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Ayurvedic Management of Chronic Renal Failure (CRF) - A Case Report.

Vivekaradhya M^{1*}, Prakash Paltye² and Madhu Ranjan³

¹⁻³Department of Panchakarma, Ashwini Ayurvedic Medical College and Hospital, Tumkur, Karnataka, India

ABSTRACT

Chronic Renal Failure (CRF) is a syndrome characterized by progressive and irreversible deterioration of renal function due to slow destruction of renal parenchyma eventually terminating in death when significant numbers of nephrons have been destroyed. In CRF the choice of available treatment in the conventional system of medicine includes hemodialysis, nutritional supplement and renal transplantation, which is economically burden to the CRF patients in India.

In this regard *Ayurveda* provides an effective management of the disease by incorporating Ayurvedic drugs, dietary and lifestyle interventions. CRF can be understood as a *Mutravaha Sroto Vikara* as per the principles of *Ayurveda*. Here we are reporting a case of CRF of a 35 year old female patient who was managed successfully with Ayurvedic formulations like Gokshuradi Guggulu, Chandraprabha Vati, Punarnavasam, Neeri KFT. The prognosis was found to be effective and safe.

KEYWORDS

Chronic Renal Failure (CRF), Hemodialysis, Mutravaha-Sroto Vikara, Gokshuradi Guggulu, Neeri KFT.



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INTRODUCTION

Chronic Renal Failure (CRF) is a syndrome characterized by progressive and irreversible deterioration of renal function due to slow destruction of renal parenchyma eventually terminating in death when significant numbers of nephrons have been destroyed¹. Chronic Kidney Disease affected 753 million people globally in 2016, 417 million females and 336 million males². The three most common causes of CRF are Diabetes Mellitus, Hypertension, and Glomerulonephritis³. Often, it is diagnosed as a result of screening of people known to be at risk of kidney problems, such as those with high blood pressure or diabetes and those with a blood relative with renal disorders.

This initially manifests only as a biochemical abnormality. CRF is considered when Glomerular Filtration Rate (GFR) falls below 30ml/min. In early CRF, the patient is often asymptomatic. Renal failure may present as a raised blood urea and creatinine often accompanied by Hypertension, Proteinuria, Hyperkalemia, Hypocalcemia, Hyperuricaemia or anemia⁴. Clinical symptoms include metabolic acidosis (Kussmauls breathing), decreased urine production, nausea,

anorexia, pedal edema, vomiting, muscular twitching etc⁵.

In CRF the choice of available treatment in the conventional system of medicine includes Hemodialysis⁶, nutritional supplement which is not satisfactory and ultimate goal is to Renal Transplantation, which is economically burden to the CRF patients in India⁷. In this regard *Ayurveda* provides an effective management of the disease by incorporating Ayurvedic drugs, dietary and lifestyle inventions. CRF can be understood as a *Mutravaha Sroto Vikara* as per the principles of *Ayurveda*. All the *tridoshas* and all the *dushyas* are involved in the disease. Morbid changes in the *srotas* due to accumulation of vitiated *doshas* may cause *sangha* (Blockage) which can lead to *karyahaani* of *mutravaha srotas* (decreased renal functions).

Involvement of *dushyas* can be understood by the analysis of clinical signs and symptoms. Fluid and electrolyte imbalance, cardiovascular complications can be taken as *Rasadusti*. Anemia, bleeding tendency, nausea can be caused by *Raktadusti*. Myopathy due to *mamsadusti*, dislipidemia due to involvement of *medas*, osteodystrophy due to *asthidusti*, neuropathy due to *majja* and *snayu* involvement. Sexual dysfunction, loss of libido indicated *Sukradusti*. *Mutra*, *sweda* and *udaka* are commonly affected in CRF.



Based on the *dosha*, *dushya*, and *adhistana* along with the *rogabala* and *rogibala* ayurvedic management can be planned in order to increase the quality of life of the patient and to postpone or avoid the dialysis and renal transplant. Here we are reporting a case of CRF of a 35 year old female patient who was managed successfully with Ayurvedic Treatment along with dietary and lifestyle interventions.

