salt in the diet, consume a healthy and balanced diet and drink around two liters of fluids per day (approximately 10 cups or 6 mugs). However, if eGFR is less than 15ml/min, it is advised to avoid excessive fluid intake.

In India, the occurrence of CKD is due to unhealthy diet, uncontrolled diabetes, lifestyle and hypertension. Kidney is one of the sources of fat flow in body [7] and derived from blood along with the fats [8].Case Studies demonstrates that naturopathy reduced creatinine levels and improved kidney function in a CKD patient through dietary changes and yoga practices [9]. Including naturopathy is considered as a favorable treatment method for improving renal function and reducing symptoms in CKD patients[10]. Researches indicates that various herbal medicines exhibit anti-inflammatory and antioxidant properties beneficial for CKD management [11]. The integration of herbal and conventional therapies is common nowadays to enhance treatment outcomes for CKD [12].

Ayurveda is now widely used as a treatment method for CKD. Ayurveda focus on the significance of personalized treatment for each patient according to their constitution and imbalances in the body[13]. This traditional system of medicine correlates CKD with concepts such as *mutravah srotas vikar* and *Vataj pandu*, focusing on restoring balance and improving kidney function through herbal formulations and lifestyle modifications[14,15]. CKD is not clearly mentioned in any basic ancient Ayurvedic texts but can be understood by connecting to *Vataj pandu*, which shares symptoms and causes with CKD[15]. Ayurvedic principles prefers to understand the *Dosha, Dushya* and *Srotas* involved in CKD, allowing for personalized treatment strategies[16].

Accentuating physical and emotional wellbeing of the patient an integrated method with Ayurveda therapies is provided for treating CKD. Ayurvedic practices focus on enhancing kidney function and overall health while naturopathy accompanies natural healing methods. Modifications of lifestyle plays and important role in managing CKD which equally signifies stress management and physical activity. This case reportshows significant improvements in a CKD patient with hypertension, and reductions in serum creatinine and blood urea levels after therapy.

CASE REPORT

A 42-year-old male with a history ofCKD since 1 month along with hypertension for the past 8 years, visited Jeena Sikho Lifecare Private Limited Hospital in Derabassi (Chandigarh) on September 19, 2022. He reported symptoms of frothy urination, constipation and general weakness. He also experienced hemoptysis a month prior to the visit. The patient had undergone a bilateral hydrocele operation before 10 years and was taking allopathic medicines regularly. His constitution was identified as *Pitta-Kapha Prakruti*. He was hypertensive, non-diabetic and had no history of coronary artery disease (CAD) or thyroid disorders, but had a family history of hypertension. He was of average nutritional status, had a constipated bowel, normal bladder function and normal sleep and appetite. A thorough Ayurvedic evaluation was conducted, which included a detailed medical history, physical examination and diagnostic tests.

The findings were observed during the initial examination of the patient on the first dayas mentioned in **Table 1**.

Table 1 Vitals during the initial examination

Parameter	Findings
Blood Pressure	150/100 mm of Hg
Pulse Rate	85/min
Weight	71.8 Kg
Nadi	Pitta-Kaphaj
Mala	Vibandha
Mutra	Phenila Mutra
Jivha	Avikruta
Shabda	Spashta
Akriti	Madhyama
Drik	Avikruta

During his IPD stay, the patient received comprehensive Ayurvedic treatments, including Panchakarma therapy. This therapy encompassed Awagaha Swedan, Gokshuradi Siddha

Sneha Basti (90ml), Snehan, Shiro Pichu and Head downtilt (HDT) therapy. The patient was advised to take Yakrit Shoth Har Vati along with Kidney care syrup2 days, ChanderVati tablet 2 BD for 5 days with Trivrit avleha for ½ a teaspoon HS.

After seven days of treatment, the patient experienced significant improvement, including relief from constipation, general weakness and frothy urination. Vitals observed during the treatment Investigations conducted on the September19, 2022, are detailed in **Table 2**. The medications taken during IPD are listed in **Table 3**. Investigations conducted on September19, 2022, on the day of admit are detailed in **Table 4**. Daily vitals observed during the IPD treatment, Investigations are detailed in **Table 5.** Gokshuradi Siddha Sneha Basti and Shiro Pichu therapies were administered from September 20, 2022, to September 24, 2022. On September 25, 2022, in addition to Gokshuradi Siddha Sneha Basti and Shiro Pichu, Snehan was also performed. Awagaha Swedanand HDT were also administered daily during the IPD. The patient was subsequently discharged on September26, 2022. The vitals before discharge, September 25, 2022 are mentioned in **Table 4.**Medicine given at the time of Discharge is given in **Table 6**.

Table 2 Vitals observed during the IP treatment Investigations

Parameter	Findings
Date	19/09/2022
Hemoglobin	10.8 gm/dL
Lipid Profile	
Total Cholesterol	141.2 mg/dL
HDL	39.2 mg/dL
LDL	74.7 mg/dL
VLDL	27.3 mg/dL
Cholesterol/HDL Ratio	3.60 (within normal range)
Triglycerides	136.5 mg/dL
Rapid Tests	Non-reactive for HIV, HBsAg, and HCV
eGFR	25 ml/min/1.73m²

The patient returned for a follow-up on December 30, 2022, 3months' post-discharge, presenting with complaint of general weakness.DTPA scan of the patient done on December 30, 2022, shows poor visualization and relative perfusion in both kidneys, shrunk in size.The cortical margin delineation was poorly defined for both the kidneys, i.e. the cortical function was severely compromised. GFR by left kidney was 9.352 ml/min and right kidney was 8.806 ml/min, whereas the global GFR was 18.2 ml/min/1.76 sq m BSA. Vitals during the the follow up are mentioned in **Table 4**. Medications advised on the follow up visit is mentioned in **Table 9**

The patient returned for a follow-up visit after 1 year and 5 months on May 10, 2024. He presented clear bowel, good appetite, clear urine and good sleep. The investigation revealed that hemoglobin level as low with low RBC count and PCV/HCT. Blood urea was a little high, with additional results detailed in **Table 4**. The prescribed Ayurvedic medications are described in **Table 10**.

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The patient adhered to a meticulously designed Disciplined and Intelligent Person(DIP) Diet to complement the Ayurvedic treatments for CKD[17,18].

