"PRE AND POST-HEMODIALYSIS COAGULATION PROFILE IN CHRONIC KIDNEY DISEASE PATIENTS – A ONE YEAR CROSS SECTIONAL STUDY AT TERTIARY CARE CENTRE"

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Sub: Institutional Ethical Clearance for the study.

With reference to the above, we wish to inform you that your proposed research project titled **"PRE-AND POST-HEMODIALYSIS COAGULATION PROFILE IN CHRONIC KIDNEY DISEASES PATIENTS – A ONE YEAR CROSS SECTIONAL STUDY AT TERTIARY CARE CENTRE",** is ethical and justifiable. The proposed research project has been cleared by the JNMC Institutional Ethics Committee on Human Subjects Research.

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ABBREVIATIONS

APTT	ACTIVATED PARTIAL THROMBOPLASTIN CLOTTING TIME
AVFS	ARTERIOVENOUS FISTULAS
CKD	CHRONIC KIDNEY DISEASE
CLD	CHRONIC LIVER DISEASE
CRRT	CONTINUOUS RENAL REPLACEMENT THERAPY
EDTA	ETHYLENEDIAMINETETRAACETIC ACID
ESRD	END-STAGE RENAL DISEASE
GFR	GLOMERULAR FILTRATION RATE
HD	HEMODIALYSIS
INR	INTERNALTIONAL NORMALISED RATIO
KDIGO	KIDNEY DISEASE IMPROVING GLOBAL OUTCOMES
KDOQI	KIDNEY DISEASE OUTCOMES QUALITY INITIATIVE
NKF	NATIONAL KIDNEY FOUNDATION
PD	PERITONEAL DIALYSIS
PT	PROTHROMBIN TIME
RRT	RENAL REPLACEMENT THERAPY

ABSTRACT

Background: Chronic kidney disease (CKD) is a global public health problem. Patients with end-stage renal illness are at a higher risk for bleeding, which can manifest as anything from small incidents like bruising and bleeding at the sites of venepuncture to menorrhagia and gastrointestinal blood loss. Present study aimed to assess the changes in the coagulation profile among the chronic kidney disease patients undergoing hemodialysis, coagulation profile measured and analyzed pre and post dialysis.

Material & Method: Present cross-sectional study was conducted in CKD patients undergoing hemodialysis, admitted in wards and hemodialysis unit at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi. The patients more than 18 years with CKD were enrolled in the study after obtaining the informed consent. CKD patients who are known to have coagulation disorders, malignancy, pregnancy, recent blood or platelet transfusion, CLD, hemorrhagic disorder or lactating mothers were excluded from the study. 5 ml of venous blood was collected in 2 different vacutainer containing sodium citrate for coagulation profile (PT, aPTT) and EDTA for platelet count Pre and Post Hemodialysis. Data of Coagulation profile was collected and analyzed using statistical software R version 4.2.1. and Microsoft Excel, with p-value of <0.05 was considered statistically significant.

Results: There were 50 patients participated in the study, with a mean age of 53.48 ± 13 years, with male preponderance of 58% (29) patients compared to a female of 42% (21). In post-dialysis patients, there is statistically significant greater mean levels of PT, INR, aPTT and lower mean levels of platelets. ($p<0.05$)

Conclusion: Study demonstrated the alteration in the coagulation profile after hemodialysis in CKD patients.

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INTRODUCTION

Chronic kidney disease (CKD) is a significant, chronic, non-communicable epidemic disease that affects people all over the world, including India, and is a worldwide public health issue[1,2]. It is defined by an irreversible decline in renal function, which is caused by less effective renal tissue functioning. As a result, the excretory, metabolic, and endocrine functions of the kidney are impaired, which results in the development of the clinical syndrome of uremia.[3]

Patients with end-stage renal illness have a higher risk of bleeding, which has been reported to include everything from menorrhagia and gastrointestinal blood loss to relatively modest occurrences like bruising and bleeding at venepuncture sites. Bleeding diathesis is caused by alterations in the morphology of blood vessels, anaemia, thrombocytopenia, uraemic disturbance of platelet adhesion and aggregation, coagulation, fibrinolysis, and an elevated risk of venous thromboembolism in patients with end-stage renal illness affecting Platelet count, PT, and aPTT.[4,5] Bleeding can have a severe negative impact on morbidity and mortality. This abnormality gets exacerbated post dialysis due to addition of anticoagulant like heparin and also after coming in contact with the dialyser membrane and the timely intervention prevents the morbidity and death.

Aim of this study is to assess the coagulation profile pre- and post-dialysis in CKD patients particularly PT, INR, aPTT and Platelets to reduce the risk of bleeding, modify heparin doses, access the effectiveness of the care, and forecast the possibility of complications.

AIMS & OBJECTIVES

Aim: To Study the changes in Coagulation Profile, Pre- and Post-Hemodialysis in Chronic Kidney Diseases Patients.

Objectives: Measure and compare the changes in Coagulation Profile, Pre- and Post-Hemodialysis in Chronic Kidney Diseases Patients.

REVIEW OF LITERATURE

Chronic kidney disease

"Chronic kidney disease (CKD) is defined by the presence of kidney damage or decreased kidney function for three or more months, irrespective of the cause."

Incidence

Several factors like high percentage of patients living below the poverty line, a low gross domestic product, and insufficient funding for healthcare, contribute to the high prevalence of CKD in India. Because of access issues, more than 50% of advanced CKD patients are identified when their eGFR is below 15ml/min/1.73m^2.[6] The importance of comprehensive screening programs for those at risk for CKD is highlighted by this worrying statistic. Statistics from the Kidney Disease Data Centre Study of the International Society of Nephrology most recently showed 17% prevalence. The reported prevalence of CKD varies by region and ranges from 1% to 13%. CKD of Undetermined Etiology (CKDu), a chronic interstitial nephropathy with slow onset and sluggish progression, is prevalent in Andhra Pradesh, Odisha, and Goa.[8]

Chronic kidney disease

National Kidney Foundation (NKF) Kidney Disease Outcomes Quality Initiative (KDOQI) was introduced in 2002.[21–23] and later adopted by Kidney Disease Improving Global Outcomes (KDIGO) international guideline group in 2012.

Table 3.1- KDIGO Definition and Criteria:[24]

<table>
<tr><td colspan="2">Definition- Chronic kidney disease is defined based on the presence of either kidney damage or decreased kidney function for three or more months, irrespective of cause.</td></tr>
<tr><td colspan="2">Duration ≥3 months, based on documentation or inference</td></tr>
<tr><td colspan="2">Glomerular filtration rate (GFR) <60 mL/min/1.73 m^2</td></tr>
<tr><td colspan="2">Kidney damage, as defined by structural abnormalities or functional abnormalities other than decreased GFR includes the pathological abnormalities in the native or transplanted kidney. The damage can be identified in many patients with presence of any of one of the following clinical markers;
• Albuminuria
• Urinary sediment abnormalities
• Imaging abnormalities
• Pathologic abnormalities
• Kidney transplantation</td></tr>
<tr><td>Criteria[24]</td><td>Comment</td></tr>
<tr><td>≥3 months, based on documentation or inference</td><td>Duration is necessary to distinguish chronic from acute kidney diseases.
▪ Clinical evaluation can often suggest duration
▪ Documentation of duration is usually not available in epidemiologic studies</td></tr>
<tr><td>GFR <60 mL/min/1.73 m^2</td><td>GFR is the finest overall index of kidney function in health and disease.
▪ The average GFR for young people is around 125 mL/min/1.73 m2;
▪ GFR <15 mL/min per 1.73 m^2 is called as kidney failure.</td></tr>
</table>

	Two formulas are used widely to estimate kidney Function from serum creatinine[24] 1. The Cockcroft and Gault formula C_{Cr}={((140–age) x weight)/(72xS_{Cr})}x 0.85 (if female) 2. MDRD: eGFR = 175 x (SCr)-1.154 x (age)-0.203 x 0.742 [if female] x 1.212 [if Black]
Kidney damage, defined by structural or functional abnormalities other than reduced GFR	Causes based on pathology and underlying illness- Pathologic and structural abnormalities like ▪ Glomerular causes (diabetes, drugs, systemic infections, neoplasia, autoimmune diseases) ▪ Vascular causes (atherosclerosis, ischemia, thrombotic microangiopathy, hypertension, vasculitis) ▪ Tubulointerstitial causes (UTI, stones, drug toxicity, obstruction) ▪ Cystic causes (polycystic kidney disease)
	Albuminuria is a characteristic of kidney injury due to increased glomerular permeability, Normal urine albumin/creatinine ratio- (uACR< 30 mg/g) * ▪ uACR 10-29 mg/g – Normal to Mildly increased ▪ uACR 30-300 mg/g - Moderately increased ▪ uACR >300 mg/g - Severely increased ▪ uACR >2200 mg/g - Nephrotic Range. ▪ Depending on urine concentration, the threshold value roughly equates to trace or 1+ results on a urine dipstick.
	Urinary sediment abnormalities characteristic of kidney damage, for example: ▪ RBC casts – Proliferative glomerulonephritis ▪ WBC casts- Pyelonephritis or interstitial nephritis ▪ Oval fat bodies or fatty casts in diseases with proteinuria ▪ Granular casts and renal tubular epithelial cells in many parenchymal diseases (non-specific)

	Imaging abnormalities as indicators of kidney damage like ultrasound, computed tomography and magnetic resonance imaging with or without contrast, isotope scans and angiography, are performed in following diseases- ▪ Small and echogenic kidneys (common in later stages of CKD due to many parenchymal diseases) ▪ Polycystic kidneys ▪ Renal artery stenosis ▪ Hydronephrosis due to obstruction ▪ Cortical scarring due to infarcts, pyelonephritis or vesicoureteral reflux ▪ Renal masses or enlarged kidneys due to infiltrative diseases

Staging of CKD[24]

The goal of CKD staging is to help with management. Risk stratification is used to determine the optimal therapies, monitoring and patient education.

