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Effectiveness of Ayurvedic and Panchakarma Therapies in Managing Chronic Kidney Disease: A Case Study Report

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ABSTRACT

Chronic kidney disease (CKD) is defined as a progressive disease that affects the overall health of kidney. CKD is diagnosed in five stages based on its symptoms and the structure and function of kidney. CKD can be significantly influenced by several lifestyle factors. Poor dietary habits, such as high intake of salt, sugar, unhealthy fats, and processed foods, contribute to obesity, hypertension, and diabetes, key risk factors for CKD. Hence, the CKD treatment requires a multifaceted approach including adopting a healthy lifestyle with a balanced diet, regular exercise, stress management, and proper hydration. This case report focuses on a 31-year-old female patient with CKD for 2 years and hypertension for 6 months who received *Ayurvedic* treatment at Jeena Sikho Lifecare Limited Hospital, Derabassi. The treatment method administered on her was a combination of customized *Ayurveda* and *Panchakarma* therapies, resulting in significant progresses in her symptoms, kidney health and function, and general life quality. After 7 days of IPD, the patient showed improvement in Blood Urea and Serum Creatinine, also reported relief from periorbital swelling and other symptoms. This study highlights the potential of Ayurveda as an economical alternative to conventional treatments, especially for individuals with limited financial resources who face challenges in accessing advanced healthcare. While the results are encouraging, further research with larger randomized controlled trials is essential to assess the effectiveness and safety of *Ayurvedic* treatments for CKD.

Introduction

Chronic Kidney Disease (CKD) is characterized by structural or functional kidney abnormalities persisting for over three months. Its increasing prevalence presents significant

challenges for healthcare systems, escalating medical costs worldwide ^[1]. CKD progresses through cellular injury and nephron loss, commonly caused by diabetes, hypertension, and heavy metal exposure, ultimately impairing renal function ^[2]. Globally, approximately 800 million individuals

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suffer from CKD, which disrupts essential physiological processes and, if untreated, leads to complications such as hyperkalaemia and metabolic acidosis [3]. Early-stage CKD is typically asymptomatic but significantly heightens the risk of cardiovascular diseases, making early detection crucial to preventing kidney failure [4]. In women, CKD can contribute to menstrual irregularities, decreased libido, high-risk pregnancy, and early menopause [5]. Although effective treatments exist, late diagnoses, lack of awareness, and systemic disparities limit proper healthcare access [6]. CKD is now the seventh leading cause of mortality globally and is projected to rank fifth by 2040, with obesity, lifestyle changes, and climate change exacerbating its prevalence [7,8]. In India, CKD poses a particularly severe public health burden, especially in eastern regions, due to environmental factors, limited healthcare infrastructure, and high diabetes and hypertension rates [11]. Patient education on lifestyle changes can help slow disease progression and improve outcomes [10]. However, CKD in rural India is often diagnosed late, with approximately 210,000 new cases annually. Socioeconomic challenges, high treatment costs, and restricted healthcare access force many patients to abandon treatment within a year [12]. India's end-stage renal disease (ESRD) incidence rate is 229 per million, highlighting substantial healthcare and economic concerns. Preventive measures and early detection are critical in managing CKD, largely driven by hypertension, diabetes, and socioeconomic disparities [13].

CKD patients frequently experience periorbital swelling due to fluid retention, electrolyte imbalances, and complications such as infections and inflammation. Proper management includes fluid intake control, blood pressure regulation, and infection prevention [14]. Lower limb pain, affecting 50%-70% of CKD patients, is often linked to hyperuricemia, arthritis, and calcium-phosphate metabolism abnormalities, further complicating treatment [15,16,17,18]. Modern CKD management emphasizes early diagnosis, lifestyle modifications, and regular kidney function monitoring to slow disease progression and prevent complications [7,9].

Ayurveda provides a holistic approach to CKD, using herbs like *Punarnava*, *Gokshura*, and *Brahmi* to enhance kidney function. *Panchakarma* therapies such as *Vamana*, *Virechana*, and *Basti* aid in detoxification and *dosha* balance [19]. *Ayurvedic* dietary recommendations focus on reducing protein and salt intake while promoting diuretic and anti-inflammatory foods [20]. Herbal tea from *Punarnava* and *Gokshura*, combined with stress management and yoga, offer a comprehensive CKD management strategy [20,21]. This study deals with the *Ayurvedic* interventions with *Panchakarma* therapy and conventional methods to maintain CKD.

CASE REPORT

A 31-year-old female with a history of CKD for 2 years and hypertension for 6 months visited Jeena Sikho Lifecare

Limited Hospital, Derabassi (Punjab) on May 14, 2024. A detailed and systematic evaluation was performed, including a complete medical history, family history, physical checkup, and diagnostic assessments. Her symptoms were periorbital swelling, pain in lower limb and mild shortness of breath on exertion. She also had fungal infection (ring worm) between the thighs. She was diagnosed with hypertension for 6 months and hyperthyroidism for 6 years prior to her hospital admission. The patient was advised for MHD but not continuing during the visit. The problem started with chest and back pain a year ago the visit. Vital investigation results showed high serum creatinine and blood urea. Allopathic medications were taken after CKD was diagnosed. After increased weakness, creatinine and urea level, she was advised for dialysis twice a week. The vital signs along with *Astha sthana pariksha* report during the first day of visit is detailed in Table 1.

Table 1 Vitals during the initial examination on first day of the visit

| Parameter | Findings |
|-------------------|---------------------|
| Temperature | 98.2°F |
| Blood Pressure | 150/90 mm of Hg |
| Pulse Rate | 96/min |
| Weight | 37 Kg |
| Oxygen Saturation | 99% |
| <i>Nadi</i> | <i>Vataj Pittaj</i> |
| <i>Mutra</i> | <i>Avikrita</i> |
| <i>Jivha</i> | <i>Saam</i> |
| <i>Shabda</i> | <i>Spashta</i> |
| <i>Nidra</i> | <i>Prakrita</i> |
| <i>Drik</i> | <i>Prakrita</i> |
| <i>Mala</i> | <i>Abadha</i> |

The patient was admitted for 7 days, during that period he received consolidated *Ayurvedic* treatments. This treatment procedure included *Panchakarma* therapies such as *Matra basti* with *Gokshuradi* and *Punarnavadi*, *Shiropchu* with *Brahmi* oil and *Abhyangam* with *Bala* oil and a blend of Naturopathy and *Panchakarma* therapies such as *Awagaha swedan* and Chest and Legs *Lepam* with *Dashmool* and *Dashanga*.

The patient was advised to take Chander Vati Tablet, Asthiposhak Vati and GFR powder throughout the IPD. Vitals observed during the treatment investigations conducted on the May 14, 2024 are detailed in Table 2. After 7 days of treatment, the patient experienced significant improvement in the symptoms.