Treatment Plan

I. Diet Plan:

The dietary guidelines provided by Jeena Sikho Lifecare Private Limited Hospital in Derabassi (Chandigarh)include the following key recommendations:

a. Foods to Avoid:

- Do not consume wheat, Rice, Packed food,refined food, dairy, or animal products, tea and coffee.
- Avoid eating after 8 PM.

b. Hydration:

- Boil 2 litres of water to reduce it to half (1 litre) and consume.
- When thirsty, take small sips of water, ensuring only a limited amount is consumed at each time.

c. Millet Intake:

- Incorporate five types of millet into your diet: Foxtail, Barnyard, Little, Kodo and Browntop.
- Don't mix millets.
- Prepare millets exclusively using steel cookware.
- Utilize only mustard oil for cooking.

d. Meal Timing and Structure:

1. Early Morning (5:45 AM): Herbal tea with raw ginger and turmeric
2. Breakfast (8:30-9:30 AM): The patient will have 600 grams of steamed fruits according to the season.
3. Morning Snacks (11:00-11:20 AM): The patient will be offered100g ofsproutsalong with 150 ml red juice and 4-5 soaked almonds and raisins.
4. Lunch (01.00 PM - 2:30 PM): The patient will receive Plate 1 and Plate 2. Plate 1 will include a steamed vegetable salad, while Plate 2 will consist of a cooked millet-based dish (Millet salad, Millet khichdi or Millet chapatti) with raw ginger and turmeric. Alkaline water is provided along with the diet.
5. Evening Snacks: Green juice (100-150 ml) accompanied by Roasted makhana.

Table 3 Medications taken during the IPD

Medicine name	Ingredients	Dosage	Therapeutic Effects
Chander Vati Tablet	Kapoor Kachri (Hedychium spicatum), Vacha (Acorus calamus), Motha (Cyperus rotundus), Kalmegh (Andrographis paniculata), Giloy (Tinospora cordifolia), Devdaru (Cedrus deodara), Desi Haldi (Curcuma longa), Atees (Aconitum heterophyllum), Daru Haldi (Berberis aristata), Pipla Mool (Piper longum root), Chitraka (Plumbago zeylanica), Dhaniya (Coriandrum sativum), Harad (Terminalia chebula), Bahera (Terminalia bellirica), Amla (Phyllanthus emblica), Chavya (Piper chaba), Vayavidang (Embelia ribes), Pippal (Piper longum), Kalimirch (Piper nigrum), Sonth (Zingiber officinale dried ginger), Gaj Pipal (Scindapsus officinalis), Swarn Makshik Bhasma, Sujji Kshar, Senda Namak, Kala Namak, Choti Llayachi (Elettaria cardamomum), Dalchini (Cinnamomum verum), Tejpatra (Cinnamomum tamala), Danti (Baliospermum montanum), Nishothra (Operculina turpethum), Banslochan, Loh Bhasam, Shilajit (Asphaltum punjabinum), Guggal (Commiphora wightii).	2 tablets BD (Adhobhakta with koshna jala)	Alleviates urinary tract symptoms and promotes healthy urine flow.
JS BP cure	Sarpgandha (Rauvolfia serpentina), Arjuna (Terminalia arjuna), Shigru (Moringa oleifera), Haritaki (Terminalia chebula), Vibhitaki (Terminalia bellirica), Amla (Emblica officinalis), Godanti Bhasma (Gypsum).	2 capsules BD (Adhobhakta with koshna jala)	Maintain a healthy heart functioning, kidney function
Kidney Care Syrup	Punarnavarishtha, Chandanasava, Ushirasava, and Gokshuradi Kadha	2 tablespoon BD (Adhobhakta with samamatrakoshna jala)	Supports kidney function, addressing swelling and pain.
Trivrit avleh	Sita (Saccharum officinarum), Madhu (Honey), Trivrit (Merremia turpethum), Ela (Elettaria cademomum), Twak (Cinnamomum verum), and Patra (Cinnamomum tamala)	Half a teaspoon HS (Nishikal with koshna jala)	Cure abdominal distension and constipation
Yakrit Shoth Har Vati	Punarnava (Boerhavia diffusa), Kalimirch (Piper nigrum), Pippali (Piper longum), Vayavidanga (Embelia ribes), Devdaru (Cedrus deodara), Kutha Haldi (Picrorhiza kurroa), Chitrake (Plumbago zeylanica), Herad Bahera (Terminalia chebula, Terminalia bellirica), Amla (Emblica officinalis), Danti (Baliospermum montanum), Chavya (Piper chaba), Indra Jon (Taraxacum officinale), Pippla Mool (Piper longum), Motha Kalajira (Nigella sativa), Kayphal (Myrica esculenta), Kutki (Picrorhiza kurroa), Nisoth (Operculina turpethum), Sonth (Zingiber officinale), Kakd Singhi (Cucumis sativus), Ajwaen (Trachyspermum ammi), Mandur Bhasma (Ferrum).	2 tablets BD (Adhobhakta with koshna jala)	Helps in better liver function ,Strengthen digestion process and Helps in Detoxification

Table 4. Vitals of follow up treatments

Parameter	Findings			
Date	19/09/2022	25/09/2022	30/12/2022	10/05/2024
Hemoglobin	10.8 gm/dL	11.1 gm/dL	11.7 gm/dL	10.9 gm/dL
Urea	62.9 mg/dL	60 mg/dL	50.6 mg/dL	47.98 mg/dL
Creatinine	3.1 mg/dL	3.7 mg/dL	1.80 mg/dL	1.52 mg/dL
Uric acid	5.2 mg/dL	5.5 mg/dL	1.7 mg/dL	6.72 mg/dL
Sodium	140.1 mEq/L	142.2 mEq/L	140.4 mEq/L	140.3 mEq/L
Potassium	4.54 mEq/L	4.58 mEq/L	4.61 mEq/L	4.63 mEq/L
Chloride	100.3 mEq/L	101.9 mEq/L	106.4 mEq/L	102.3 mEq/L
Urine protein	Present	-	-	Absent
Urine glucose	Absent	-	-	Absent
Pus cells	1 to 2	-	-	1 to 2
Epithelial cells	2 to 3	-	-	2 to 3
PCV/HCT	32.10%	32.10%	30.40%	34.40%
Total RBC count	3.96 Mill/Cumm	3.98 Mill/Cumm	3.89 Mill/Cumm	3.29 Mill/Cumm
MCV	81.1 fl	80.6 fl	78 fl	104.5 fl
MCH	27.3 pg	27.8 pg	30 pg	33.1 pg
MCHC	33.70%	34.50%	38.50%	31.60%
Total protein	9.4 g/dL	-	8.40 g/dL	7.27 g/dL
Globulin	4.35 g/dL	-	4.07 g/dL	3.17 g/dL