KDIGO Classification of CKD

- Cause of disease
- GFR categories
- Albuminuria categories

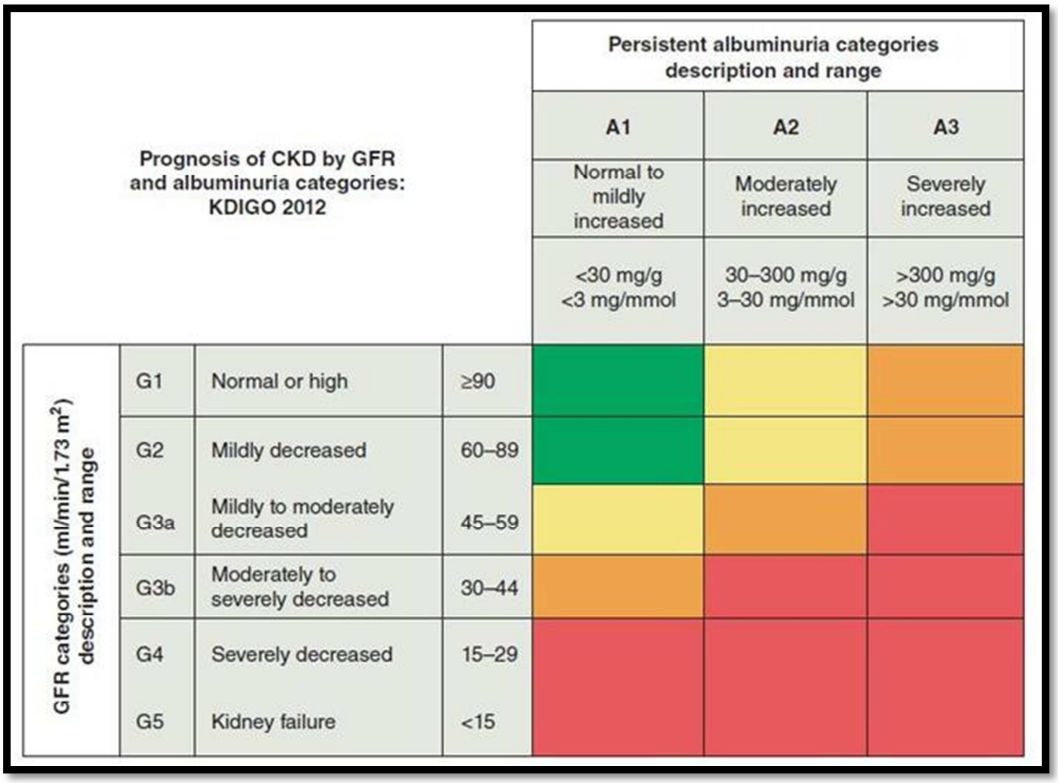
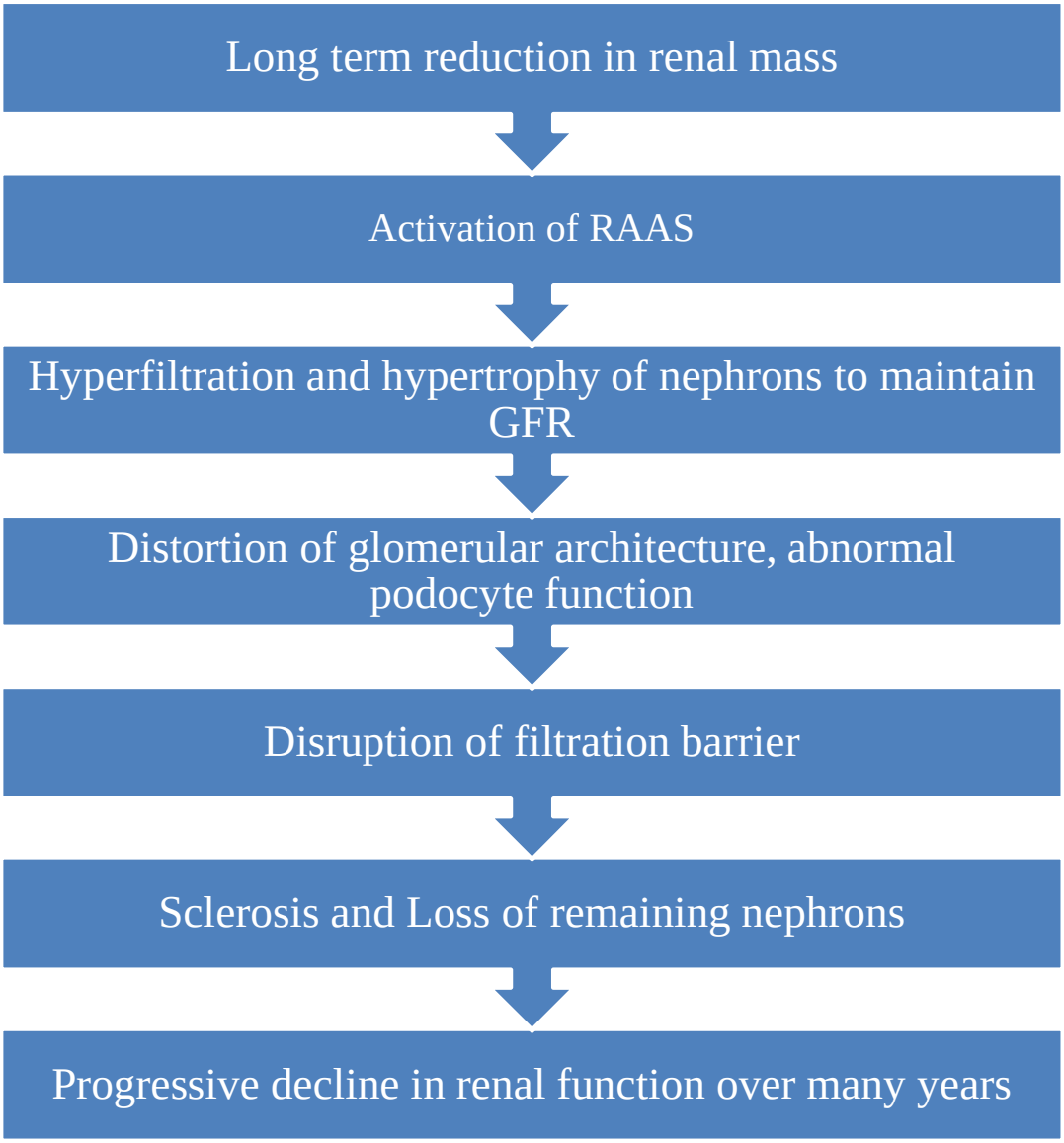


Figure 3.1: Showing the KDIGO Classification of CKD. As the risk and severity of chronic kidney disease increase, the colour scale change