Table 2 Vitals observed during the IP treatment Investigation on the date of admission

| Parameter | Findings |
|-----------------------|--------------------------------------|
| Date | 14-05-2024 |
| Haemoglobin | 10.7 gm/dL |
| Intact PTH | 389.30 pg/dL |
| eGFR | 5 ml/min/1.73m ² |
| Rapid Tests | Non-reactive for HIV, HBsAg, and HCV |
| Glucose | Trace |
| Protein | ++ |
| Pus cells | 1-2 |
| Epithelial cells | 2-3 |
| Calcium | 7.72 mg/dL |
| Lipid Profile | |
| Total Cholesterol | 205.15 mg/dL |
| HDL | 40 mg/dL |
| LDL | 140.65 mg/dL |
| VLDL | 24.50 mg/dL |
| Cholesterol/HDL Ratio | 5.13 |
| Triglycerides | 122.49 mg/dL |

The eGFR noted on May 11, 2024, prior to the visit was 5 ml/min/1.73m². The vitals observed during the IPD treatment on daily basis are detailed in Table 3. Investigations conducted during the treatment is mentioned in Table 4. The vitals fluctuated throughout the IPD treatment. The patient was afterward discharged on May 20, 2024. Vital signs with *Nadi pareeksha* during the time of discharge is given in Table 5.

Table 3. Daily vitals observed during the IPD treatments

| Date | Time | Weight in Kg | Temperature in F | Blood Pressure (mmHg) | Pulse per min |
|------------|----------|--------------|------------------|-----------------------|---------------|
| 14-05-2024 | 4:00 PM | - | 98.2° F | 150/90 | 96 |
| | 8:00 PM | - | 97° F | 160/100 | 86 |
| 15-05-2024 | 5:00 AM | - | 97° F | 160/100 | 84 |
| | 9:00 AM | 37 Kg | 97.2° F | 150/100 | 88 |
| | 7:00 PM | 38 Kg | 98° F | 140/90 | 90 |
| 16-05-2024 | 5:00 AM | - | 98° F | 140/100 | 82 |
| | 9:00 AM | 38 Kg | 97.2° F | 130/80 | 86 |
| | 8:00 PM | 37 Kg | 97.4° F | 140/100 | 82 |
| 17-05-2024 | 5:00 AM | - | 98° F | 130/90 | 86 |
| | 5:00 PM | 37Kg | 97.6° F | 140/100 | 88 |
| | 8:00 PM | - | 98° F | 140/100 | 92 |
| 18-05-2024 | 5:00 AM | - | 98° F | 130/80 | 88 |
| | 10:00 AM | 37 Kg | 97.2° F | 130/80 | 96 |
| 19-05-2024 | 8:00 PM | 37 Kg | 97° F | 140/100 | 97 |
| | 8:00 AM | 37 Kg | 97.4° F | 130/80 | 99 |
| | 9:00 AM | - | 98° F | 130/80 | 96 |
| 20-05-2024 | 8:00 PM | - | 97.4° F | 140/80 | 88 |
| | 5:00 AM | - | 98.4° F | 130/80 | 78 |
| | 9:00 AM | 37 Kg | 97.8° F | 120/80 | 96 |

Table 4. Vitals signs observed during the treatment period

| Parameter | Findings | | | |
|-------------|--------------|--------------|------------|------------|
| | Date | 14-05-2024 | 19-05-2024 | 12-06-2024 |
| Haemoglobin | 10.7 gm/dL | - | 7.50 gm/dL | |
| Urea | 180.11 mg/dL | 143.13 mg/dL | 82 mg/dL | |
| Creatinine | 9.52 mg/dL | 8.29 mg/dL | 6.82 mg/dL | |
| Uric acid | 7.48 mg/dL | 4.80 mg/dL | 7.82 mg/dL | |
| Sodium | 142 mEq/L | 140.2 mEq/L | - | |
| Potassium | 4.93 mEq/L | 4.97 mEq/L | - | |
| Chloride | 105.1 mEq/L | 105.6 mEq/L | - | |

Table 5. Vital signs with *Nadi pareeksha* during the time of discharge

| Parameter | Findings |
|-------------------|---------------------|
| Temperature | 97.8°F |
| Blood Pressure | 110/70 mm of Hg |
| Pulse Rate | 80/min |
| Weight | 37 Kg |
| Oxygen Saturation | 98% |
| <i>Nadi</i> | <i>Vataj Pittaj</i> |
| <i>Mutra</i> | <i>Avikrita</i> |
| <i>Jivha</i> | <i>Avikrita</i> |
| <i>Shabda</i> | <i>Spashta</i> |
| <i>Nidra</i> | <i>Sukhada</i> |
| <i>Drik</i> | <i>Prakrita</i> |
| <i>Mala</i> | <i>Saam</i> |

Medicinal Interventions

The *Ayurvedic* treatment employed in this case GFR Powder, Chander Vati Tablet, Asthiposhak Vati, CKD Tablet, Renal support syrup, Divya Shakti Powder, Ladies tonic, Fe Capsule and Sama vati along with *Panchakarma* therapies.

Allopathic medications such as Calcium Acetate Tablet, Calcitriol (0.25mcg), Sodium Bicarbonate (1000mg) and Cyanocobalamin / Vitamin B12 (0.75 Mcg) + Elemental Iron (30 Mg) + Folic Acid (300 Mcg) + Vitamin C / Ascorbic Acid (50 Mg) were provided during IPD.

An accurately designed DIP Diet was provided to the patient to complement the *Ayurvedic* treatments administered for CKD^[22].

Treatment Plan

I. Diet Plan:

The dietary guidelines provided by Jeena Sikho Lifecare Limited Hospital include the following key commendations:

a. Foods to be avoided:

- Do not consume wheat, refined food, milk and milk products, coffee and tea and packed food.
- Avoid eating after 8 PM.
- During solid consume as small bite, chew 32 times.

b. Hydration:

- During water intake, take sip by sip and drink slowly to ensure the amount of water intake each time.
- Drink about 1 litre of alkaline water 3 to 4 times throughout the day.
- Include herbal tea, living water, and turmeric-infused water part of your daily routine.
- Boil 2 litre water to reduce up to 1 litre and consume.

c. Millet Intake:

- Incorporate five types of millet into your diet: Foxtail (*Setaria italica*), Barnyard (*Echinochloa esculenta*), Little (*Panicum sumatrense*), Kodo (*Paspalum scrobiculatum*), and Browntop (*Urochloa ramosa*).
- Use only steel cookware for preparing the millets
- Cook the millets only using mustard oil.

d. Meal Timing and Structure:

1. Early Morning (5:45 AM): Herbal tea, curry leaves (1 leaf-1 min/5 leaves-5 min) along with raw ginger and turmeric.
2. Breakfast (9:00-10:00 AM): The patient will have steamed fruits (Seasonal), steamed sprouts (according to the season) and a fermented millet shake (4-5 types).
3. Morning Snacks (11:00AM): The patient will be given red juice (150 ml) and soaked almonds.
4. Lunch (12:30 PM - 2:00 PM): The patient will receive Plate 1 and Plate 2. Plate 1 will include a steamed salad, while Plate 2 with cooked millet recipe.