Table 5. Vitals during the daily IPD

Date	Time	Weight in Kg	Temperaturein	Pulse/ min	Respiration rate/min	SpO2	BP (mmHg)
20/09/2022	11:00 AM	71.7 Kg	98.6	85	20	98%	130/90
21/09/2022	11:00 AM	71.1 Kg	98.2	85	20	98%	110/80
22/09/2022	11:00 AM	71.7 Kg	98.4	80	18	99%	150/90
23/09/2022	11:00 AM	70.7 Kg	98.2	95	18	98%	150/90
24/09/2022	12:00 PM	69.1 Kg	98.4	90	20	98%	160/100
25/09/2022	10:00 AM	70.2 Kg	98.4	67	18	99%	160/100
26/09/2022	10:00 AM	70.6 Kg	98.2	78	20	99%	150/90

Table 6. Medicine given at the time of Discharge

Medicine Name	Ingredients	Dosage	Therapeutic Effects
CKD Syrup	Kasani (Cichorium intybus), Gokhru (Tribulus terrestris), Shatavari (Asparagus racemosus), Giloy (Tinospora cordifolia), Sorbitol, and Shudh Shilajit (Asphaltum punjabianum)	20 ml BD (Adhobhakta with samamatra koshna jala)	Provides relief from pain and discomfort associated with kidney issues.

Divya Shakti Powder	Trikatu, Triphala, Nagarmotha (Cyperus rotundus), Vay Vidang (Embelia ribes), Chhoti Elaichi (Elettaria cardamomum), Tej Patta (Cinnamomum tamala), Laung (Syzygium aromaticum), Nishoth (Operculina turpethum), Sendha Namak , Dhaniya (Coriandrum sativum), Pipla Mool (Piper longum root), Jeera (Cuminum cyminum), Nagkesar (Mesua ferrea), Amarvati (Achyranthes aspera), Anardana (Punica granatum), Badi Elaichi (Amomum subulatum), Hing (Ferula assafoetida), Kachnar (Bauhinia variegata), Ajmod (Trachyspermum ammi), Sazzikhar, Pushkarmool (Inula racemosa), Mishri (Saccharum officinarum).	Half a teaspoon HS (Nishikal with koshna jala)	Enhances overall vitality and energy levels, addressing fatigue and weakness.
JS BP cure	Sarpgandha (Rauvolfia serpentina), Arjuna (Terminalia arjuna), Shigru (Moringa oleifera), Haritaki (Terminalia chebula), Vibhitaki (Terminalia bellirica), Amla (Emblica officinalis), Godanti Bhasma (Gypsum).	2 capsules BD (Adhobhakta with koshna jala)	Maintain a healthy heart functioning, kidney function, and improve digestive health
Nephron plus	Hazrool yahood (Lapis judaicus) bhasma, Chandraprabha powder and pashanbheda (Bergenia ligulata)	2 capsules BD (Adhobhakta with koshna jala)	Beneficial to kidney diseases and urinary problems
Yakrit Shoth Har Vati	Punarnava (Boerhavia diffusa), Kalimirch (Piper nigrum), Pippali (Piper longum), Vayavidanga (Embelia ribes), Devdaru (Cedrus deodara), Kutha Haldi (Picrorhiza kurroa), Chitrake (Plumbago zeylanica), Herad Bahera (Terminalia chebula, Terminalia bellirica), Amla (Emblica officinalis), Danti (Baliospermum montanum), Chavya (Piper chaba), Indra Jon (Taraxacum officinale), Pippla Mool (Piper longum), Motha Kalajira (Nigella sativa), Kayphal (Myrica esculenta), Kutki (Picrorhiza kurroa), Nisoth (Operculina turpethum), Sonth (Zingiber officinale), Kakd Singhi (Cucumis sativus), Ajwaen (Trachyspermum ammi), Mandur Bhasma (Ferrum).	2 tablets BD (Adhobhakta with koshna jala)	Helps in better liver function ,Strengthen digestion process and Helps in Detoxification

One month prior to the visit, the patient has checked his vitals on August 18, 2022 and medications taken during that time are mentioned in Table 7 and Table 8 respectively.

Table 7. Vitals of the patient 1 month prior to the visit (18/08/2022)

Parameter	Findings
Date	18/08/2022
Cystatin C	2.7 mg/L
Urea	72 mg/dL
Creatinine	2.5 mg/dL
Uric acid	9.0 mg/dL
Sodium	135 mEq/L
Potassium	3.6 mEq/L
Chloride	101 mEq/L
Calcium	8.2 mEq/L
Phosphorus	4.7 mEq/L
Albumin	3.8 g/dL

Table 8. Allopathic medications taken by the patient before the visit

Medicine name	Dosage	Therapeutic effects
Febuxostat 40	1 tablet OD	Reduce the levels of uric acid in blood.
Alpha Ketoanalogue	2 TDS	Prevents the unnecessary increase in urea levels in the blood and improves the metabolism of proteins.
Erythropoeitin inj. 5k	2 per week	Helps alleviate symptoms of anemia associated with chronic kidney disease.
N-Acetylcycteine	1 tablet OD	Slows down the progression of CKD.

Table 9. Medications advised on follow up visit

Medicine Name	Ingredients	Dosage	Therapeutic Effects
Asthiposhak	Godanti, Shudh Shilajit (Asphaltum punjabianum), Ashwagandha (Withania somnifera), Tabaqsheer (Bambusa vulgaris), Pippali (Piper longum), Amba Haldi (Curcuma amada), Hadjorh (Cissampelos pareira), Maida Saq .	2 tablets BD (Adhobhakta with koshna jala)	Enhances bone strength, supports healing, and reduces joint pain.
CKD Syrup	Kasani (Cichorium intybus), Gokhru (Tribulus terrestris), Shatavari (Asparagus racemosus), Giloy (Tinospora cordifolia), Sorbitol, and Shudh Shilajit (Asphaltum punjabianum)	20 ml BD (Adhobhakta with samamatra koshna jala)	Provides relief from pain and discomfort associated with kidney issues.
Divya Shakti Powder	Trikatu, Triphala, Nagarmotha (Cyperus rotundus), Vay Vidang (Embelia ribes), Chhoti Elaichi (Elettaria cardamomum), Tej Patta (Cinnamomum tamala), Laung (Syzygium aromaticum), Nishoth (Operculina turpethum), Sendha Namak , Dhaniya (Coriandrum sativum), Pipla Mool (Piper longum root), Jeera (Cuminum cyminum), Nagkesar (Mesua ferrea), Amarvati (Achyranthes aspera), Anardana (Punica granatum), Badi Elaichi (Amomum subulatum), Hing (Ferula assafoetida), Kachnar (Bauhinia variegata), Ajmod (Trachyspermum ammi), Sazzikhar, Pushkarmool (Inula racemosa), Mishri (Saccharum officinarum).	Half a teaspoon HS (Nishikal with koshna jala)	Enhances overall vitality and energy levels, addressing fatigue and weakness.
Medh Vati	Brahmi (Bacopa monnieri), Shankhpushpi (Convolvulus pluricaulis), Vacha (Acorus calamus), Ashwagandha (Withania somnifera), Jatamansi (Nardostachys jatamansi), Ustukhuddus (Lavandula stoechas), Saunf (Foeniculum vulgare), Jyotishmati (Celastrus paniculatus), Gojihva (Onosma bracteatum), Praval Pishti, Mukta Pishti	2 tablets BD (Adhobhakta with koshna jala)	Enhances memory, reduces stress, and improves overall mental health.