PATHOPHYSIOLOGY OF CKD



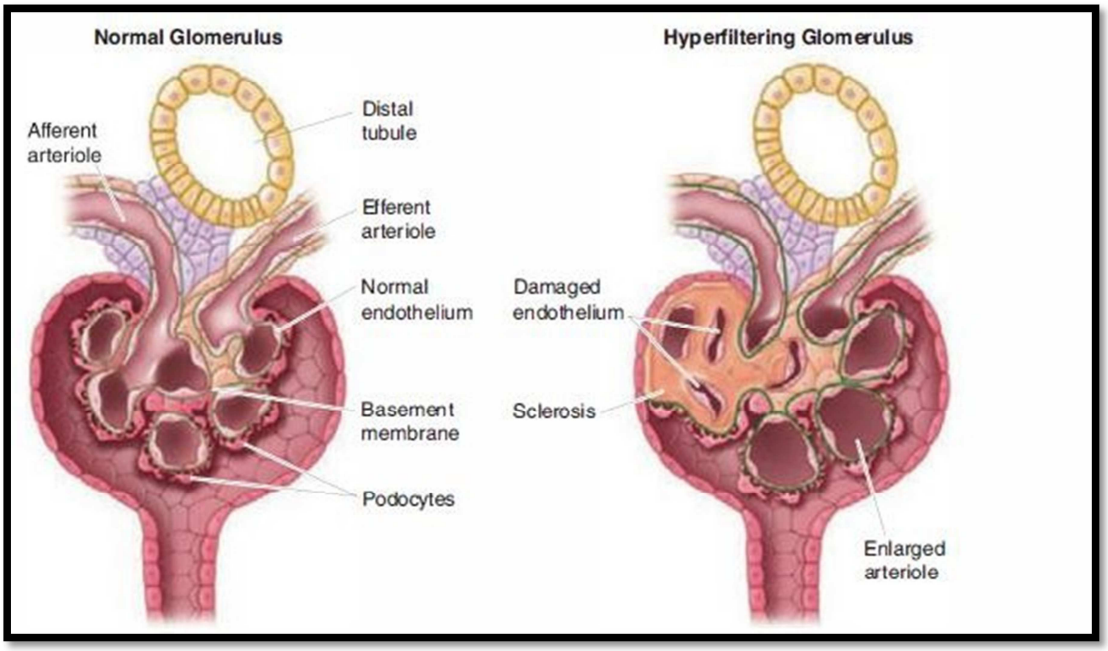


Figure 3.2 Left: Schema of the normal glomerular architecture. Right: Secondary glomerular changes associated with reduction in nephron number, including enlargement of capillary lumens and focal adhesions, which are thought to occur consequent to compensatory hyperfiltration and hypertrophy in remaining nephrons.

UREMIA –

Azotemia is a term used for retention of nitrogenous waste products. Uremia is a clinical condition due to multiorgan system derangement in advanced stages of renal insufficiency and is caused by nitrogen containing non-volatile products of metabolism normally excreted by kidney.

Manifestations of uremia:

1. **Nervous system:** Headache, malaise, insomnia, fatigue and cramps, Restless legs, Motor weakness, polyneuritis, Irritability, dementia, drowsiness, Flapping tremors, Convulsion, Stupor.
2. **Gastrointestinal system**: Anorexia, vomiting, gastritis, gastrointestinal ulcer with bleeding, pancreatitis.
3. **Cardiovascular system**: Pericarditis, hypertension, hypotension, cardiomyopathy, decreased diastolic- compliance, edema, atheromatosis, cardiomyopathy.
4. **Hematological system:** Anemia, thrombocytopenia, bleeding manifestations.
5. **Pulmonary system:** Pleuritis, uremic lung, pulmonary edema.
6. **Skin:** Pruritus, retarded wound healing, melanosis, nail atrophy.
7. **Bone disease:** Osteodystrophy, hyperparathyroidism, osteomalacia, adynamicbone disease.
8. **Others:** Thirst, weight loss, impotence, uremic fetor, hypothermia.

Broadly three types of dialysis

- Hemodialysis (HD)
- Peritoneal dialysis (PD)
- Continuous renal replacement therapy (CRRT)

Initiation of hemodialysis:

- Uremic encephalopathy,
- Acute kidney injury,
- Hypovolemia causing end-organ problems,

- Peripheral neuropathy,
- Life-threatening hyperkalemia,
- Pericarditis,
- Refractory acidosis,
- Failure to thrive and malnutrition,
- Toxic drug use
- Hypervolemia

Due to vasodilation, cardiac depression, and immunosuppression brought on by the above mentioned situations, end organs are damaged, hemodynamic instability develops, or renal recovery is postponed. They also result in dysregulated cytokines and inadequate clearance. When there are high cytokine levels, like in sepsis, RRT improves cytokine clearance after hemodialysis. During HD Electrolyte imbalances, intra-dialytic hypotension, and catheter complications can all be harmful.[25,27] The Kidney Disease Outcomes Quality Initiative (KDOQI) of the National Kidney Foundation has published the 2015 update of its hemodialysis adequacy criteria.[27]

Contraindications

Inability to secure vascular access is an absolute contraindication to hemodialysis, while other relative contraindications may include:

- Difficult vascular access
- Cardiac failure
- Fear of needles
- Coagulopathy

Modern methods are used to enhance the creation and maintenance of vascular access in patients with severe vascular disease. Patients with severe coagulopathy affects the extracorporeal circuit's anticoagulation treatment.

Preparation

Preparation actions and their results are responsible for 25 percent of hospital admissions for chronic uremia. A distal AV fistula is the gold standard.[28] AV fistula is created by connecting the vein and artery by two approaches as;

- End to side anastomosis
- Side to side approach

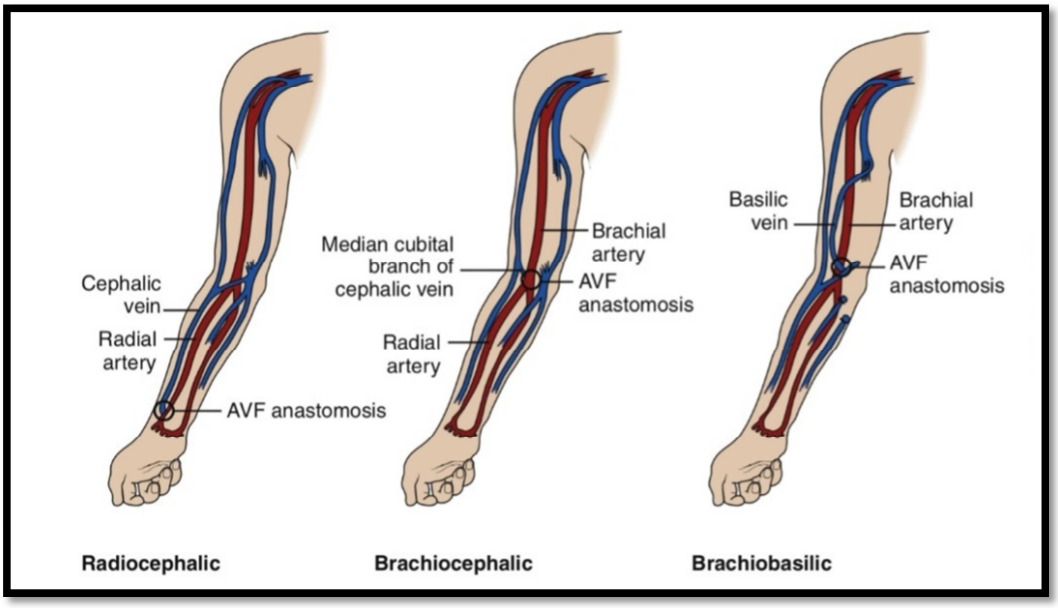


Figure 3.3- Type of AV Fistula

Arteriovenous grafts are indicated when there are no suitable veins for an AV fistula.

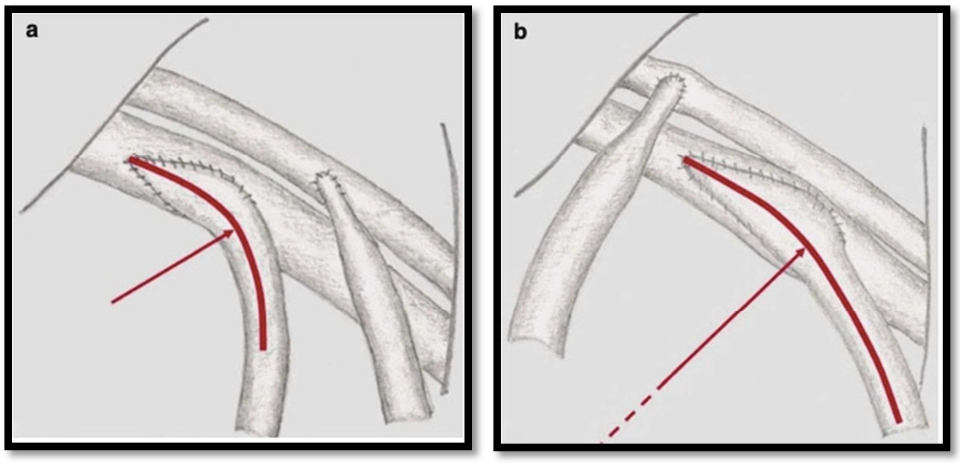


Figure 3.4 - (a) Subclavian loop with a narrow inflow radius of the graft into the vein. (b) Wide inflow radius

Once a patient's superficial veins have been used up, possibilities include synthetic grafts and tunnelled central venous catheters. The current suggested strategy is to only permanently catheterize chronic hemodialysis patients who have exhausted their peripheral vascular bed

Hemodialysis

The purpose of the HD system is to carry blood from the patient in a safe way to the dialyzer, facilitate the effective removal of uremic toxins and extra fluid, and return the cleared blood to the patient. The extracorporeal blood circuit, the dialyzer, the hemodialysis machine, and the water filtration system are the key elements of the dialysis system.