CASE REPORT

A female patient aged 35years came to Panchakarma OPD in Ashwini Ayurvedic Medical College and Hospital, Tumkur, Karnataka with the complaints of bilateral pedal edema, puffiness of face, shortness of breathing, decreased urine output, nausea, anorexia, muscle twitching since 6 months. She was a k/c/o HTN since 5years. She had consulted Fortis Hospital Bengaluru, where she consulted a nephrologist and during routine investigations her serum creatinine was very high along with electrolyte imbalance. She was diagnosed with CRF and was advised with diuretics and other medications. In the next follow up she was advised to undergo dialysis. She underwent dialysis for 2times but didn't find relief from her complaints. Then she decided to take Ayurvedic treatment.

Chief complaints: Bilateral pedal edema, puffiness of face, shortness of breathing,

decreased urine output, anorexia, nausea, muscle twitching since 6 months.

Physical Examination

General condition: Ill looking

Blood Pressure: 160/100 mmhg

Pulse: 98 bpm

Temp: 98.4 F

Built: Moderate

Weight: 62 Kg

Height: 5 feet 4 inches

Respiratory Rate: 22 cycles/min

Pallor: + +

Icterus: Absent

Clubbing: Absent

Cyanosis: Absent

Lymph nodes: Not palpable

Edema: b/l pedal pitting edema, periorbital, face.

Personal History

Appetite: Reduced

Bowel: Constipated

Micturition: reduced frequency

Sleep: Disturbed

Diet: Mixed

Habits: No addictions

Menstrual History

Normal & Regular

No abnormal bleeding or discharge.

Systemic Examination

CNS: Well oriented to place, person and time. Intact Higher mental functions. No sensory deficits.



CVS: S1 S2 heard, HR: 98bpm, No murmurs heard.

RS: b/l symmetrical air entry. b/l basal mild crepitation heard.

P/A: soft, non-tender, no organomegaly.

Investigations done during first visit:

(18/12/2017)

Hb: 9.8 gm/dl (decreased)

TLC: 6,800 cells/cumm

DC: N-49%, L-41%, E-6%, M-4%, B-0%

ESR: 45 mm/hr (raised)

Platelet Count: 3.09 lakh/cumm

RBC count: 3.86 millions/cumm

P.C.V: 38% (decreased)

M.C.V: 86 fl

M.C.H: 28 pg

M.C.H.C: 32%

RBS: 132.0 mg/dl

Serum Creatinine: 8.1 mg/dl (raised)

Serum Electrolytes:

Na: 141.2 mEq/L (reduced)

K: 3.91 mEq/L

Cl: 105.5 mEq/L

Urine Examination:

Urine Sugar: Nil

Urine Albumin: Present +

Pus cells: 2-3 cells/hpf

Epithelial cells: 3-4 cells/hpf

RBCs: Absent.

Treatment History: Has taken a course of Antibiotics, Diuretics. On regular medications for Hypertension. Underwent Dialysis for 2 times.

METHODOLOGY

Treatment Given:

After thorough physical and systemic examination along with laboratory investigations, the treatment was planned.

The treatment given is detailed in Table 1.

Table 1 Treatment plan for every follow up

First Visit: 04/12/2017			
Sl. No	Formulation	Dose (For 15 days)	Anupana
1	Syp Neeri KFT	10ml-0-10ml b/f	Ushna Jala
2	Gokshuradi Guggulu	2-0-2 a/f	Ushna Jala
3	Punarnavasam	20ml-0-30ml a/f	Ushna Jala
4	Cap Nefpro	0-2-0 a/f	Ushna Jala
Second Visit: 19/12/2017			
Sl. No	Formulation	Dose (For 30 days)	Anupana
1	Syp Neeri KFT	10ml-0-10ml b/f	Ushna Jala
2	Gokshuradi Guggulu	2-0-2 a/f	Ushna Jala
3	Punarnavasam	15ml-0-15ml a/f	Ushna Jala
4	Tab Chandraprabha Vati	0-2-0 a/f	Ushna Jala
Third Visit: 03/02/2018			
Sl. No	Formulation	Dose (For 30 days)	Anupana
1	Syp Neeri KFT	10ml-0-10ml b/f	Ushna Jala
2	Gokshuradi Guggulu	2-0-2 a/f	Ushna Jala
3	Punarnavasam	15ml-0-15ml a/f	Ushna Jala
4	Tab Chandraprabha Vati	0-2-0 a/f	Ushna Jala
5	Tab Abhra loha	1-0-1 a/f	Ushna Jala