5. Evening Snacks (4:00 – 4:20 PM): Green juice (100-150 ml) along with 4-5 almonds.

6. Dinner (6:15-7:30 PM): The patient will be served a steamed salad, chutney, and soup, as Plate 1, along with millet *khichdi* as Plate 2.

e. Fasting:

- One-day fasting was advised.

f. Special Instructions:

- Express gratitude to the divine before consuming food or drinks.
- Sit in *Vajrasana* (a yoga posture) after each meal.
- 10 minutes slow walk after every meal.

g. Diet Types:

- The diet comprises low salt solid, semi-solid, and smoothie options.
- Suggested foods include herbal tea, red juice, green juice, a variety of steamed fruits, fermented millet shakes, soaked almonds, and steamed salads.

II. Lifestyle Recommendations

- (i) Include meditation for relaxation.
- (ii) Practice barefoot brisk walk for 30 minutes.
- (iii) Yoga practice (Sukhasana and Sukshma Paranayama) are advised.
- (iv) Ensure 6-8 hours of quality sleep each night.
- (v) Adhere to a structured daily routine.

III. Panchakarma procedures administered to patients

1. *Awagah Swedan*^[23]

Procedure:

- The patient is immersed up to the navel in a tub of warm water.
- Sweating is encouraged by maintaining the water temperature at 42°C.
- The procedure is recommended to be followed for

20 minutes.

- The therapy was discontinued starting May 16, 2024 because of menstruation.

Physiology:

- The elevated temperature induces vasodilation, which improves blood flow to the skin.
- Sweating, prompted by the water temperature, facilitates the elimination of metabolic waste and toxins.
- The healing properties of the *Ayurvedic* herbal infusion are absorbed into the skin.

Mode of Action:

- Immersion in 42°C water induces systemic vasodilation, increasing peripheral blood flow.
- The body raises circulation to dissipate the warmth, enhancing skin and tissue perfusion.
- Warm water exposure activates the sympathetic nervous system (SNS), releasing catecholamine (epinephrine, norepinephrine).
- Stimulates the release of endorphins, cortisol, oxytocin, serotonin, and melatonin, influencing mood, stress response, and metabolism.
- Elevated temperature and metabolic rate increase aerobic metabolism and oxygen demand.

2. *Matra Basti* with *Gokshura* and *Punarnava*^[24]

Procedure

- *Gokshura* and *Punarnava* roots were boiled indirectly in water.
- Infused medicines oil over time to create a concentrated preparation.
- The patient was positioned in the left lateral position to facilitate enema administration.
- 90 ml of the prepared medicated oil was administered into the rectum using an enema nozzle.
- The patient was instructed to retain the enema for 15-20 minutes.

Physiology

- Vasodilation and improved circulation enhance tissue perfusion and support kidney function.

- Stimulation of the sympathetic nervous system raises metabolism, increases oxygen demand, and boosts energy expenditure.
- Detoxification is facilitated through greater urine production and sweating, aiding in the elimination of waste and toxins from the body.
- Fluid and electrolyte balance is maintained, helping to alleviate edema and support proper kidney function.
- Hormonal balance is impacted, including the regulation of stress and reproductive hormones, which contributes to overall resilience.
- Increased metabolic activity and oxygen usage accelerate fat breakdown, enhance detoxification, and optimize cellular processes.

Mode of action

- Rectal absorption of compounds from *Gokshura* and *Punarnava* via the rectal mucosa enhances bio-availability, bypassing digestion.
- Oils used in *Matra Basti* improve the absorption of fat-soluble compounds, ensuring effective delivery to target organs.
- *Gokshura* promotes diuresis by enhancing renal filtration, improving blood flow, and excreting waste products like urea and creatinine, stimulates HPA axis, promoting cortisol and aldosterone release, and boosts testosterone and growth hormone production, improving stress resilience and muscle recovery, antioxidants neutralize ROS and free radicals, supporting cellular repair and metabolic health, inhibits pro-inflammatory cytokines (e.g., TNF- α , IL-6) and the COX-2 pathway, reducing systemic inflammation in conditions like arthritis, and maintains electrolyte balance by regulating sodium and potassium levels in the kidneys, promoting fluid and electrolyte homeostasis.
- *Punarnava* increases GFR and urinary output, supporting detoxification and alleviating edema and renal insufficiency, modulates adrenal and pituitary hormones, helps regulate thyroid function, and may reduce cortisol to support metabolic balance and stress response, activates phase I and II detox enzymes (e.g., cytochrome P450, GST) in the liver, enhancing the clearance of lipophilic toxins through urine and bile, modulates immune responses, regulating cytokines (TNF- α , IL-6) and IFN- γ , balancing immune activation and suppression.
- Thermogenic effect of *Matra Basti* increases lipoly-

sis via saponins in *Gokshura* which activate lipolytic enzymes (e.g., hormone-sensitive lipase), converting triglycerides to free fatty acids for energy.

3. *Shiropichu* with *Brahmi* oil^[25]

Procedure:

- *Brahmi* oil was made by infusing *Bacopa monnieri* in a base oil and indirectly warmed to a comfortable, non-hot temperature to facilitate absorption.
- The patient was placed in a supine position with a headrest to keep the head steady during the treatment.
- A thick cotton cloth was soaked in the warm *Brahmi* oil and applied to the top of the crown area. The cloth was positioned to cover the crown and held in place throughout the procedure.
- The *Brahmi* oil remained on the scalp for 20-30 minutes, allowing for absorption.

Physiology:

- *Brahmi* oil penetrates the scalp via hair follicles, delivering bioactive compounds like bacosides for anti-inflammatory and antioxidant benefits, promoting skin health.
- Stimulates the CNS, improving memory, focus, and mood by supporting neurogenesis and balancing neurotransmitters like dopamine and serotonin.
- Activates the parasympathetic nervous system (PNS), reducing stress, anxiety, and mental tension, fostering relaxation and mental calm.
- Warm oil and massage improve blood flow to the brain, enhancing cognitive performance by increasing oxygen and nutrient delivery.
- Helps regulate stress hormones (cortisol, adrenaline) and mood-related hormones (serotonin, melatonin), improving mental clarity and sleep.
- Enhances circulation, reduces inflammation, and nourishes hair follicles, promoting healthy hair growth and reducing scalp issues like dandruff.

Mode of Action:

- The oil's ability to penetrate the scalp's hair follicles and sebaceous glands allows the active compounds

in *Brahmi* to enter systemic circulation.

- Once absorbed, these compounds travel to the brain, enhancing cognitive functions and offering neuro-protection.
- *Brahmi* oil promotes the growth and repair of neural tissues, boosting memory, learning, and cognitive function. Also it helps to balance neurotransmitters such as dopamine, serotonin, and acetylcholine, improving mental clarity, focus, and memory
- By modulating the dopamine and serotonin systems, *Brahmi* oil helps regulate stress hormones like cortisol, promoting a positive mood and emotional stability.
- Applying *Brahmi* oil through techniques like *Shiropichu* can activate the PNS, inducing a relaxed state and reducing mental fatigue. This activation lowers *sympathetic* nervous system activity, reducing stress hormones and anxiety.
- *Brahmi* oil promotes microcirculation in the scalp, delivering more oxygen and nutrients to hair follicles, stimulating hair growth, and improving scalp health.