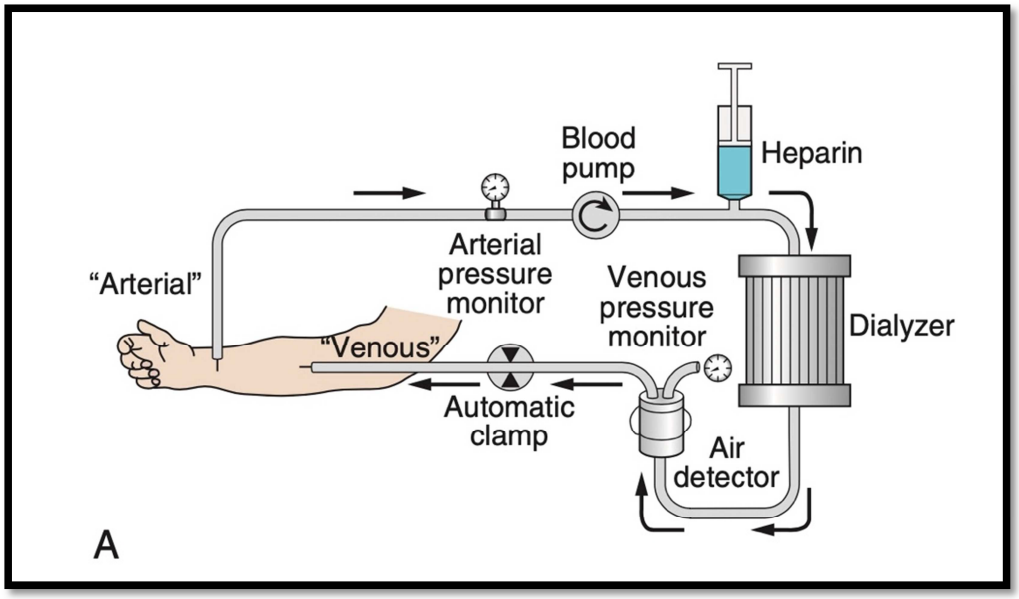


Figure 3.5- Blood circuit for hemodialysis.

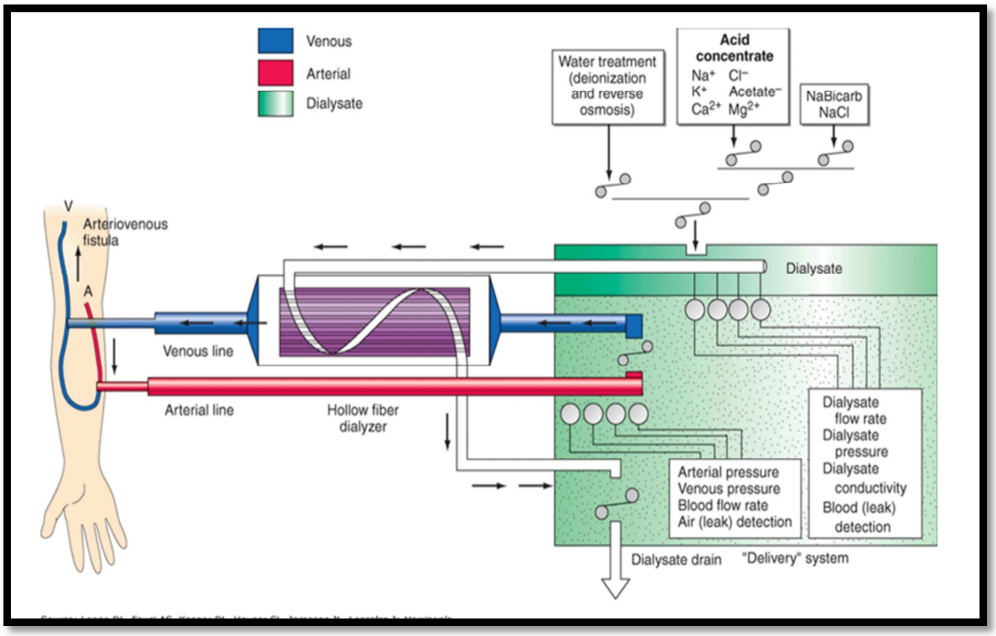


Figure 3.6- Components of hemodialysis

The dialyzer: It's a plastic container. A hollow fibre dialyzer is a type of dialysis machine that is extensively used. It is made up of bundles of capillary tubes, and blood flows on the exterior of the fibre bundle.

The dialysis: The potassium concentrates ranges from 0.4mmol/l to 2.5meq/lit on average. In hypocalcemia patients with secondary hyperparathyroidism, higher calcium concentrations are utilised. The sodium content is between 136 and 140 mmol/l.

Blood delivery system: Made up of an extracorporeal circuit and a dialysis access. The blood flow rate ranges from 250 to 500ml/min. The most typical type of dialysis access is a native fistula, which is created when an artery and vein are anastomosed end to end (for example, in the Brescia-Cimino fistula).

Dialysate is made by mixing highly purified water with salt, potassium, magnesium, calcium, bicarbonate, chloride, and dextrose. It lacks the low-molecular-weight waste products found in uremic blood. When uremic blood and dialysate are separated by a semipermeable barrier, waste solute flux from blood to dialysate outpaces back-flux from dialysate to blood. The concentrations of permeable waste products in the dialysate and blood gradually equalise if there is no further net removal of waste materials.

Heparin-free dialysis: It is the method of choice in patients who are actively bleeding, who are at high risk of bleeding, or in whom the use of heparin is contraindicated, as in patients with pericarditis, coagulopathy, recent surgery or intracerebral hemorrage. Heparin rinse is used to avoid giving the patient systemic heparin, the extracorporeal circuit should be filled with either the patient's blood or

unheparinized saline at the beginning of dialysis to enable the heparin-containing priming fluid to drain. High blood flow rate is used to prevent coagulation, if contraindicated due to the risk of disequilibrium, small surface area dialyzer can be used. Periodic saline rinse allows inspection of a hollow-fiber dialyzer with clot formation for evidence of clotting and to allow for timely discontinuation of treatment or changing of the dialyzer. Also, periodic saline rinsing may on its own reduce the propensity for dialyzer clotting or interfere. Using the above method of heparin-free dialysis, complete clotting of the dialyzer occurs in approximately 5% of cases—an acceptable risk that more than balances the danger of bleeding associated with heparin administration to high-risk patients. The risk of subsequent clotting can be reduced by increasing the frequency of flushes, limiting duration of dialyzer use, maximizing the blood flow rates, and avoiding blood product transfusion or lipid administration during the treatment.

Complications associated with hemodialysis: The list of complications related to modern hemodialysis methods is led by cardiovascular issues. Cardiovascular disorders have a risk of symptomatic intradialytic hypotension varies between 20% to 50%. The risk of arrhythmias which is predicted between 50% to 75%, is another cause for concern. With 27% of all instances, atrial fibrillation is the second most common kind of arrhythmia. 62 percent of fatal cardiac events are caused by sudden cardiac death, which is typically brought on by arrhythmias. When it comes to analysis of sudden cardiac deaths, which is 93 of 1000 patients in the first year of hemodialysis.[33,34]

The hemodialysis is associated with some complications like-

- Muscle cramps
- Hypotension
- Dialysis disequilibrium syndrome
- Dialyzer reactions
- Hemolysis
- Air embolism
- Others

Complications associated with hemodialysis instrument

- Membrane
- Hemodialysis device
- Vascular access
- Water system

Due to high mortality and a higher chance of regional wall motion anomalies during dialysis, sometimes known as cardiac stunning, intra-dialytic hypotension has a poor long-term outcome. The strongest link to fatality is a nadir systolic blood pressure of less than 90 mmHg, usually it shows up as nausea, light-headedness, dizziness, or other minor symptoms. In order to swiftly administer a 100 mL bolus of normal saline through the blood line, the patient is kept in the Trendelenburg position. Limit the amount of ultrafiltration being performed and keep an eye on the patient's vital signs until they have stabilised.

There is no known cause for muscle cramping. Hypotension, a high ultrafiltration rate, hypovolemia, and a low-sodium dialysis solution can make cramps worse due to vasoconstriction and muscle hypoperfusion.[25,35]

The most common time for patients to have dialysis disequilibrium syndrome is during or soon after their initial course of therapy. It is a clinical disorder characterised by neurologic decline, restlessness, confusion, headache, sporadic twitching of the muscles, and coma. It develops as a result of a sizable gradient between the blood and CSF urea concentrations, which allows water to enter the central nervous system (CNS) and raise intracranial pressure. Patients receiving fast dialysis are more likely to experience seizures and cerebral edema. With a URR of 0.4, a reasonable goal for urea concentration reduction is 40% in two hours. The gradient might not form if an osmotic agent is added to the blood. The usual additions include sodium, mannitol, high glucose dialysate, and glycerol. adjusting the sodium concentration of the dialysate[36,37]

Dyspnea, increased body and local temperature at the site of the fistula, a feeling of impending doom, itching, urticaria, coryza, watery eyes, stomach cramps, and diarrhoea are among the side effects of dialysis. Symptoms could arise at any time during the first 30 minutes following dialysis due to hypersensitivity to the ethylene oxide used to sterilise dialyzers. The disorder is treated with intravenous antihistamines, steroids, and epinephrine. To assist avoid residual allergies, dialyzers should be completely cleaned before use. 20 to 40 minutes after starting dialysis, nonspecific type B dialyzer reactions brought on by complement activation cause chest or back pain. Changing the membrane of the dialyzer could prevent it.