Fourth Visit: 22/03/2018			
Sl. No	Formulation	Dose (For 30 days)	Anupana
1	Syp Neeri KFT	10ml-0-10ml b/f	Ushna Jala
2	Gokshuradi Guggulu	1-0-1 a/f	Ushna Jala
3	Punarnavasam	20ml-0-20ml a/f	Ushna Jala
4	Tab Chandraprabha Vati	0-2-0 a/f	Ushna Jala
5	Tab Abhra loha	1-0-1 a/f	Ushna Jala
Fifth Visit: 21/06/2018			
Sl. No	Formulation	Dose (For 30 days)	Anupana
1	Syp Neeri KFT	10ml-0-0 b/f	Ushna Jala
2	Gokshuradi Guggulu	1-0-1 a/f	Ushna Jala
3	Punarnavasam	0-0-20ml a/f	Ushna Jala
4	Tab Chandraprabha Vati	0-2-0 a/f	Ushna Jala
5	Tab Abhra loha	1-0-1 a/f	Ushna Jala

Diet

Patient was advised to take light food, fresh coriander juice, and restricted water intake according to the 24hour urine output.

Patient was advised to restrict salty, spicy, heavy and oily food items, protein rich food (Pulses). Patient was advised to avoid day sleep and suppression of natural urges.

RESULTS

There was gradual improvement in the patient's general conditions and symptoms during the course of treatment and she was exempted from dialysis. The assessment of the signs and symptoms before, during and after treatment is tabulated in Table No 2.

Table 2 Assessment of signs and symptoms before and after treatment.

Signs and Symptoms	First Visit 04/12/2017	Second Visit 19/12/2017	Third Visit 03/02/2018	Fourth Visit 22/03/2018	Fifth Visit 06/03/2019
Decreased urine production	++	++	+	+	-
Pedal edema	++	++	+	-	-
Puffiness of face	++	++	+	-	-
Shortness of breath	++	+	+	-	-
Anorexia	++	+	-	-	-
Nausea	+	-	-	-	-
Muscle twitching	++	+	-	-	-

The Laboratory findings are listed in Table No 3.

Table 3 Assessment of laboratory findings before and after treatment.

Laboratory Test	25/11/2017	18/12/2017	03/01/2018	02/02/2018	19/06/2018	25/01/2019
Hb %		9.8 g/dl	10.2 g/dl	10.7 g/dl	12.4 g/dl	
Serum Creatinine	9.40 mg/dl	8.1 mg/dl	5.2 mg/dl	3.3 mg/dl	2.50 mg/dl	1.5 mg/dl
Serum Sodium	130 mmol/L	141.2 mmol/L				
Serum Potassium	3.63 mmol/L	3.9 mmol/L			3.69 mmol/L	



Serum Chloride	88 mmol/L	105.5 mmol/L			
ESR		45 mm/hr	30 mm/hr	28 mm/hr	
Urine Sugar	Absent	Absent	Absent	Absent	Absent
Urine Albumin	Present +	Present +	Present +	Traces	Absent
Urine RBC	10-15 cells/hpf	Absent	Absent	Absent	
Urine Epithelial cells	3-5 cells/hpf	2-3 cells/hpf	2-3 cells/hpf	4-5 cells/hpf	

The serum creatinine levels before and after treatment is shown in Figure No 1 and Figure No 2 respectively.