Yakrit Shoth Har Vati	Punarnava (Boerhavia diffusa), Kalimirch (Piper nigrum), Pippali (Piper longum), Vayavidanga (Embelia ribes), Devdaru (Cedrus deodara), Kutha Haldi (Picrorhiza kurroa), Chitrake (Plumbago zeylanica), Herad Bahera (Terminalia chebula, Terminalia bellirica), Amla (Emblica officinalis), Danti (Baliospermum montanum), Chavya (Piper chaba), Indra Jon (Taraxacum officinale), Pippla Mool (Piper longum), Motha Kalajira (Nigella sativa), Kayphal (Myrica esculenta), Kutki (Picrorhiza kurroa), Nisoth (Operculina turpethum), Sonth (Zingiber officinale), Kakd Singhi (Cucumis sativus), Ajwaen (Trachyspermum ammi), Mandur Bhasma.	2 tablets BD (Adhobhakta with koshna jala)	Helps in better liver function ,Strengthen digestion process and Helps in Detoxification

Table 10. Medications advised on follow up visit after 1 year and 5 months

Medicine Name	Ingredients	Dosage	Therapeutic Effects
Divya Shakti Powder	Trikatu, Triphala, Nagarmotha (Cyperus rotundus), Vay Vidang (Embelia ribes), Chhoti Elaichi (Elettaria cardamomum), Tej Patta (Cinnamomum tamala), Laung (Syzygium aromaticum), Nishoth (Operculina turpethum), Sendha Namak , Dhaniya (Coriandrum sativum), Pipla Mool (Piper longum root), Jeera (Cuminum cyminum), Nagkesar (Mesua ferrea), Amarvati (Achyranthes aspera), Anardana (Punica granatum), Badi Elaichi (Amomum subulatum), Hing (Ferula assafoetida), Kachnar (Bauhinia variegata), Ajmod (Trachyspermum ammi), Sazzikhar, Pushkarmool (Inula racemosa), Mishri (Saccharum officinarum).	Half a teaspoon HS (Nishikal with koshna jala)	Enhances overall vitality and energy levels, addressing fatigue and weakness.
JS BP cure	Sarpgandha (Rauvolfia serpentina), Arjuna (Terminalia arjuna), Shigru (Moringa oleifera), Haritaki (Terminalia chebula), Vibhitaki (Terminalia bellirica), Amla (Emblica officinalis), Godanti Bhasma (Gypsum).	2 capsules BD (Adhobhakta with koshna jala)	Maintain a healthy heart functioning, kidney function, and improve digestive health
GFR Powder	Varun (Crateva nurvala), Punarnava (Boerhavia diffusa), Gokshur (Tribulus terrestris), Kaasni (Cichorium intybus), Bhumi Amla (Phyllanthus niruri), Shirish (Albizia lebbeck), Shigru (Moringa oleifera) and Apamarg (Achyranthes aspera)	Half a teaspoon BD (Adhobhakta with koshna jala)	Supports kidney function and reduces inflammation, helping with renal symptoms.
Sama vati	Gokru (Tribulus terrestris), Kaunch (Mucuna pruriens), Shatawar (Asparagus racemosus), Ashwagandha (Withania somnifera), Vidarikand (Pueraria tuberosa), Beej Band Lal (Sida cordifolia), Akarkara (Anacyclus pyrethrum), Talmakhana (Hygrophila auriculata), Musli (Chlorophytum borivilianum), Aawla (Emblica officinalis), Sonth (Zingiber officinale), Jaiphal (Myristica fragrans), Swarn Makshik (Chalcopyrite), Shilajit Shudh (Asphaltum punjabianum).	2 tablets BD (Adhobhakta with koshna jala)	Assist the regular function of the cardiovascular system

Mutravardhak vati	Gokshura (Tribulus terrestris), Guggula (commiphora wightii), Shunthi (Zingiber officinale), Krishan maricha (Piper nigerum), Pippal (Ficus religiosa), Vibhitaka (Terminalia bellirica), Haritaki (Terminalia chebula), Amalaki (Emblica officinalis), Motha (Cyperus rotundus)	2 tablets BD (Adhobhakta with koshna jala)	Support kidney health, dissolve kidney stones, and manage urinary disorders.

Dinner (6:15-7:30 PM): The patient will be served a raw salad, chutney, soup and green garden delight as Plate 1, along with fermented millets, millet khichdi, or millet chapatti as Plate 2 and raw ginger and turmeric.

e. Special Instructions:

Express gratitude to the divine before consuming food or drinks.

f. Diet Types:

The diet comprises solid, semi-solid, and smoothie options, all without added salt.

Recommended foods include red juice, a variety of steamed fruits, fermented millet shakes, steamed sprouts, soaked almonds and steamed salads.

The diet advised during each visits are mentioned in Table 11.

II. Lifestyle Recommendations

(i) Practice Sūrya Darśana (sun gazing) daily for a minimum of 30 minutes.
(ii) Include Dhyāna (meditation) for relaxation.
(iii) Walk briskly for 30 minutes while barefoot.
(iv) Ensure 6-8 hours of quality sleep each night (Nidra).
(v) Adhere to a structured daily routine (Dincharya).
(vi) Engage in Sukhasana & Sukhshama pranayama from 6am to 7am daily.