4. *Abhyangam* with *Bala* oil^[26]

Procedure

- A warm and peaceful atmosphere was created for the massage, then gently heated the *Bala* oil to a comfortable, safe temperature.
- Began by massaging the scalp in circular motions to encourage relaxation and stimulate blood flow.
- The warm oil was applied in long, sweeping strokes from the head down to the feet, focusing on the joints and muscles. Used firm pressure on tense areas and incorporated kneading or tapping for deeper muscle relief.
- The massage was done for 20-40 minutes and it is then followed by *Sarwang Swedan* from May 16, 2024.

Physiology

- Active compounds in *Bala* oil (alkaloids, flavonoids) penetrate the skin and reach deeper tissues (muscles, joints, fascia), enhancing absorption and supporting muscle and joint health.
- The warm oil and rhythmic massage stimulate vasodilation, increasing blood flow and promoting lymphatic drainage, aiding in detoxification, nutrient delivery, and waste removal.

- The combination of warm oil and pressure helps relax tight muscles and fascia, alleviating muscle stiffness. *Bala* oil also strengthens muscles, improves vitality, and promotes synovial fluid production, enhancing joint mobility and reducing inflammation and pain.
- *Bala* oil moisturizes and nourishes the skin, improving elasticity and texture. Its antioxidants protect from environmental stressors and promote skin regeneration.
- The massage activates the parasympathetic nervous system, reducing cortisol levels, relieving stress, and regulating neurotransmitters (serotonin, dopamine) to improve mood and emotional well-being.
- It neutralizes free radicals, reduces oxidative stress, supports cellular healing, and promotes faster recovery, slowing the aging process.

Mode of action

- Bioactive ingredients of *Bala* oil, such as alkaloids and flavonoids, are fat-soluble and penetrate the skin barrier effectively. These compounds enter the bloodstream and interact with deeper tissues, including muscles, joints, and connective tissue, enhancing therapeutic effects.
- The warm oil and rhythmic massage trigger the production of nitric oxide (NO), a molecule that dilates blood vessels. This enhances blood flow, ensuring tissues receive more oxygen, nutrients, and immune cells, which support repair and function.
- Increased circulation allows better nutrient and oxygen delivery to tissues, which are vital for cellular energy production and healing.
- The pressure applied during the massage activates the lymphatic system, helping to clear toxins, metabolic waste, and cellular debris. This enhances detoxification and supports the immune system.
- The massage also stimulates the lymphatic pump, which accelerates the flow of lymph fluid, improving the body's ability to eliminate toxins and waste.
- The anti-inflammatory compounds in *Bala* oil help reduce pro-inflammatory cytokines like TNF- α and IL-6, which decrease inflammation in muscles and joints. This helps alleviate conditions like joint stiffness, muscle soreness, and arthritis.

5. Chest and legs *Lepam* with *Dashmool* and *Dashanga*^[27]

Procedure

- Equal parts of *Dashmool* and *Dashanga* powders were mixed with water.
- The paste was applied to the chest and legs, starting from the chest and extending to the sides, upper back, and neck, and similarly on the legs, from the

thighs to the feet. Gentle circular motions were used to ensure even coverage.

- The *Ayurvedic* medicinal paste was left on the skin for 20-30 minutes.
- After the paste was rinsed off with warm water, the skin was dried, and a light moisturizer was applied.

Physiology

- The active ingredients in *Dashmool* and *Dashanga* are absorbed through the skin, reaching muscles and joints to promote healing and detoxification.
- The warm paste and massage improve blood flow, helping deliver nutrients and remove waste, reducing muscle soreness and promoting detoxification.
- The Medicines have anti-inflammatory and pain-relieving properties, reducing swelling and pain in muscles and joints.
- The massage helps relax tight muscles and ease tension in the connective tissue (fascia), improving flexibility and reducing stiffness.
- The paste nourishes and hydrates the skin, while also improving joint mobility by boosting lubrication and reducing joint pain.

Mode of action

- Lipophilic compounds in *Dashmool* and *Dashanga* are absorbed through the skin, entering the bloodstream and reaching target tissues like muscles, joints, and skin.
- These medicines inhibit NF- κ B, COX, and LOX enzymes, reducing pro-inflammatory cytokines (IL-1, IL-6, TNF- α) and preventing tissue damage.
- Active compounds interact with opioid receptors to enhance endorphin and enkephalin release, reducing pain transmission. Saponins and glycosides reduce calcium influx into nerve cells, lowering pain fiber excitability.
- Flavonoids and terpenoids stimulate nitric oxide (NO) production, promoting vasodilation and improving microcirculation, aiding in nutrient delivery and waste removal.

6. *Sarwang Swedan* with *Bala* oil^[28]

Procedure

- Warm *Bala* oil was applied to the entire body

with gentle, long strokes, focusing on joints, muscles, and pressure points.

- The massage lasts for 30-45 minutes, promoting circulation and relaxation.
- After the oil massage, the patient sits in the steam chamber or *Swedan* box for 10-15 minutes at a comfortable temperature.
- The patient rests for 20-30 minutes to cool down. A warm bath was taken to cleanse the skin and remove excess oil.
- This was followed by *Abhyangam* with *Bala* oil from May 16, 2024.

- The treatment stimulates the immune system, helping to clear toxins, fight infections, and support overall health and vitality.
- This treatment helps balance the *Vata* and *Pitta doshas* of body, reducing inflammation and preventing the buildup of toxins.

Physiology

- The warm *Bala* oil and steam therapy increase blood flow to the skin, muscles, and joints, helping to deliver nutrients and remove waste products more effectively.
- The steam opens the pores and encourages sweating, helping the body get rid of toxins and excess fluids, while also supporting lymphatic drainage to clear waste and improve immune function.
- *Bala* oil helps relax muscles and reduce tension by influencing muscle contractions. It eases pain and stiffness, improving flexibility and mobility.
- The combined massage and steam activate the parasympathetic nervous system, which reduces stress hormones, promotes calmness, and balances mood-regulating neurotransmitters.
- This hydrates and nourishes the skin, improving its softness and elasticity. It helps protect the skin from damage and supports skin repair through increased moisture and collagen production.

Mode of action

- Warm *Bala* oil and steam stimulate the Nitric Oxide (NO) pathway, leading to vasodilation and improved blood flow, enhancing nutrient delivery and waste removal in tissues.
- Sweating from the steam promotes toxin removal, while enhanced lymphatic drainage supports the elimination of metabolic waste and pathogens.
- Active compounds of *Bala* oil reduce muscle tension by modulating calcium ion flux and acetylcholine release, providing pain relief and improved flexibility.
- *Bala* oil inhibits COX, LOX, and NF- κ B pathways, reducing inflammation and protecting tissues from oxidative damage.
- *Bala* oil neutralizes reactive oxygen species (ROS), reducing oxidative stress and promoting skin regeneration and repair.
- The treatment enhances immune cell activity through improved circulation and lymphatic flow, boosting overall immune function.