PATIENT NAME : P LALITHA
PATIENT ID : FH01.757472
ACCESSION NO : 0081QK013124
DRAWN : 25/11/2017 06:24
CLIENT NAME : FHSL BG ROAD - IPD
IPID: 204818
IPD-L6 WARD NS 1

CLIENT PATIENT ID : UHID:757472
AGE : 35 Years
SEX : Female
DATE OF BIRTH :
RECEIVED : 25/11/2017 06:30
REPORTED : 25/11/2017 08:50
REFERRING DOCTOR : DR. RAJANNA SREEDHARA

CLINICAL INFORMATION :

Test Report Status	Preliminary	Results	Biological Reference Interval	Units
BIO CHEMISTRY				
CREATININE, SERUM		RESULT PENDING		
CREATININE		9.40	0.50 - 0.90	mg/dL
ELECTROLYTES (NA/K/CL), SERUM				
SODIUM		130	Low 136 - 145	mmol/L
METHOD : ISE INDIRECT				
POTASSIUM		3.63	3.5 - 5.1	mmol/L
METHOD : ISE INDIRECT				
CHLORIDE		88	Low 98 - 107	mmol/L


Test Method(s)
ELECTROLYTES (NA/K/CL), SERUM-
 Sodium levels are increased in dehydration, cushing's syndrome, aldosteronism & decreased in Addison's disease, hypopituitarism, liver disease. Hypokalemia (low K) is common in vomiting, diarrhea, alcoholism, folic acid deficiency and primary aldosteronism. Hyperkalemia may be seen in end-stage renal failure, hemolysis, trauma, Addison's disease, metabolic acidosis, acute starvation, dehydration, and with rapid K infusion. Chloride is increased in dehydration, renal tubular acidosis (hyperchloremia metabolic acidosis), acute renal failure, metabolic acidosis associated with prolonged diarrhea and loss of sodium bicarbonate, diabetes insipidus, adrenocortical hyperfunction, salicylate intoxication and with excessive infusion of isotonic saline or extremely high dietary intake of salt. Chloride is decreased in overhydration, chronic respiratory acidosis, salt-losing nephritis, metabolic alkalosis, congestive heart failure, Addisonian crisis, certain types of metabolic acidosis, persistent gastric secretion and prolonged vomiting.

****End Of Report****
 Please visit www.srlworld.com for related Test Information for this accession

Dr. Manjula S J, MD
 Senior pathologist and Lab Head

Figure 1 Showing the Serum creatinine levels before treatment.



 **ಶ್ರೀ ಮಾರುತಿ ಡಯಗ್ನೋಸ್ಟಿಕ್ಸ್ ಲ್ಯಾಬೋರೇಟರಿ**
SRI MARUTHI DIAGNOSTIC LABORATORY
Kalpatharu Road, Mallasandra, TUMKUR-572 107.

Lab. No : 33/19 Date: 25/01/2019 Age : 38 Years Sex : Female
Name : Mrs.Lalitha. Ref. By : Dr.Mohan.

BIO- CHEMISTRY REPORT

PARAMETER **OBSERVED VALUE** **REFERENCE RANGE**

RENAL FANCTION TEST-1

Blood Urea	38.0 mg/dl	15-40 mg/dl
Serum Creatinine	1.5 mg/dl	0.7-1.2 mg/dl

.....END OF REPORT.....


Lab Technologist


BIOCHEMIST


Lab Technologist
SM Diagnostic Laboratory
Mallasandra

 **SRI MARUTHI DIAGNOSTIC LABORATORY**
Kalpatharu Road, Mallasandra, TUMKUR-572 107.

Figure 2 Showing the Serum creatinine levels after treatment



The improvement in Serum Creatinine levels is depicted in the form graph on Figure No 3.