Hemolysis: A port-wine look in the venous blood line and a significant drop in blood pressure are signs of acute hemolysis during dialysis. A port-wine appearance in the venous blood line, a considerable decline in the hematocrit, and a blood sample centrifuged with pink plasma are all signs of acute hemolysis during dialysis.

A fatal side effect brought on by foam in the dialyzer's venous blood line is an air embolism. A churning sound on chest auscultation may be audible. Aspirate air from the heart chambers using a percutaneously inserted needle or cardiac catheterization while the patient is in a left lateral recumbent position and receiving 100% oxygen through a mask.

Other general issues include headache (70%), chest and back pain (1%–4%), itching, and nausea and vomiting (10%). These are almost certainly related to hypotension or could be a first sign of disequilibrium syndrome. The concomitant hypotension is treated in order to alleviate the symptoms. It is sufficient to take one dose of metoclopramide (5–10 mg) prior to dialysis. During dialysis, acetaminophen can help with headaches. Itching brought on by low-grade hypersensitivity to the dialyzer membrane could be reduced by changing the membrane.[38]

Patients related factors

- Decreased cardiac reserve
- Autonomic dysfunction
- Impaired plasma volume refilling
- Impaired venous compliance
- Arrhythmias
- Anemia
- Drug therapy

Effect of Hemodialysis on Coagulation profile

The extracorporeal circuit uses either unfractionated or low molecular weight heparin (LMWH) to stop blood coagulation. Heparin is administered continuously, in

small doses, or as a single bolus of LMWH. For individuals with a high risk of bleeding or who need to avoid heparin, there are alternatives available, including saline flushes, regional citrate anticoagulation, prostacyclin, danaparoid, argatroban (a direct thrombin inhibitor), and lepirudin (recombinant hirudin).

A typical normal prescription for continuous infusion heparin is for giving a 2000 IU initial bolus, followed by an 800–1200 IU/h infusion that is terminated 30–60 minutes before the session ends. The repeated-bolus approach involves giving a first heparin bolus (for example, 4000 IU), then a second bolus (for example, 1000 to 2000 IU) after two hours. The preferred anticoagulant in many facilities is now LMWH, which is often administered as a bolus at the start of the session.

Hemodialysis worsens the thrombocytopenia by lowering the fraction of RNA-rich platelets by removing the younger and more active platelets.[46] Platelet aggregation is abnormal, probably due to reduced intraplatelet ADP and serotonin levels, and defective thromboxane A2 production. Platelet function may also be hindered in uremic patients by increased local nitric oxide production. An adhesion receptor, the glycoprotein (GP) IIb–IIIa complex, plays an important role in controlling the formation of platelet thrombi. In uremic patients, the activation of the GP IIb–IIIa receptor is impaired, but activation is partially restored by dialysis. Reused dialyzers and synthetic membranes appear to have less of an impact on platelet activation than cellulosic membranes when it reaches dialyzer membranes.[47]

During hemodialysis, the platelet count drops, although this drop is often minor, tends to peak around 15 to 30 minutes into hemodialysis, and largely disappears by the end of hemodialysis. Heparin, often known as unfractionated heparin, is the most widely used anticoagulant for HD. Heparin's ability to induce

immune-mediated thrombocytopenia as a result of the development of IgG antibodies against the combination of platelet factor 4 (PF4) and heparin is well documented (HIT antibodies). Thrombocytopenia, platelet activation, and enhanced PF4 release from platelets during a heparin dialysis session are additional effects of heparin that may be related to HD.[48,49]

Anticoagulant (heparin) use in HD, which binds to the enzyme inhibitor antithrombin III, is what causes the rise in aPTT level. This inactivates thrombin and other blood-clotting proteases.[47] Another possible factor that could account for the increased heaemostasis parameters would be the increase in the level of TFPl (potent inhibitor of the extrinsic coagulation pathway) and the reduced activity of several coagulation factors during HD, including factor II, IX, X, and XII (Maderna et al., 1999; Naumnik et al., 2002). These finding were consistent with the work of Mohamed et al. (2008) who found a statistically significant increase of PT and a highly significant increase of APTT after-HD.

Dialysis alters various haematological and biochemical parameters, as well as the coagulation profile, so it is critical for a clinician/nephrologist to keep these factors in mind when dealing with such patients, in order to understand the efficacy and unfavourable effects of hemodialysis and plan the necessary treatment.[43]

MATERIAL & METHOD

Source of data: Patients admitted in the wards and Hemodialysis unit with diagnosis of chronic kidney disease undergoing hemodialysis at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi.

Study Design: A Cross Sectional study.

Study Period: January 2021 to December 2021.

Sample Size: 50

The formula used for sample size calculation is,

$$n = \sigma d2\ (Z\alpha 2 /+ Z\beta)2/\ (\mu 1 - \mu 2)2$$

$$\sigma d2 = 2 \times (1 - \rho)\ \sigma 2$$

$$d = |\mu 1 - \mu 2|\ /\sigma d2$$

Where μ1 is the mean of the pre-test, μ2 is the mean of the post-test, for 95% confidence level, $Z\alpha/2$ values are 1.96 and for 90% power $Z\beta$ value is 1.28. Here we assume effect size (d) as medium, i.e., d = 0.5, with this assumed d, 95% confidence level and 90% power, minimum sample size required is 44 subjects.

Assuming 10% lost to follow-up cases, final minimum sample size required is 48 subjects. For our convenience we have taken 50 as sample size.

Sample Method: All consecutive patients who are fulfilling the inclusion, exclusion criteria and providing informed written consent were enrolled in the study.

Inclusion Criteria

- Age more than 18 years
- Chronic Kidney Disease on Hemodialysis

Exclusion Criteria

- Patients suffering from any disease that could affect their Coagulation profile.
- Malignancy, inherited or acquired blood diseases, bleeding diathesis or recent haemorrhagic episode
- Pregnant and lactating women.
- Recent blood or platelet transfusion
- Patients with chronic liver disease (CLD), hemorrhagic disorder and patients on oral anticoagulants.

Methodology

- All patient fulfilling inclusion criteria who are admitted in wards or visiting Hemodialysis unit and willing to participate in the study are enrolled in this study after taking an informed consent.
- Diagnosis of chronic kidney disease is based on 2012 KDIGO guideline which states abnormalities of kidney structure or function, present for >3 months and one of 2 criteria documented for >3 months either GFR <60 ml/min /1.73 m^2 or markers of kidney damage i.e., albuminuria presence of urinary sediments for >3 months, fluids and electrolyte imbalance due to tubular dysfunction, radiologically abnormal kidney, abnormal kidney on biopsy, any patient of post renal transplant

- eGFR calculated using Cockcroft–Gault formula
    - Men:(140−age in years) (weight in Kg) 72 × $serumCreatinine$
    - Women: (140 − age in years) (weight in Kg) × 0.872 × $serum\ Creatinine$
- Venous Samples were collected from the patients before and after the haemodialysis. 5 ml of venous blood was collected in 2 different test tubes containing sodium citrate for coagulation profile (PT, aPTT) and EDTA for platelet count and results were Compared.

Does the study require any investigations or interventions to be conducted on patients or other humans or animals? If so, please describe briefly;

Yes, Investigations that are required for the patients are

1. Platelet count (lac/mm3)
2. Plasma Prothrombin Time (PPT)
3. Activated Partial Thromboplastin Time (aPTT)

STATISTICAL ANALYSIS:

Data is analysed using statistical software R version 4.2.1. and Microsoft Excel. Categorical variables are represented by frequency and percentage. Continuous variables given in Mean ± SD / Median (Min, Max) form. Normality of variable is checked by Shapiro Wilk test and QQ plot. Wilcoxon test is used to compare the distribution of different variables over timepoints. McNemar test is used to compare the variables over timepoints. P-value less than or equal to 0.05 indicates statistical significance.

RESULTS

The data contains measurement on 50 subjects whose age ranges from 28 to 78 years with mean age of 53.48 ± 13 years.

Table 5.1: Distribution of subjects according to age.

Age (years)	Number of subjects (%)
21-40	10 (20%)
41-60	27 (54%)
61-80	13 (26%)
Mean ± SD Median (Min, Max)	53.48 ± 13 54 (28, 78)

Majority (54%) subjects in the age group of 41-60 years. 13 (26%) between 61-80 years and 10 (20%) in 21-40 years.

Figure 5.1: Distribution of subjects according to age.