The Ayurvedic medications taken during IPD are listed in Table 6. Details of medications advised during the IPD is mentioned in Table 7. Medications advised during the time of discharge is mentioned in Table 8

Table 6 Medications taken during the IPD

| Medicine name | Dosage | 14-May | 15-May | 16-May | 17-May | 18-May | 19-May | 20-May |
|---------------------|---|--------|--------|--------|--------|--------|--------|--------|
| GFR Powder | Half a teaspoon BD (<i>Adhobhakta</i> with <i>koshna jala</i>) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Chander Vati Tablet | 2 Tablets BD (<i>Adhobhakta</i> with <i>koshna jala</i>) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Asthiposhak Vati | 2 Tablets BD (<i>Adhobhakta</i> with <i>koshna jala</i>) | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

Table 7. Medications advised during IPD

| Medicine Name | Ingredients | Dosage | Therapeutic Effects |
|----------------------------|--|---|---|
| GFR Powder | Varun (<i>Crateva nurvala</i>), Punarnava (<i>Boerhavia diffusa</i>), Gokshur (<i>Tribulus terrestris</i>), Kaasni (<i>Cichorium intybus</i>), Bhumi Amla (<i>Phyllanthus niruri</i>), Shirish (<i>Albizia lebbek</i>), Shigru (<i>Moringa oleifera</i>), and Apamarg (<i>Achyranthes aspera</i>). | Half a teaspoon BD (<i>Adhobhakta with koshna jala</i>) | Supports kidney function and reduces inflammation, helping with renal symptoms. |
| Chander Vati Tablet | Kapoor Kachri (<i>Hedychium spicatum</i>), Vacha (<i>Acorus calamus</i>), Motha (<i>Cyperus rotundus</i>), Kalmegh (<i>Andrographis paniculata</i>), Giloy (<i>Tinospora cordifolia</i>), Devdaru (<i>Cedrus deodara</i>), Desi Haldi (<i>Curcuma longa</i>), Atees (<i>Aconitum heterophyllum</i>), Daru Haldi (<i>Berberis aristata</i>), Pipla Mool (<i>Piper longum</i> root), Chitraka (<i>Plumbago zeylanica</i>), Dhaniya (<i>Coriandrum sativum</i>), Harad (<i>Terminalia chebula</i>), Bahera (<i>Terminalia bellirica</i>), Amla (<i>Phyllanthus emblica</i>), Chavya (<i>Piper chaba</i>), Vayavidang (<i>Embelia ribes</i>), Pippal (<i>Piper longum</i>), Kalimirch (<i>Piper nigrum</i>), Sonth (<i>Zingiber officinale</i> dried ginger), Gaj Pipal (<i>Scindapsus officinalis</i>), Swarn Makshik Bhasma , Sajji Kshar , Senda Namak , Kala Namak , Choti elaichi (<i>Elettaria cardamomum</i> - small cardamom), Dalchini (<i>Cinnamomum verum</i>), Tejpatra (<i>Cinnamomum tamala</i>), Danti (<i>Baliospermum montanum</i>), Nishothra (<i>Operculina turpethum</i>), Banslochan , Loh Bhasam , Shilajit (<i>Asphaltum punjabianum</i>), Guggal (<i>Commiphora wightii</i>). | 2 tablets BD (<i>Adhobhakta with koshna jala</i>) | Improves urine outflow, boosts immunity, helps in cell rejuvenation, enhance digestion, boosts metabolism and cell rejuvenation |
| Asthiposhak | Godanti , Shudh Shilajit (<i>Asphaltum punjabianum</i>), Ashwagandha (<i>Withania somnifera</i>), Tabaqsheer (<i>Bambusa vulgaris</i>), Pippali (<i>Piper longum</i>), Amba Haldi (<i>Curcuma amada</i>), Hadjorh (<i>Cissampelos pareira</i>), Maida Saq. | 2 tablets BD (<i>Adhobakta with koshna jala</i>) | Enhances bone strength, supports healing, and reduces joint pain. |

Table 8. Medications advised after the discharge

| Medicine Name | Ingredients | Dosage | Therapeutic Effects |
|----------------------------|---|---|---|
| GFR Powder | Varun (<i>Crateva nurvala</i>), Punarnava (<i>Boerhavia diffusa</i>), Gokshur (<i>Tribulus terrestris</i>), Kaasni (<i>Cichorium intybus</i>), Bhumi Amla (<i>Phyllanthus niruri</i>), Shirish (<i>Albizia lebbek</i>), Shigru (<i>Moringa oleifera</i>) and Apamarg (<i>Achyranthes aspera</i>) | Half a teaspoon BD (<i>Adhobhakta with koshna jala</i>) | Supports kidney function and reduces inflammation, helping with renal symptoms. |
| CKD Tablet | Pashanbhed (<i>Bergenia ciliata</i>), Varun (<i>Crateva nurvala</i>), Punarnava (<i>Boerhavia diffusa</i>), Gokshur (<i>Tribulus terrestris</i>), Apamarg (<i>Achyranthes aspera</i>), Haldi (<i>Curcuma longa</i>), Charila (<i>Embelia ribes</i>), Kulthi (<i>Dolichos biflorus</i>), Harad (<i>Terminalia chebula</i>), Bhumiawla (<i>Pyrrosia piloselloides</i>), Giloy (<i>Tinospora cordifolia</i>), Shitalchini (<i>Vernonia cinerea</i>), Anantmool (<i>Hemidesmus indicus</i>), Khas (<i>Vetiveria zizanioides</i>), Yab Kshar (Alkaline substance, botanical origin unclear), Muli Kshar (<i>Raphanus sativus</i>), Kalmi Shora (Sodium bicarbonate), Sajji Kshar (Traditional alkaline substance, botanical origin unclear), Shilajit (<i>Asphaltum</i>), Hajral Yahud (<i>Silicon dioxide</i>), Shwet Parpati (Mercury-based preparation in Ayurvedic medicine). | 2 tablets BD (<i>Adhobhakta with koshna jala</i>) | Used for treating kidney disease, urinary tract infections (UTI), burning micturition, and supporting liver health. |
| Renal support syrup | Nimba (<i>Azadirachta indica</i>), Arjuna (<i>Terminalia arjuna</i>), Gokshura (<i>Tribulus terrestris</i>), Hareetaki (<i>Terminalia chebula</i>), Ashwagandha (<i>Withania somnifera</i>), Karanja (<i>Pongamia pinnata</i>), Chirayata (<i>Swertia chirayita</i>). | 20 ml BD (<i>Adhobhakta with koshna jala</i>) | Provide solution for kidney, bladder, urinary tract disease |
| Divya Shakti Powder | Trikatu , Triphala , Nagarmotha (<i>Cyperus rotundus</i>), Vay Vidang (<i>Embelia ribes</i>), Chhoti Elaichi (<i>Elettaria cardamomum</i>), Tej Patra (<i>Cinnamomum tamala</i>), Laung (<i>Syzygium aromaticum</i>), Nishoth (<i>Operculina turpethum</i>), Sendha Namak , Dhaniya (<i>Coriandrum sativum</i>), Pipla Mool (<i>Piper longum</i> root), Jeera (<i>Cuminum cyminum</i>), Nagkesar (<i>Mesua ferrea</i>), Amarvati (<i>Achyranthes aspera</i>), Anardana (<i>Punica granatum</i>), Badi Elaichi (<i>Amomum subulatum</i>), Hing (<i>Ferula assafoetida</i>), Kachnar (<i>Bauhinia variegata</i>), Ajmod (<i>Trachyspermum ammi</i>), Sazzikhar , Pushkarmool (<i>Inula racemosa</i>), Mishri (<i>Saccharum officinarum</i>). | Half a teaspoon HS (<i>Nishikala with koshna jala</i>) | Deepan, pachan and detoxification |