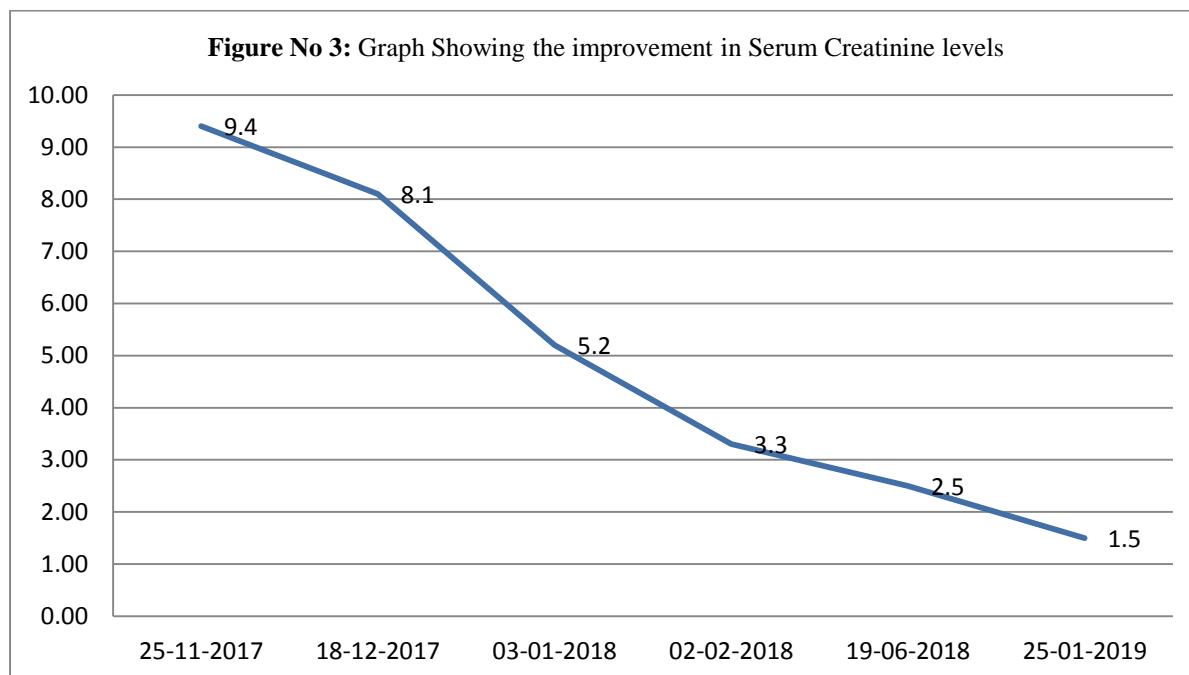


Figure 3 Graph Showing the improvement in Serum Creatinine levels

DISCUSSION

CRF is a progressive loss of renal functions over a period of months or years. CRF can be considered as a *Mutravahasroto vikara* based on its *lakshana*, *doshas*, and *dushyas* involved. In Ayurveda there is no direct relation and description of this disease in ancient texts. But increase in creatinine levels can be considered as indicator of *Mutravahastrotas Dusti*. As the *Vruka* is made from *Rakta* and *Meda* so in this disease decrease filtration rate has been occurred due to accumulation of *Meda* and *Rakta Dusti* which is carried out by *Vata Dosh*⁸.

Here in this case the patient initially took conventional treatment and did not find satisfactory improvements. And we observed that given Ayurvedic medicines considerably reduced the signs and symptoms of the patient. There was marked improvement in the serum creatinine levels, electrolytes and the Hb levels. This was probably due the reno-protective and nephron-genetic effect of the drugs like *Punarnava*^{9,10} and *Gokshura*, which was the major part of this treatment plan.

*Gokshuradi guggulu*¹¹, the chief ingredient *Gokshura* has diuretic action which is beneficial in CRF to decrease the oliguria. *Rasayana* properties of *Gokshura* and *Chandraprabha Vati* help to prevent and



repair the tissue damage of *Mutravahasrotas* by their antioxidative properties. *Guggulu* which has the *Rasayana and Lekhana*¹² property will remove the blockage of the *Mutravaha srotas*

*Punarnavasam*¹³: *Punarnava* has fibrinolytic activity, smooth muscle relaxant property¹⁴. Helps in improving the glomerular filtration rate also removing waste out of body which damages the

kidney. Neeri KFT Syrup of AIMIL pharma also contains *Punarnava* and *Gokshura*. All these drugs together will remove the blockage, enhances the quality and repairs the damage of renal parenchyma thereby increasing the functioning capacity by increasing the GFR. The ingredients of *Gokshuradi Guggulu*, *Punarnavasam*, *Neeri KFT*¹⁵ are listed in Table No 4, 5, 6 respectively.