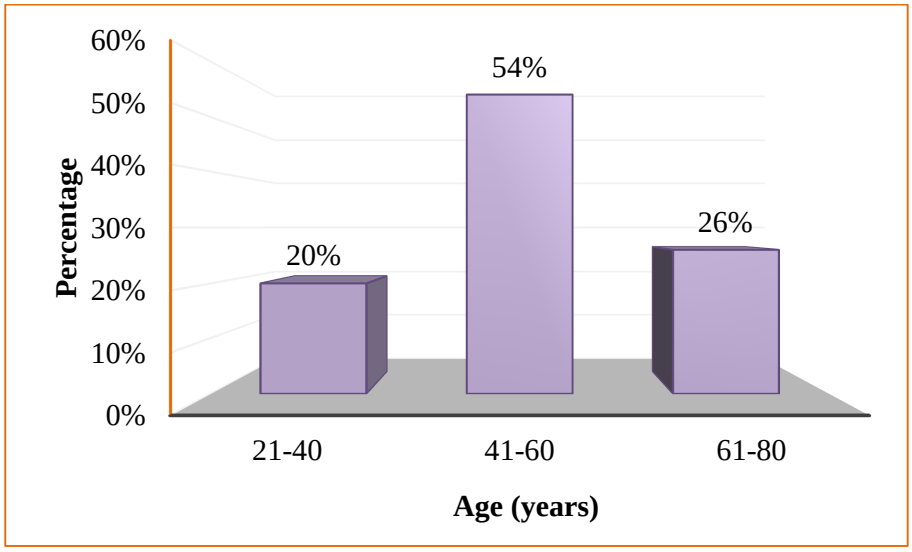


Table 5.2: Distribution of subjects according to gender.

Gender	Number of subjects (%)
Female	21 (42%)
Male	29 (58%)

Out of 50 subjects, 29 (58%) were males and 21 (42%) were females with gender ratio of 1.38:1.

Figure 5.2: Distribution of subjects according to gender.

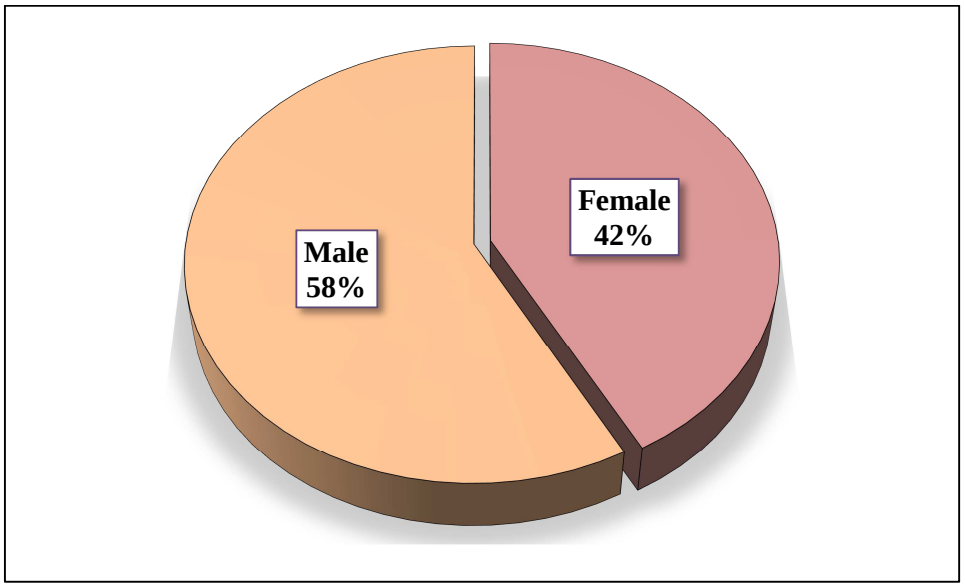


Table 5.3: Summary of different variables.

Variables	Mean ± SD	Median (Min, Max)
Creatinine	8.35 ± 4.61	7.51 (2.03, 24.82)
Weight (Kg)	74.86 ± 17.36	72.5 (47, 112)
eGFR (ml/min)	13.27 ± 8.09	10.67 (4.48, 38.32)
CKD duration (years)	4.3 ± 2.47	4 (0.58, 9)
Hemoglobin	9.99 ± 1.96	9.7 (5, 14.3)

The weight of subjects ranged from 47 Kg to 112 Kg with mean of 74.86 ± 17.36 Kg. The creatinine level ranged from 2.03 to 24.82 with mean of 8.35 ± 4.61. The eGFR ranged from 4.48 ml/min to 38.32 ml/min with mean of 13.27 ± 8.09 ml/min. The CKD duration ranged from 7 months to 9 years with mean duration of 4.3 ± 2.47 years. The hemoglobin level ranged from 5 to 14.3 with mean hemoglobin of 9.99 ± 1.96.

Table 5.4: Distribution of subjects according to etiology.

Etiology	Number of subjects (%)
Chronic Glomerulus nephritis	2 (4%)
Chronic tubulointerstitial nephritis	17 (34%)
Diabetic Nephropathy	15 (30%)
Hypertensive nephrosclerosis	10 (20%)
IGA Nephropathy	1 (2%)
Lupus nephritis	2 (4%)
Autosomal dominant polycystic kidney disease	2 (4%)
Renal calculi	1 (2%)

Out of 50 subjects, diabetic nephropathy was observed in 15 (30%), Chronic Tubulo-interstitial nephritis in 17 (34%) subjects and Hypertensive nephrosclerosis was seen in 10 (20%).

Figure 5.3: Distribution of subjects according to etiology

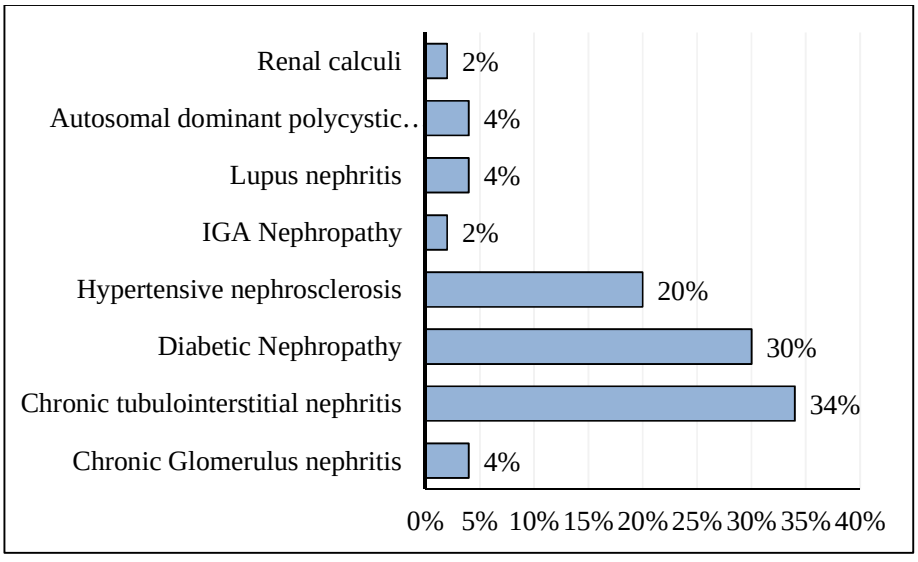


Table 5.5: Distribution of subjects according to comorbidity.

Comorbidities	Number of subjects (%)
Diabetes	17 (34%)
Hypertension	37 (74%)
Hypothyroidism	4 (8%)
Heart failure	2 (4%)
Anemia	10 (20%)
Ischemic heart disease	5 (10%)
Lupus	3 (6%)
Left vocal cord palsy	1 (2%)
Pneumonia	1 (2%)
Multiple myeloma	3 (6%)
Psoriasis	1 (2%)
None	6 (12%)

Out of 50 subjects, Hypertension in 37 (74%), Diabetes in 17 (34%), Anemia was observed in 10 (20%), ischemic heart disease in 5 (10%) and Hypothyroidism was observed in 4 (8%). 6 (12%) subjects didn't have any comorbid diseases.

Note: The total is more than 50 (100%) as few subjects had more than one comorbidity.

Figure 5.4: Distribution of subjects according to comorbidity.