The patient returned for a follow-up on June 29, 2024, and was symptomatically improved. The medications advised after the follow up is mentioned in Table 9. The vitals

investigated prior to the visit on June 12, 2024 is mentioned in Table 4 which depicts the blood urea is noticeably reduced after discharge.

Table 9. Medications advised after the follow up on June 29, 2024.

| Medicine Name | Ingredients | Therapeutic effect | Dosage |
|---------------------|---|--|--|
| Ladies Tonic | Dashmoolaristha, Lodharasava, Patragasava, Kumariasava, Ashokaristha, Loasava | Supports <i>Stree Swasthya</i> (female wellness) and helps in <i>Vridhhi</i> (enhancing vitality and overall well-being). | 20ml BD (<i>Adhobhakta Samamatra</i> with <i>Koshnajala</i>) |
| Chander Vati | Kapoor Kachri (<i>Hedychium spicatum</i>), Vach (<i>Acorus calamus</i>), Motha (<i>Cyperus rotundus</i>), Giloy (<i>Tinospora cordifolia</i>), Devadaru (<i>Cedrus deodara</i>), Daru Haldi (<i>Curcuma longa</i>), Atees (<i>Aconitum Heterophyllum</i>), Piplamool (<i>Piper longum</i>), Amla (<i>Phyllanthus emblica</i>), Chitrak (<i>Plumbago Zeylancia</i>), Dhaniya (<i>Coriandrum sativum</i>), Haritaki (<i>Terminalia chebula</i>), Vayavidhang (<i>Embelia ribes</i>), Pippal (<i>Ficus religiosa</i>), Kalimirch (<i>Piper nigrum</i>), Sonth (<i>Zingiber officinale</i>), Gaj Pipal (<i>Scindapus Officinalis</i>), Swarn Makshik Bhasma, SajiKshar, Senda Namak, Kala Namak, Choti Elaichi (<i>Elettaria cardamomum</i>), Dalchini (<i>Cinnamomum verum</i>), Tejpatta (<i>Cinnamomum tamala</i>), Danti (<i>Baliospermum montanum</i>), Nisoth (<i>Operculina turpethum</i>), Banslochan (<i>Bambusa arundinacea</i>), Loh bhasma, Shilajeet (<i>Asphaltum punjabianum</i>), Guggul (<i>Commiphora wightii</i>) | It acts as a <i>Mutral Dravya</i> , helping in removing <i>Ama</i> (toxins) through <i>Mutravaha Srotas</i> by increasing <i>Mutravaha Pravritti</i> (urine flow). | 2 Tablet BD (<i>Adhobhakta</i> with <i>Koshnajala</i>) |
| Samavati | Gokshura (<i>Tribulus Terrestris</i>), Shatavari (<i>Asparagus racemosus</i>), Kaunch (<i>Mucuna pruriens</i>), Amalaki (<i>Emblica officinalis</i>), Shunthi (<i>Zingiber officinale</i>), Jaiphal (<i>Myristica fragrans</i>), Ashwagandha (<i>Withania somnifera</i>), Vidarikand (<i>Pueraria tuberosa</i>), Beej band lal (<i>Sida cordifolia</i>), Akarkara (<i>Anacyclus pyrethrum</i>), Talmakhana (<i>Asteracantha longifolia</i>), Musli (<i>Chlorophytum borivilianum</i>), Swarn makshik, Shilajit (<i>Asphaltum punjabicum</i>) | Supports <i>Yakrit Vikar Shaman</i> (Liver Disorder Management), enhances <i>Agni Deepan-Pachan</i> (Appetite and Digestion Stimulation), aids in <i>Vibandh Nivarana</i> (Constipation Relief), boosts <i>Vyadhikshamatva</i> (Immunity), and helps in <i>Aruchi Shaman</i> (Loss of Appetite Management) | 2 Tablet BD (<i>Adhobhakta</i> with <i>Koshnajala</i>) |

| | | | |
|-------------------|---|--|---|
| GFR Powder | Varun (<i>Crateva nurvala</i>), Punarnava (<i>Boerhavia diffusa</i>), Gokshur (<i>Tribulus terrestris</i>), Kaasni (<i>Cichorium intybus</i>), Bhumi Amla (<i>Phyllanthus niruri</i>), Shirish (<i>Albizia lebbek</i>), Shigru (<i>Moringa oleifera</i>), Apamarg (<i>Achyranthes aspera</i>) | Supports <i>Vrikk Karya</i> (works) and acts as <i>Shotha</i> (Inflammation) <i>har</i> , helping alleviate renal symptoms | ½ tsp BD (<i>Adhobhakta</i> with <i>Koshnajala</i>) |
| Fe Capsule | Makoy (<i>Solanum nigrum</i>), Shilajeet (<i>Asphaltum punjabianum</i>), Yashad Bhasam , Swarn Makshik Bhasam , Mukta Shukti Pishti | Boosts Iron Levels (<i>Rakta Vardhana</i>) and improves Energy (<i>Balya Rasayana</i> , <i>Ojovardhana</i>) | 2 Capsule BD (<i>Adhobhakta</i> with <i>Koshnajala</i>) |

Patient reported relief from periorbital swelling, pain in lower limb and fungal infection. There was no shortness of breath on exertion during the follow up on June 29, 2024.

RESULT

Effectiveness of Ayurvedic Treatments: After 7 days of IPD, the patient experienced noteworthy development in symptoms, which denotes the interventions used in the study are effective against CKD with hypertension. The graphical representation of the vitals is mentioned in Fig 1. Also the relief from the shortness of breath during exertion, pain in lower limb and periorbital swelling shows that the *Ayurvedic* interventions used in the case study are effective for CKD. The pain scoring during the IPD is showed in Table 10. The condition of patient before and after treatment is mentioned in Table 11.