Table 4 Ingredients of *Gokshuradi Guggulu*

SI No.	Sanskrit Name	Botanical Name	Quantity
1	<i>Shudda Guggulu</i>	Commiphora mukul	336 Grams
Kashaya Dravyas			
2	<i>Gokshura</i>	Tribulus terrestris	1.34 Kgs
3	<i>Jala</i>	Water	8.06 litres
Churna Dravyas			
4	<i>Shunti</i>	Zingiber officinalis	48 grams
5	<i>Maricha</i>	Piper nigrum	48 grams
6	<i>Pippali</i>	Piper longum	48 grams
7	<i>Haritaki</i>	Terminallia chebula	48 grams
8	<i>Vibitaki</i>	Terminallia belerica	48 grams
9	<i>Amalaki</i>	Embila officinalis	48 grams
10	<i>Musta</i>	Cyperus rotundus	48 grams

Table 5 Ingredients of *Punarnavasam*

SI No.	Sanskrit Name	Botanical Name	Quantity
1	<i>Pippali</i>	Piper longum	16 grams
2	<i>Shunti</i>	Zingiber officinalis	16grams
3	<i>Maricha</i>	Piper nigrum	16 grams
4	<i>Darvi</i>	Berberis aristata	16 grams
5	<i>Haritaki</i>	Terminallia chebula	16 grams
6	<i>Vibitaki</i>	Terminallia belerica	16 grams
7	<i>Amalaki</i>	Embila officinalis	16 grams
8	<i>Vasaka</i>	Adhatoda vasica	16 grams
9	<i>Erandamoola</i>	Ricinis communis	16 grams
10	<i>Katuki</i>	Picrorhiza kurroa	16 grams
11	<i>Punarnava</i>	Boerhavia diffusa	16 grams
12	<i>Gokshura</i>	Tribulus terrestris	16 grams
13	<i>Kantakari</i>	Solanum xanthocarpum	16 grams
14	<i>Bruhati</i>	Solanum indicum	16 grams
15	<i>Gajapippali</i>	Scindapsus officinalis	16 grams
16	<i>Shushka moolaka</i>	Raphanus sativus	16 grams
17	<i>Duralabha</i>	Fagonia cretica	16 grams
18	<i>Nimba</i>	Azadirachta indica	16 grams
19	<i>Guduchi</i>	Tinospora cordifolia	16 grams



20	<i>Patola</i>	<i>Trichosanthes dioica</i>	16 grams
21	<i>Dhataki</i>	<i>Woodfordia fruticosa</i>	256 grams
22	<i>Madhu</i>	Honey	800 grams
23	<i>Draksha</i>	<i>Vitis vinifera</i>	320 grams
24	<i>Sharkara</i>	Sugar	1.6 kgs
25	<i>Jala</i>	Water	8.1 litres

Table 6 Ingredients of Neeri KFT Syrup for each 10ml

Sl No.	Sanskrit Name	Botanical Name	Quantity
Aqueous extracts derived from:			
1	Punarnava	<i>Boerhaavia diffusa</i>	1000 mg
2	Panchtrin Mool	Classical Ay. Preparation	1000 mg
3	Kasni	<i>Cichorium intybus</i>	600mg
4	<i>Kakamachi</i>	<i>Solanum nigrum</i>	500mg
5	<i>Guduchi</i>	<i>Tinospora cordifolia</i>	500 mg
6	<i>Kamala nala</i>	<i>Nelumbo nucifera</i>	400 mg
7	<i>Palasha</i>	<i>Butea monosperma</i>	300 mg
8	<i>Gokshura</i>	<i>Tribulus terrestris</i>	300 mg
9	<i>Kamala</i>	<i>Nelumbo nucifera</i>	200 mg
10	<i>Shirisha</i>	<i>Albizzia lebbeck</i>	200 mg
11	<i>Rakthachandana</i>	<i>Pterocarpus santalinus</i>	200 mg
12	<i>Haridra</i>	<i>Curcuma longa</i>	200 mg
13	<i>Shigru</i>	<i>Moringa oleifera</i>	200 mg
14	<i>Ushira</i>	<i>Vetiveria zizanioides</i>	150 mg
15	<i>Ananthamoola</i>	<i>Hemidesmus indicus</i>	150 mg
16	<i>Dhanyaka</i>	<i>Coriandrum sativum</i>	100 mg
17	<i>Varuna</i>	<i>Crataeva nurvala</i>	100 mg
18	<i>Tanduliyaka</i>	<i>Amaranthus spinosus</i>	100 mg
19	<i>Amlavetasa</i>	<i>Rheum emodi</i>	100 mg
20	<i>Eravu</i>	<i>Cucumis utilissimus</i>	100 mg
21	<i>Eranda Karkati(Pappaya)</i>	<i>Carica papaya</i>	50 mg
Infusion:			
22	<i>Kankola</i>	<i>Piper cubeba</i>	100 mg
Juice of:			
23	<i>Ananas (Pineapple)</i>	<i>Ananas comosus</i>	0.5 ml
24	<i>Alabhu</i>	<i>Lagenaria siceraria</i>	0.5 ml
25	<i>Dhanyaka</i>	<i>Coriandrum sativum</i>	0.5 ml
26	<i>Amalaki</i>	<i>Embila officinalis</i>	0.5 ml
Powder:			
27	<i>Shwetha Parpati</i>	Classical Ay. Preparation	100mg
28	Sugar free syp base		Q.S
29	Excipients		Q.S