III. Panchakarma procedures administered to patients

1. Awagah Swedan

Procedure:

- The treatment begins with Abhyangam, herbal oil massage, to prepare the patient's body.
- Afterward, the patient is seated in a tub filled with warm, medicated water or herbal decoctions, with the water level adjusted to reach either the neck or navel, as prescribed.
- The immersion lasts for 30 to 60 minutes, with the water temperature maintained at 42°C and continuously monitored throughout the session.

Physiology:

- The heat improves blood circulation, helping to deliver nutrients and oxygen to tissues, which supports healing and relaxation.
- The warm, medicated water activates the sweat glands, encouraging perspiration and facilitating the elimination of toxins through the skin.
- It enhances the absorption of the herbal properties through the skin for added therapeutic benefit.
- The warm immersion soothes the nervous

Table 11. Diet during each visit

Date	Diet		
	Breakfast	Lunch	Dinner
18/09/2022	Fruits	Chapatti and Loki	Vegetable, Dal and Chapatti
30/12/2022	Fruits	Salad, Idli and Loki ki sabji	Millet Khichdi
10/05/2024	Fruits	Millet ki roti and salad	Millet ki roti and salad

system, alleviating stress and muscle tension while promoting deep relaxation.

Mode of Action:

The warm, medicated water or decoction helps dilate blood vessels, improving peripheral circulation due to the rise of body temperature. This process enhances the oxygen and nutrients delivery to tissues which promotes healing and reducing inflammation. The heat stimulates the sweat glands, inducing perspiration, which facilitates the removal of metabolic waste products and toxins like urea, creatinine, ammonia and uric acid from the body, thereby supporting detoxification processes.The temperature of the water also activates thermo receptors in the skin, which signal the hypothalamus to control body temperature. This leads to a reduction in muscle tension and promotes relaxation by modulating stress hormone levels, such as cortisol,epinephrine, norepinephrine and hormones from the thyroid gland. Additionally, the herbal compounds absorbed through the skin may exhibit anti-inflammatory, analgesic and antioxidant effects, contributing to the relief of pain, swelling and oxidative stress at the cellular level. The cumulative effect of these biochemical actions helps in the alleviation of musculoskeletal disorders, enhances tissue repair and restores overall balance in the body.

Sanskrit Reference:

स्वेदोऽस्मन्निहृदयेचापस्निगि्धंदधातभिषजम्।
अवगाहस्वेदनंहस्िफूर्तपि्रवृत्त्युपच्छदिम्॥[Sushruta Samhita, Chapter 14]

2. Gokshuradi Siddha Sneha Matra Basti

Procedure:

- The patient goes through Abhyanga (herbal oil massage) to prepare the body and ensure the digestive system is ready for the enema.
- A small amount (90ml) of medicated oil (sneha) infused with Gokshuradi is administered rectally using a specialized apparatus.
- The patient rests for a short period to allow the oil to be absorbed and then follows a light diet to support the digestive process.

Physiology:

- The medicated oil infiltrates the rectal mucosa, enhancing its absorption which lubricates the colon and nourishes the tissueswhich promotes smooth bowel movements.
- The warm temperature of the oil pacifies Vata dosa.
- The anti-inflammatory effect of Gokshuradi Siddha Sneha reduces the inflammations in gastrointestinal tract and other tissues

Mode of Action:

The preparation includes**Gokshura**, which contains active compounds such as saponins, flavonoids, and alkaloids which in turn exhibits diuretic, anti-inflammatory and antioxidant properties. Diuresis is promoted by the herbs which increases the renal blood flow and enhances the glomerular filtration rate, leading to increased urine output that facilitates detoxification. By inhibiting the pro-inflammatory cytokines, the herbal components in this basti helps to reduce inflammation in urinary tract and surrounding tissues. The combined diuretic and sudorific effects of this treatment facilitate the elimination of toxins through urine and sweat, reducing the load on the kidneys and promoting renal health. Furthermore, Gokshura is known to influence hormonal balance, particularly in the reproductive and urinary systems, potentially modulating testosterone levels and supporting reproductive health and function.

Sanskrit References:

" अयंतुबस्ती, आयुर्वेद्यांमृदु, श्लेष्माणाम्। तत्रयश्वासहेतुं, पति्तादौसमालोच्यते॥" [**Charaka Samhita,** Chapter 1, Verse 106]

3. Snehan

Procedure:

- Choose the appropriate medicated oil or ghee based on the patient's dosha imbalance and health condition.
- Internal Oleation: The patient consumes the medicated oil or ghee in gradually increasing doses over a period of 3 to 7 days, as prescribed.
- External Oleation: The patient undergoes a full-body massage with the medicated oil to ensure thorough absorption and to prepare the body for further treatments.

Physiology:

- The use of medicated oils or ghee helps to loosen

and relax the tissues, making them more flexible and ready for subsequent treatments.

- Helps to balance Vata by providing the necessary unctuousness and warmth, which counteracts the dry and rough qualities of Vata.
- The oils used in Snehan are absorbed through the skin and mucous membranes, delivering therapeutic substances directly to the tissues and aiding in the removal of toxins.

Mode of Action:

Medicated oils or ghee infused with various herbs known for their specific therapeutic properties are used for *Snehan* therapy. The oily base elevates the absorbing capacity of the skin, facilitating better intake of the herbal active compounds into systemic circulation, which aids in dissolving fat-soluble vitamins and phytochemicals.The therapy stimulates the sweat glands which promotes sweating aiding detoxification through skin. The warm oil application causes local vasodilation and increases blood flow to the area. The application of warm oil relaxes muscle fibers and connective tissues, improving overall mobility. Anti-inflammatory properties of oils used in *Snehan*, modules the release of pro-inflammatory cytokines and other mediators. In Ayurvedic terms, *Snehan* aids in balancing the three doshas (*Vata, Pitta*, and *Kapha*).

Sanskrit reference

स्नेहानांचतुश्रेयम्राश्नेषुचस्नेहनिाम्।
शरीरंसर्वगुणगुणंस्नेहात्परवृतंभवेत्॥ [Charaka Samhita, Sutra Sthana 2.12]

4.Shiro pichu

Procedure

- A cotton cloth (Pichu) is soaked in warm, medicated herbal oil.
- The soaked Pichu is placed on the anterior fontanelle (crown of the head) and secured with a cloth.
- The Pichu is left in place for about 45 minutes, after which a relaxing massage is given to the head and neck regions with warm oil.

Physiology

- The medicated oil placed on the top of the head penetrates the skin, allowing therapeutic compounds to be delivered directly to the tissues, thereby aiding in the healing process.
- The warm oil soothes the nervous system, alleviating stress and tension while encouraging mental relaxation.
- Applying the oil enhances blood circulation in the scalp, which nourishes the hair follicles and contributes to overall scalp health.