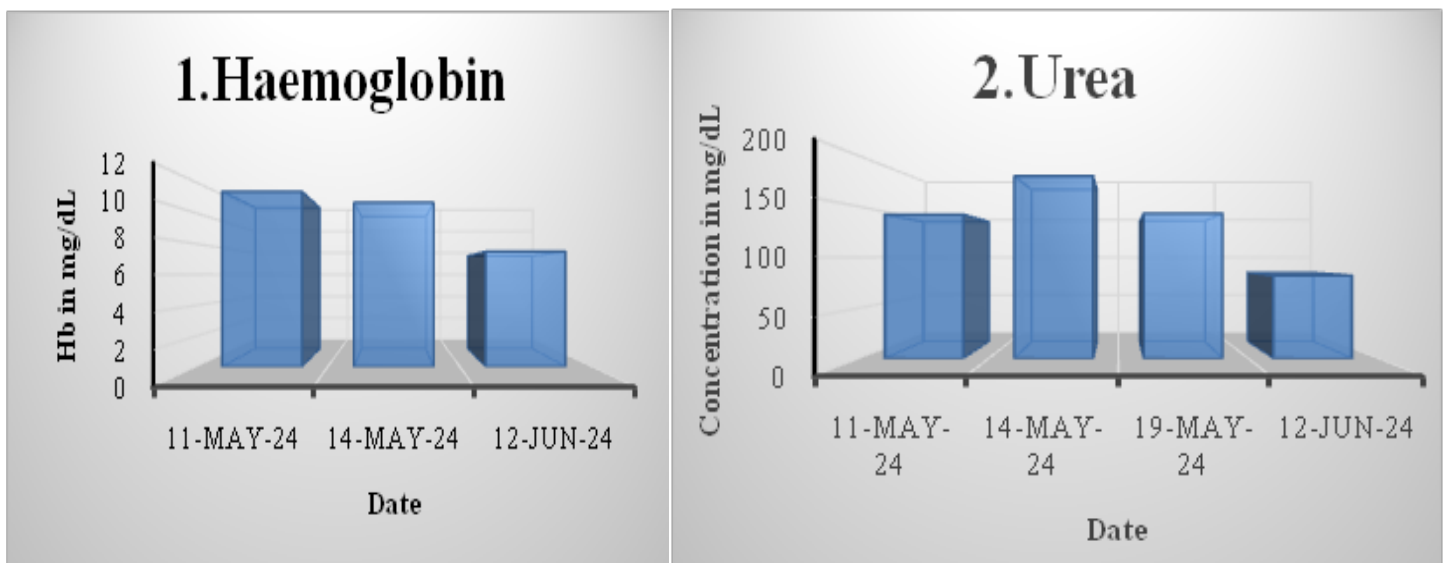
Table 11. Pain scoring during the IPD (0 to 10 degree)

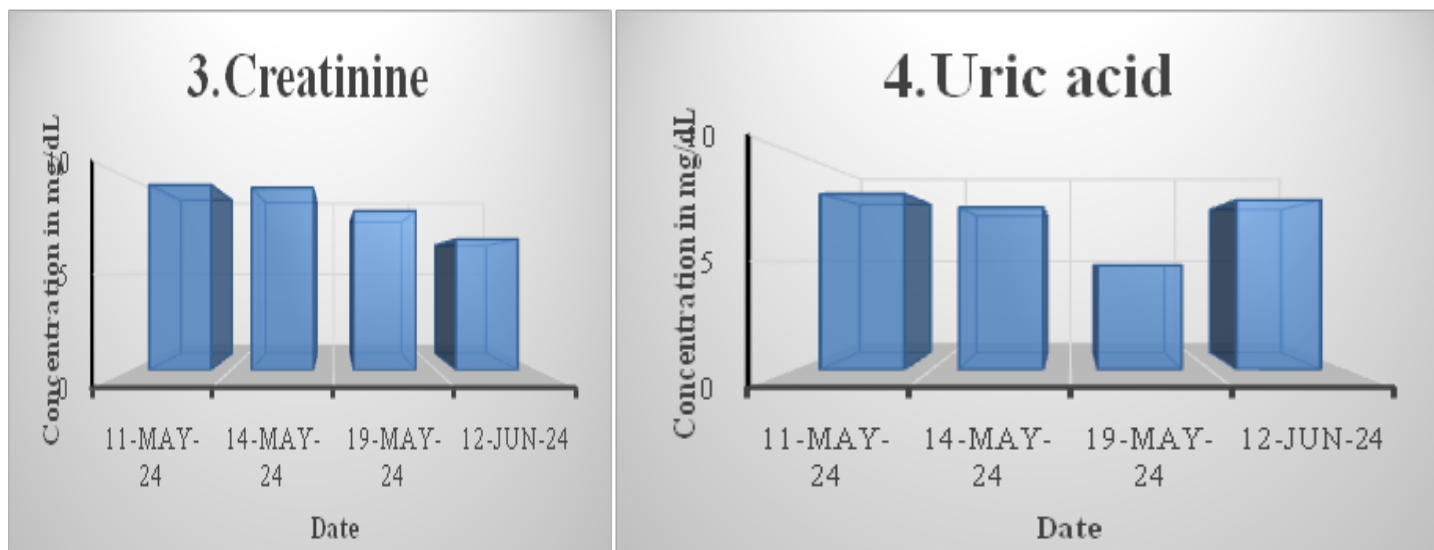
| Date | Pain scoring chart (0 to 10) | |
|------------|------------------------------|---------------|
| | Before therapy | After therapy |
| 14-05-2024 | 1 | 1 |
| 15-05-2024 | 1 | 1 |
| 16-05-2024 | 2 | 1 |
| 17-05-2024 | 2 | 1 |
| 18-05-2024 | 1 | 1 |
| 19-05-2024 | 2 | 1 |
| 20-05-2024 | 1 | — |

Table 12. The condition of patient before and after treatment

| Condition before treatment | Condition after treatment |
|--|---------------------------|
| Periorbital swelling | Relief |
| Pain in lower limb | Relief |
| Mild SOB on exertion | No SOB |
| Fungal infection/ ring worm between thighs | Better |

Fig.1 Graphical representation of the assessment of the patient’s vital signs.



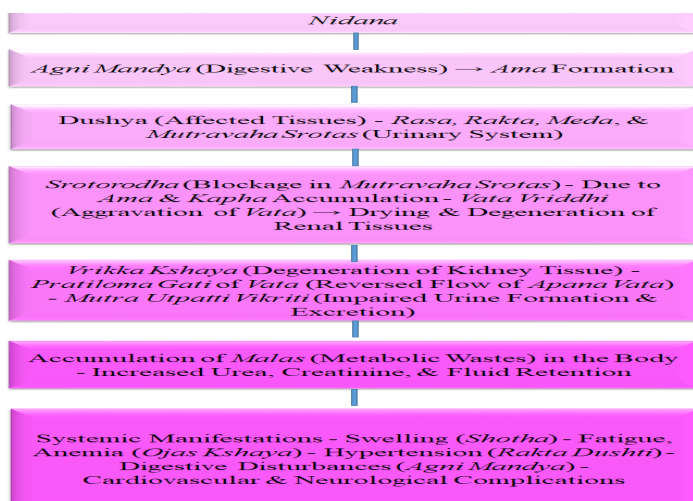


Future Research perspectives: This study was conducted on a 30 years old female patient with CKD and hypertension. The results of this case study was promising but an ardent evaluation and examination is needed because this study only involves one patient. Studies with larger number of randomized controlled trials are required to confirm the reliability, efficacy and safety of the integrated Ayurveda therapies used in this study for CKD to establish a standard protocol and guidelines for the clinical settings.