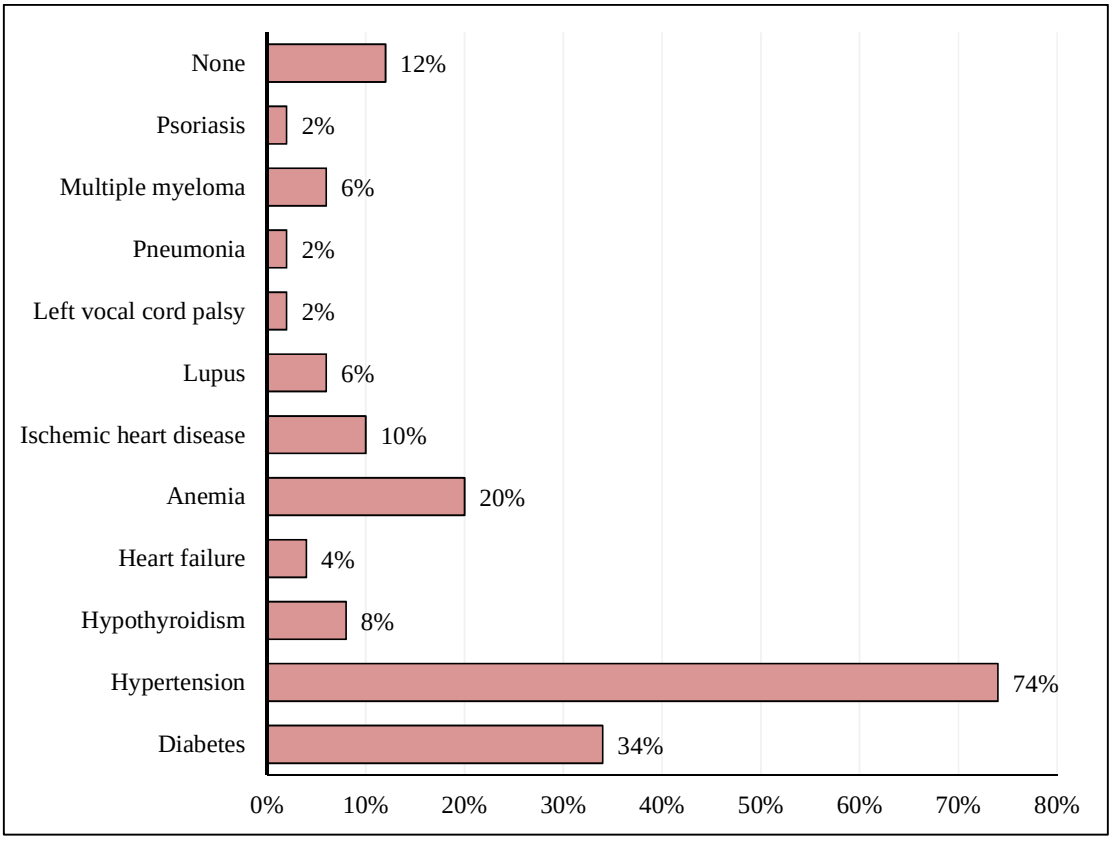


Table 5.6-Comparison of coagulation profile over timepoints.

Variables	Time points		p-value
	Pre-dialysis (Mean ± SD) Median (Min, Max)	**Post-dialysis (Mean ± SD) Median (Min, Max)**	
Platelet count	204.56 ± 78.43 186 (36,404)	174.14 ± 70.1 158 (20, 392)	**0.0326^{W}***
PT test	15.41 ± 8.86 12.3 (9.9, 61.8)	19.35 ± 12.02 17.05 (9.1, 81)	**0.0024^{W}***
Ratio (PT test/ PT control)	1.27 ± 0.65 1.04 (0.85, 4.61)	1.6 ± 0.9 1.44 (0.78, 6.04)	**< 0.001^{W}***
INR	1.29 ± 0.75 1.04 (0.85, 5.3)	1.63 ± 1.04 1.46 (0.78, 7.23)	**< 0.001^{W}***
APTT test	37.86 ± 9.36 36.5 (22.4, 74)	49.86 ± 22.34 42.7 (30.1, 174)	**< 0.001^{W}***
Ratio (APTT test/ APTT control)	1.14 ± 0.29 1.09 (0.62, 2.28)	1.5 ± 0.62 1.31 (0.83, 4.78)	**< 0.001^{W}***

*Abbreviation: W – Wilcoxon test, * indicates statistical significance.*

- From Wilcoxon test, it is observed that, mean pre-dialysis PT (15.41 ± 8.86), aPTT (37.86 ± 9.36) and Platelets (204.56 ± 78.43). A statistically significant increase in mean PT (19.35 ± 12.02), aPTT (49.86 ± 22.34) and reduction in platelets count (174.14 ± 70) post dialysis with a p-value of <0.05.

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Figure 5.5: Mean plot of platelet over timepoints.

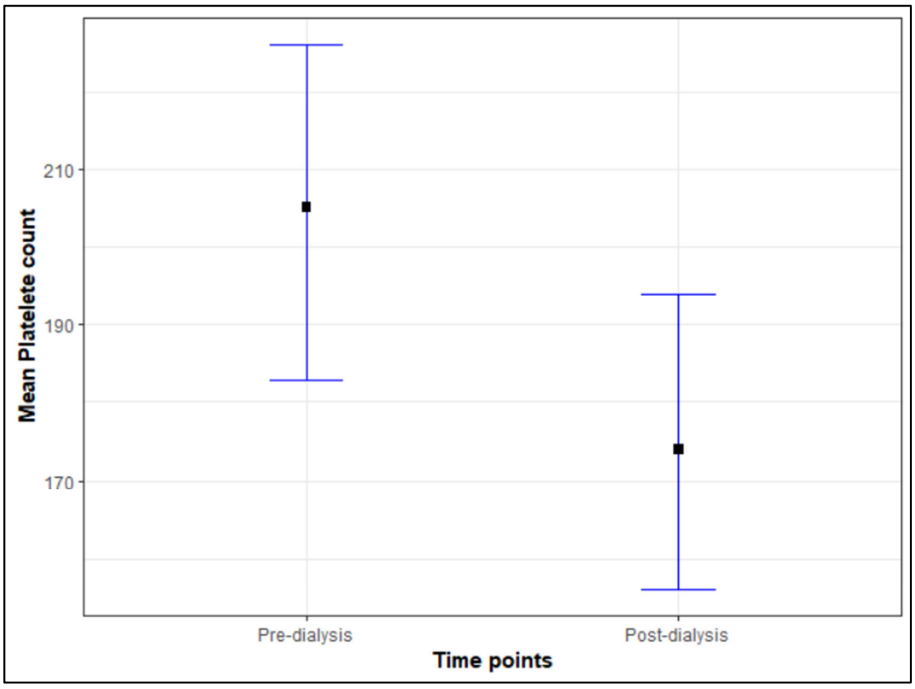


Figure 5.6: Mean plot of PT test over timepoints.

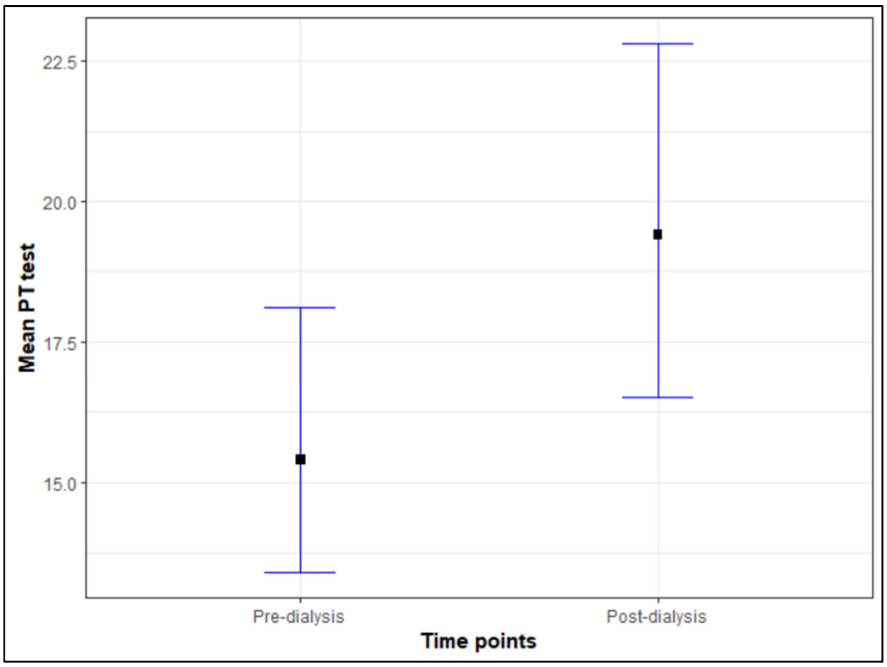


Figure 5.7: Mean plot of Ratio over timepoints.