Mode of action

The oil absorbed through the scalp allows the active components to reach the tissues directly by which both the scalp and hair follicles are hydrated and nourished. The temperature of the oil boosts blood circulation, enhancing oxygen and nutrient delivery to the hair follicles while also promoting muscle relaxation through vasodilation. The Ayurvedic ingredients in the oil possess anti-inflammatory properties that assists the regulation of inflammatory responses and alleviating pain. Besides, the gentle application of the oil calms the nervous system, reducing stress and encouraging mental relaxation. **This**helps to balance the three doshas (Vata, Pitta and Kapha).

Sanskrit reference

तत्रस्नग्धिस्नानम्, शरिस्यतुष्टि; प्रीतचि, चत्तिशान्त; पत्तिवातक्षयच्च। **[Sushruta Samhita, Sutra Sthana 34.14]**

5. HDT[18]

Procedure

- Patientis made to lie at 10˚ angle of the head.
- The patient lies on a tilted surface with their head and upper body lower than their legs.
- This position is continued for about approximate 1 hour.

Physiology

- HDT therapy enhances blood flow towards the kidneys by positioning the head lower than the legs. This stimulates self-dialysis and thus improves kidney function which leads to the reduction of harmful hormone levels like Plasma Aldosterone and Renin.
- HDT therapy can regulate blood pressure by controlling the baroreceptor reflex. This occursbecause of theincrease in thoracic blood volume, which boosts prevoid and stroke volume, leading to the activation of parasympathetic system and/or withdrawal of sympathetic system.
- Elimination of the toxins leads to the detoxification of the body which is caused by the improved blood circulation and kidney function.

Mode of action

During HDT, blood tends to shift towards the upper body, leads to the increase in central blood volume. Baroreceptors of the body detects this shift which leads to the changes in hormonal and renal systems by activating Renin angiotensin-aldosterone system (RAAS) pathway, maintaining blood pressure and sodium-potassium balance. This also triggers the hormones like antidiuretic hormone (ADH) and aldosterone, which play roles in fluid retention or excretion by the kidneys. Nitric oxide production increases due to the increased pressure and shear stress on vascular endothelial cells, which helps in vasodilation and regulating blood pressure.

Medicinal Interventions: The Ayurvedic regimen employed in this case included Chander Vati,JS BP cure, Kidney Care Syrup, Trivrit avleh, Yakrit Shoth Har Vati, CKD Syrup, Divya Shakti Powder, Nephron plus, Asthiposhak, Medh Vati, GFR Powder, Sama vati, Mutravardhak vati along with Panchakarma therapies.

RESULT

Effectiveness of Ayurvedic Treatments:

After 7 days of Ayurvedic treatment, the patient experienced significant improvement in both symptoms and diagnostic parameters, indicating that these interventions can effectively assist in managing CKD. The eGFR was 25 ml/min/1.73m² and after 3 months it was noted 48 ml/min/1.73m² The positive changes in global glomerular filtration rate (GFR) highlight the potential benefits of these traditional therapies for enhancing kidney function and overall health.**Fig.1** represents the assessment of vitals of the patient.After 7 days of therapy during discharge patient was advised to take the medications, Asthiposhak, CKD Syrup, Divya Shakti Powder, Medh Vati and Yakrit Shoth Har Vati. As a result, during the follow up visit noticeable increase in hemoglobin level is observed. Also the amount of urea, creatinine and uric acid were reduced. The level of sodium decreased whereas potassium and chloride increased. A slight reduction in MCV is also noticed.

Further Research:

Results of this case study appears promising, as this involves only one patient, the findings should be viewed with extreme attention. Further studies, including larger and randomized controlled trials are required to confirm the efficacy and safety of Ayurvedic treatments for CKD and to establish standardized guidelines for their use in clinical settings.

DISCUSSION

In this case, treatment of chronic kidney disease (CKD) using Ayurvedic medicine offers a promising alternative. This case report summary the use of various Ayurvedic therapies in a 42-year-old male diagnosed with CKD for 2 years and hypertension for 10 years. The patient exhibited symptoms such as frothy urination, constipation and general weakness. The Ayurvedic treatment comprised following Panchakarma procedures:

Awagaha Sweda: In this therapy, the patient immersed up to neck in a tub with warm, herbal-infused water at 42°C. Sweating and enhanced blood circulation is induced by this process which leads to the removal of toxins and metabolic byproduct wastes and improves the absorption of phytochemicals in the Ayurvedic herbs.

Gokshuradi Siddha Sneha Matra Basti: Warm Gokshuradi Siddha oil is applied rectally to lubricate the intestines, balance the Vata dosha, and improve overall bodily functions by dispersing through the body through the large intestine.

Snehan: There are both internal and external Oleation. It helps to reduce the dry and rough qualities of Vataalso stimulates sweating which results in the removal of body toxins through skin. The warmth of the oil provides vasodilation which increased blood flow.

Shiro pichu: The medicated oil is placed in the crown portion of the head which is directly absorbed by scalp and hair follicles to the body. The warm oil increase vasodilation, blood circulation, muscle relaxation and mental relaxation.

HDT: The patient is advised to lie at an angle of 10° head down position for 1 to 2 hours. This helps to enhance kidney function by increasing the blood flow. Due to improved blood circulation and kidney function the elimination of toxins from the body are elevated.