DISCUSSION

Managing CKD with integrated *Ayurvedic* interventions for the treatment of CKD assures a promising alternative for conventionally practicing expensive treatment methods. This case report is about the procedure of combining *Ayurvedic* therapies and medications with conventional medications in a 31-year-old female, diagnosed with CKD for 2 years and hypertension for 6 months. The patient was on MHD twice a week, but not continuing dialysis during the visit. The patient presented symptoms such as periorbital swelling, pain in lower limb, mild shortness in breath and fungal/ringworm infection between thighs. The *samprapti* [29] of this case study is mentioned in Fig 2.

Fig 2 Samprapti of this case study



The patient underwent IPD treatment for 7 days. The *Ayurveda* treatment involved following Panchakarma procedures:

Awagah Swedan: This therapy involved immersing a patient in warm, medicated water at 42°C to induce sweating. It enhanced blood flow, toxin elimination, and absorption of medicinal properties. The therapy was discontinued on May 16, 2024. It promoted hyperthermia, increasing aerobic metabolism, oxygen demand, and fluid-electrolyte balance.

Matra Basti with Gokshuradi and Punarnavadi: A medicated decoction or oil prepared from Gokshura and Punarnava roots was administered rectally to improve kidney function, detoxification, and hormonal balance. Gokshura promoted diuresis and hormone production, while Punarnava enhanced GFR, modulated immune responses, and supported adrenal and pituitary function.

Shiropichu with Brahmi Oil: *Brahmi* oil, infused with *Bacopa monnieri*, was applied to the crown area with a warm cotton cloth for 20-30 minutes. The therapy enhanced scalp penetration, delivering bacosides for anti-inflammatory, antioxidant, and neurogenic effects. It improved memory, focus, mood, and reduced stress by activating the parasympathetic nervous system and balancing neurotransmitters.

Abhyangam with Bala Oil: This warm oil massage stimulated blood flow, relaxation, and muscle relief through circular kneading techniques. *Bala* oil nourished the skin, reduced oxidative stress, and supported cellular healing. The therapy activated nitric oxide production, improved circulation, and regulated cortisol levels for stress reduction.

Chest and Legs Lepam with Dashmool and Dashanga: Medicinal paste was applied to the chest and legs for 20-30 minutes to reduce pain, inflammation, and muscle tension. The active ingredients promoted lymphatic drainage,

endorphin release, and skin hydration while inhibiting inflammatory cytokines.

Sarwang Swedan with Bala Oil: A combination of warm oil massage and steam therapy enhanced circulation, detoxification, and relaxation. It balanced *Vata* and *Pitta doshas*, reduced inflammation, and supported immune function, while *Bala* oil improved skin hydration and elasticity.

The *Ayurvedic* treatment protocol for this case included *Ayurvedic* medicines such as GFR Powder, Chander Vati Tablet, Asthiposhak Vati, CKD Tablet, Renal support syrup, Divya Shakti Powder, Ladies tonic, FE Capsule and Sama vati, along with *Panchakarma* therapies. These interventions were intended to improve kidney health, alleviate symptoms and overall wellbeing for a female patient. The patient reported significant relief from key symptoms like periorbital swelling, lower limb pain and shortness of breath, which were also reflected in the vital sign investigations. GFR Powder supports kidney health, detoxification, and fluid balance with key ingredients like *Kasni*, *Gokshura*, and *Punarnava*. Chander Vati Tablet enhances digestion, immunity, and detoxification, providing antioxidants for improved gut health. Asthiposhak Vati strengthens bones, reduces osteoporosis risks, and improves flexibility with ingredients like *Gaodanti*, *Shilajeet*, and *Ashwagandha*. CKD Tablet supports kidney function, helps dissolve stones, and reduces inflammation with *Pashanbhed*, *Varun*, and *Giloy*. Renal Support Syrup enhances kidney function and detoxification with a blend of *Nimba*, *Arjuna*, and *Ashwagandha*. Divya Shakti Powder boosts nerve health, immunity, and circulation with *Dalchini*. Ladies Tonic is an *Ayurveda* formulation designed to support women's well-being, enriched with Aloe Vera and *Sonth*. FE Capsule improves hemoglobin levels, immunity, and skin health with *Shilajeet* and *Loh Bhasma*. Lastly, Sama Vati helps reduce anxiety and stress while enhancing cognitive function with *Ashwagandha* and *Shatavari*.

This case study suggests that combining *Ayurvedic* interventions with conventional treatments offers a promising alternative for managing CKD. Given that advanced diagnostic and treatment options for CKD are often inaccessible to many individuals, *Ayurvedic* therapies provide a more affordable and accessible option. These treatments not only help alleviate symptoms but also address underlying imbalances in the body, promoting improved renal health and overall well-being. While the results are encouraging, particularly for CKD associated with hypertension, further research and clinical trials are needed to standardize *Ayurvedic* treatment protocols and establish their efficacy in CKD management.

CONCLUSION

The following conclusions can be drawn from this case study on treating CKD with hypertension using *Ayurvedic* interventions:

Symptoms: At the time of admission, the patient presented with symptoms such as periorbital swelling, lower limb pain, and mild shortness of breath upon exertion, along with a fungal/ringworm infection between the thighs. After 7 days of inpatient treatment followed by *Ayurvedic* care, the patient showed significant improvement. The periorbital swelling and limb pain subsided, and no new symptoms were reported, indicating notable improvement in kidney function and overall well-being.

Vitals: Blood pressure fluctuated during IPD but seems reduced to 120/80 mmHg during discharge. The weight of the patient was maintained at 37 kg, which reflects the healthy lifestyle and diet changes.

Investigations: Laboratory tests conducted during the treatment period represented the overall health improvement. The Serum urea levels decreased from 142 mg/dL to 82 mg/dL during regular follow-ups, indicating enhanced kidney function. The serum creatinine level also reduced from 9.66mg/dL to 6.82mg/dL. These investigation supports the reliability of *Ayurvedic* treatment methods for CKD.

This study concludes that the use of *Ayurvedic* therapies alongside previously prescribed allopathic treatments for CKD showed favorable results, including symptom relief, better vital signs, and improved laboratory test outcomes. This approach appears to enhance kidney function and overall patient health. However, further studies with larger, controlled trials are needed to validate these findings and establish standardized treatment protocols.

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