The Hb levels were improved due to the use of *Abhraloha*. *Abhraloha* also acts as cardioprotective and cardiotonic. Thus we can say that the given Ayurvedic drugs are effective in the management of CRF and completely safe. With such therapeutic

management we can avoid hemodialysis, further damage of renal parenchyma and renal transplantation.

CONCLUSION

In this case study there was marked improvement in the renal function and



general condition of the patient by administration of the above said ayurvedic formulations. Improvement in the serum creatinine, serum electrolytes, Hb percentage, Urine albumin levels were observed during the study. So from this we can conclude that the above said treatment is effective, cost-effective and safe in the management of CRF and can further reduce the requirement of dialysis and renal transplantation. It provides lead to further such large sample studies based on scientific parameters.



REFERENCES

1. Harsh Mohan. (2010). Textbook of Pathology, 6th edition. Jaypee Publications, Newdelhi; p654.
2. Bikbow B, Pericon, Remuzzi G (23rd May 2018), Disparties in chronic kidney diseases prevalence among males & females in 195 countries: Analysis of the global burden of disease 2016 study. *Nephron*, 139(4), 313-318. PMID29791905
3. www.en.m.wikipedia.org/wiki/chronic_kidney_disease (Last accessed on 03/11/2019).
4. Stanley Davidson. (2010), Davidson's principles and practice of medicine, 21st edition. Churchill livin stone publications. p 433.
5. Harsh Mohan. (2010). Textbook of Pathology, 6th edition. Jaypee Publications, Newdelhi; p655.
6. Stanley Davidson. (2010), Davidson's principles and practice of medicine, 21st edition. Churchill livin stone publications. p 435.
7. Umesh Khanna. (2009 Jan), The Economics of Dialysis in India. *Indian K Nephrol*, 19(1): 1-4. PMID20352002
8. Ananthram Sharma. (2012), Sushruta Samhitha, Vol 2 (Sharirasthana 4th chapter Shloka no 31). Chaukhambha Sanskrit Sansthan, Varanasi, p-55.
9. Singh, R.G. et al. (2010), Evaluation of antiproteinuric & renoprotective effect of punarnava (*Boerhavia diffusa* Linn) in diabetic nephropathy. *J Res Edu Indian medicine*; 16(1-2): 45-48.
10. Prasanth GS et al. (Apr 2010), A clinical comparative study of the management of chronic renal failure with punarnavadi compound. *Ayu*; 31(2): 185-92.
11. Srikanta Murthy K R. (2003), A Treatise on Ayurveda Sharanghadara Samhitha, (Madhyamakhandha 7/84-87). Chaukhambha Orientalia Varanasi, p 109.
12. Sharma A P, Sharma G. (1979), Kaiyadeva Nighantu (Aushada varga 1418), Chaukhambha Orientalia Varanasi, p14-15.
13. Muralidhar Mishra. (1945), Bhaishajya Ratnavali 3rd edition, Shotha Prakarana. Nethakumar Press, Lucknow. P176.
14. Pranati Nayak, M Thirunavoukkarasu. (2016 Mar). A review of the plant *Boerhaavia diffusa*: its chemistry, pharmacology and therapeutical potential. *JPHYTO* 5(2):83-92.
15. <https://www.aimilpharmaceuticals.com/product/neeri-kft>. (Last Accessed on 04/11/2019).