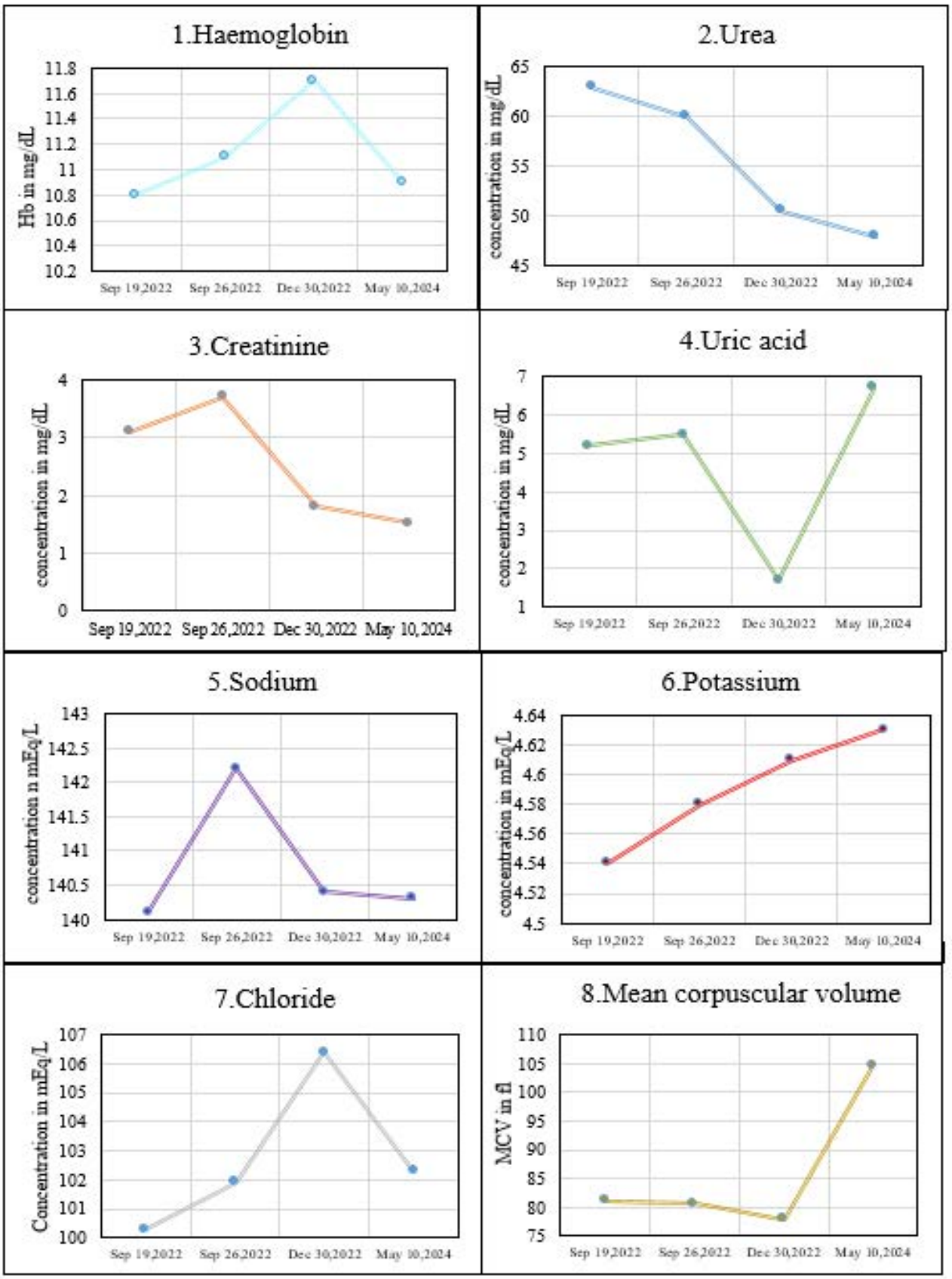
The Ayurvedic treatment procedure for this case included a variety of medications such as Asthiposhak, Chander Vati, CKD Syrup, Divya Shakti Powder, GFR Powder, JS BP cure, Kidney Care Syrup, Medh Vati, Mutravardhak tablets, Nephron plus, Sama vati, Trivrit avleh, Yakrit Shoth Har Vati along with Panchakarma therapies, designed to improve kidney function and improve symptoms. The patient reported significant relief from key symptoms like constipation and frothy urination.

Divya Shakti Powder: This is an Ayurvedic formulation recognized for increasing energy, improving stamina, and stimulating overall vitality. It is prepared by powerful herbs, each known for their refreshing and strengthening properties. This improves physical endurance, support immunity, and balance the three doshas of body. Its use in a regular basis can restore energy and promote a sense of vitality.

CKD Syrup: This syrup contains natural herbs like punarnava, Gokhru and Varuna known for their kidney protective properties. These herbs detoxify the kidneys, reducing fluid retention and control blood pressure.

Asthiposhak tablets: This contains a mixture of Ayurveda herbs and minerals which enhances bone density, flexibility of the joints and reduce weak bone problems.

Fig.1Graphical representation of the assessment of the patient's laboratory investigation.



Chander Vati: An Ayurvedic herbal formulation typically used to treat gastrointestinal problems and to improve digestion. It is usually used to treat indigestion, bloating, loss of appetite and acidity. The key ingredients in Chander Vati helps to balance stomach acids and reduce digestive issues. It balances Pitta dosha, relieving urinary tract infections. This also aids to eliminate harmful toxins from body. The diuretic effects contribute to the effective management of CKD.

GFR Powder: This powder removes accumulated toxins and minimize inflammation to enhance the kidney function.Because of its anti-inflammatory properties renal inflammation are reduced which supports the overall kidney fitness and detoxification.

JS BP Cure: The key ingredients of this formulation are Arjuna, ginger, garlic, hibiscus, ashwagandha, and punarnava, which help regulate blood pressure, stress reduction, improve circulation, and support in detoxification.

Kidney Care Syrup: The ingredients in this syrup work together to reduce inflammation, cleanse kidneys, reduce water retention, and manages conditions like kidney stones and urinary tract infections and support detoxification. Punarnavarishtha, Ushirasava and Gokshuradi Kadha in this syrup promotes diuresis and toxin elimination.

Medh Vati: This supports cognitive function by reducing anxiety and stress. The primary focus of Medh vati is enhancing mental clarity and memory. This helps to regulate the mental instability which often come along with CKD.

Mutravardhak Vati: This Ayurvedic formulation consist of Gokshura, Haritaki, Vibhitaki, Shunthi which have diuretic properties & it alleviates fluid retention in the body which helps the overall well-being of CKD patients.

Nephron Plus: This formula contains ingredients like Punarnava, Gokshura, Varuna, Amla and Bhumyamalaki, which have renal protective and detoxifying potentials. It supports kidney function, stimulates urinary health, decreases fluid retention and provides antioxidant protection, making it favorable for CKD.

Sama Vati: Sama Vati is an Ayurvedic preparation which boost body metabolism. It consists of Ashwagandha, Musli, Gokshura, Amla, Shunthi, Swarna makshika & Shudha shilajita which helps in body detoxification & improves metabolism.

Trivrit avleh: This promotes digestive health and aids detoxification. The primary ingredient, Trivrit is known for its laxative properties which alleviates constipation issues.

Yakrit Shoth Har Vati: This formulation specifically helps in liver and kidney health. The herbs used in this contains hepatoprotective and diuretic properties. This thereby helps in detoxification process.

In conclusion, Ayurvedic treatments provides a consolidated strategy for managing CKD. These therapies not only alleviate the visible symptoms but also address the underlying imbalances, enhancing kidney health and overall patient well-being. While additional research is needed to confirm these findings and optimize treatment approaches for CKD, the positive results from this case report point to that these Ayurvedic interventions may offer significant role in CKD management, especially in zones where conventional treatments are not readily available.

CONCLUSION

The case report on the treatment of CKD through Ayurvedic interventions can be summarized as follows:

Symptoms: Before the treatment, the patient experienced various symptoms, including constipation, frothy urination and general weakness. He also experienced hemoptysis a month prior to the visit. After 7 days of IPD and one year of follow-up Ayurvedic care, there was a significant development in symptoms. The patient reported clear urine, relief from constipation and reduced general weakness, with no new complaints, which indicates a noticeable enhancement in overall well-being.

Vitals: The patient's vital signs fluctuated throughout the treatment period. Blood Pressure remained stable throughout during IPD stay. The patient's weight also decreased from 71.7 kg to 70.6 kg, reflecting positive lifestyle changes and potential improvements in kidney function.

Investigations: Laboratory tests showed marked improvements in renal function parameters. Serum urea levels decreased from 62.9 mg/dLto 47.98 mg/dL, serum creatinine level also decreased from 3.1 mg/dL to 1.52 mg/dL indicating better kidney function. There was also no presence of urine protein and urine glucose. The estimatedglomerular filtration rate (eGFR) improved from 25 ml/min/1.96 sq m to 48 ml/min/1.82 sq m, reflecting a significant increase in the kidney's filtration capacity.

This case study report helps to conclude that integrating Ayurvedic interventionsalong with previously prescribed allopathic interventionsfor CKD exhibited promising results, showingconsiderabledevelopments in symptoms, vital signs and laboratory examinations. From this we can infer the ability of traditional treatment methods and therapies in increasing kidney health and overall well-being of the patient. However, more investigations and research on this is much needed to validate the findings and establishment of standard treatment protocols.

Reference:

- Levey, A. S., & Coresh, J. (2012). Chronic kidney disease. *The Lancet, 379*(9811), 165–180.
- Kalantar-Zadeh, K., Jafar, T. H., Nitsch, D., Neuen, B. L., & Perkovic, V. (2021). Chronic kidney disease. *The Lancet, 398*(10302), 786–802.
- Hazin, M. A. (2020). Anemia in chronic kidney disease. *Revista da Associação Médica Brasileira, 66*(Suppl 1), s55–s58.
- Ikee, R., Sasaki, N., Yasuda, T., & Fukazawa, S. (2020). Chronic kidney disease, gut dysbiosis, and constipation: A burdensome triplet. *Microorganisms, 8*(12), 1862.
- Jager, K. J., Kovesdy, C., Langham, R., Rosenberg, M., Jha, V., & Zoccali, C. (2019). A single number for advocacy

and communication—Worldwide more than 850 million individuals have kidney diseases. *Nephrology Dialysis Transplantation, 34*(11), 1803–1805.

- Shaddick, G. (2016). Global, regional, and national life expectancy, all-cause mortality, and cause-specific mortality for 249 causes of death, 1980–2015: A systematic analysis for the Global Burden of Disease Study 2015. *The Lancet, 388*(10053), 1459–1544.
- Agnivesha, Charaka, & Chakrapani. (2021). *Charaka Samhita, Ayurved Deepika* (Vimanasthana, Chapter 5, Verse 8, p. 251). Varanasi: Chaukhamba Krishnadas Academy.
- Susrutha, Dalhana. (2013). *Susrutha Samhitha, Nibandhasamgraha Commentary* (Sareerasthana, Chapter 4, Verse 31, p. 358). Varanasi: Chaukhamba Surabharati Prakashan.
- Anburani, S., Rao, A. M., Naragatti, S., & Dhayal, S. (2023). Case study: Naturopathy intervention in the management of creatinine levels in CKD patients.
- Teo, W. Y., Chu, S. W., Chow, L. Y., Yeam, C. T., Low, L. L., Quah, J. H., Foo, M., & Seng, J. J. (2022). Role of alternative medical systems in adult chronic kidney disease patients: A systematic review of literature. *Cureus, 14*(12).
- Borkar, P., Yadav, V., Tiwari, R. R., & Samarth, R. M. (2022). A systematic review of potential candidates of herbal medicine in the treatment of chronic kidney disease. *Phytomedicine Plus, 2*(4), 100361.
- Borkar, P., Yadav, V., Tiwari, R., & Samarth, R. (2022). Current approaches in the therapeutic use of herbal medications for chronic kidney diseases. *Authorea Preprints.*
- Verma, S. K., Pandey, M., Sharma, A., & Singh, D. (2024). Exploring Ayurveda: Principles and their application in modern medicine. *Bulletin of the National Research Centre, 48*(1), 77.
- Srivastava, A. K., Negi, M., Vandana, & Painuly, P. (2024). A case study on Ayurvedic management of chronic kidney disease. *International Journal of Advanced Research, 707–712.* ISSN 2320-5407.
- Mishra, S., Dash, R., Sapna, & Kumar, S. (2024). Chronic kidney disease in light of Ayurveda: A literary review on Vataj Pandu. *International Journal of Ayurveda and Pharma Research, 12*(4), 65–68. https://doi.org/10.47070/ijapr.v12i4.3193
- Dang, P., et al. (2024). Chronic kidney disease (CKD) pathogenesis in Ayurveda parlance—A review. *International Ayurvedic Medical Journal.* [Online]. Retrieved January 2024.
- Manish, Chaudhary, G., Singh, S. P., Singh, M., & Richa. (2024). Clinical evaluation of chronic kidney disease management: Integrating lifestyle modification and Ayurveda. *International Journal of AYUSH, 2013*(10). https://doi.org/10.22159/prl.ijayush.v2013i10.1152
- Pandey, A., Azad, A. S., Bhardwaj, A., Thakur, G., & Prakash, G. (2022). Effectiveness of Gravitational Resistance and Diet (GRAD) system in reversing chronic kidney disease (CKD) among dialysis patients. *Dayanand Ayurvedic College, Shridhar University.* https://davayurveda.com/wp-content/uploads/2022/10/j-GRAD-System-Paper-FINAL-Mar-27-2.pdf
- Sushruta Samhita, Chapter 14.
- Charaka Samhita, Chapter 1, Verse 106.
- Charaka Samhita, Sutra Sthana 2.12.
- Sushruta Samhita, Sutra Sthana 34.14.