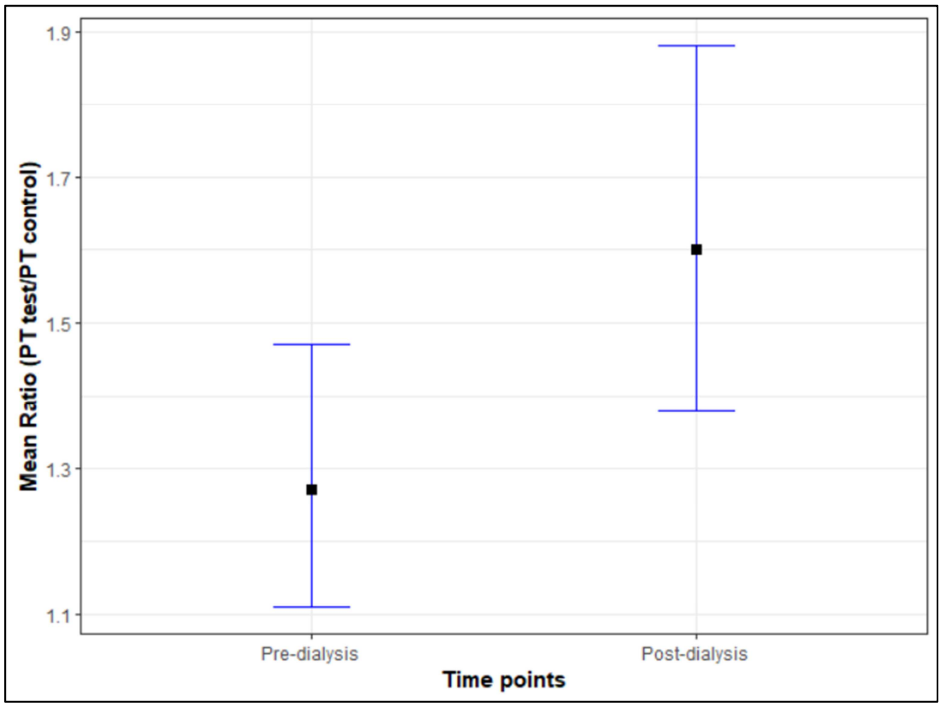


Figure 5.8: Mean plot of INR over timepoints.

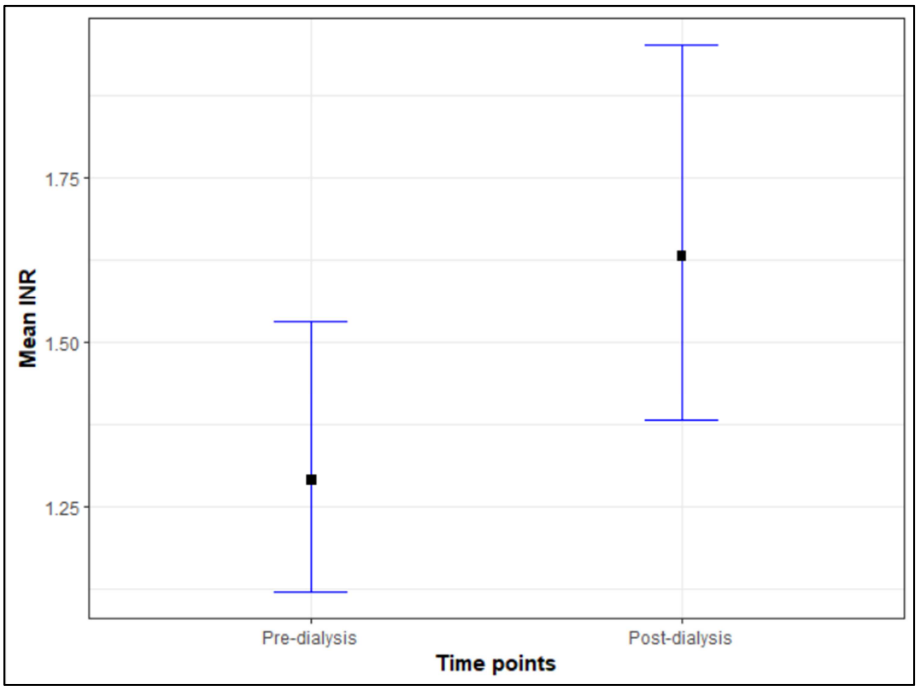


Figure 5.9: Mean plot of APTT test over timepoints.

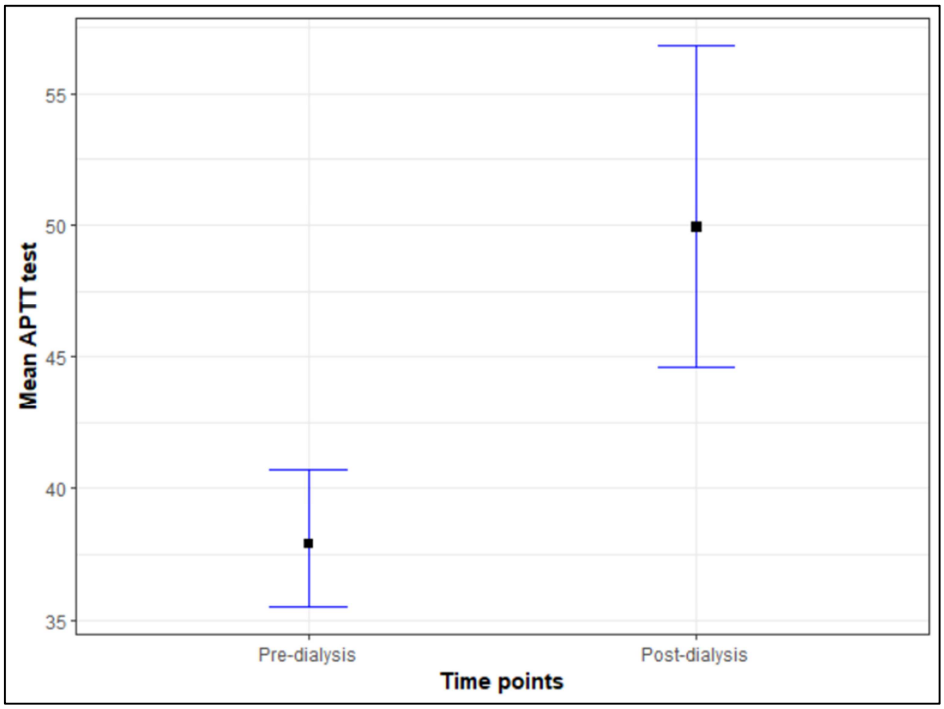


Figure 5.10- Mean plot of Ratio over timepoints.

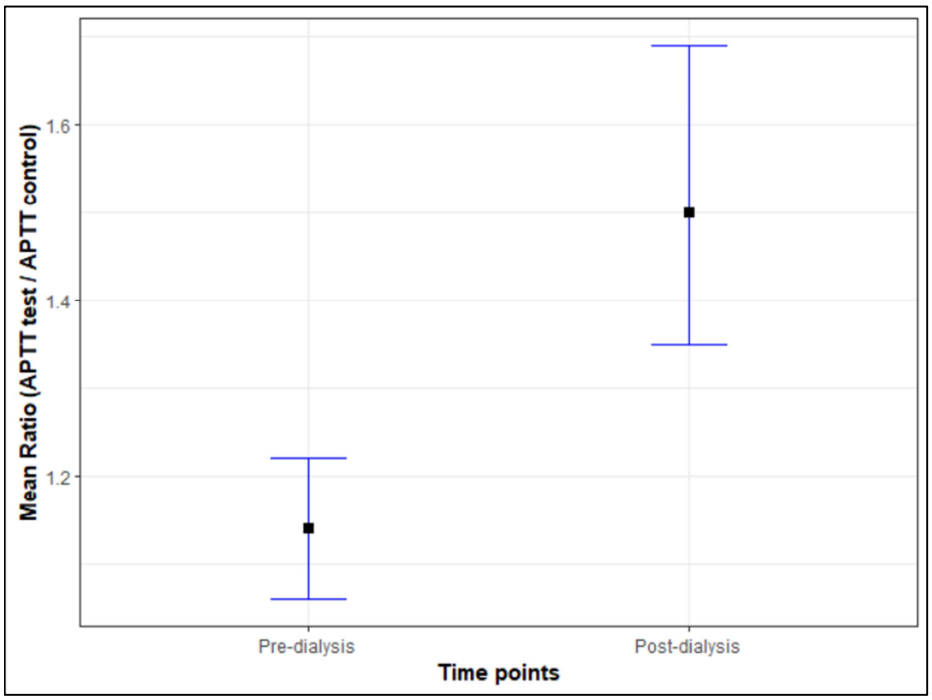


Table5.7-Comparison of different variables over timepoints.

Variables	Sub Category	Time point		p-value
		Pre-dialysis	Post-dialysis	
Breathlessness	-	10 (20%)	21 (42%)	**0.0016^{W}***
	+	6 (12%)	5 (10%)	
	++	8 (16%)	11 (22%)	
	+++	16 (32%)	13 (26%)	
	++++	10 (20%)	0 (0%)	
Pedal edema	Absent	14 (28%)	16 (32%)	0.1126^{W}
	Grade 1	4 (8%)	6 (12%)	
	Grade 2	11 (22%)	16 (32%)	
	Grade 3	16 (32%)	12 (24%)	
	Grade 4	5 (10%)	0	
Abdominal distension	Absent	45 (90%)	50 (100%)	**0.0254^{MN}***
	Present	5 (10%)	0	
Abdominal pain	Absent	32 (64%)	45 (90%)	**0.0003^{MN}***
	Present	18 (36%)	5 (10%)	
Vomiting Nausea	Absent	14 (28%)	36 (72%)	**< 0.001^{MN}***
	Present	36 (72%)	14 (28%)	
Fatigue	Absent	34 (68%)	36 (72%)	0.1573^{MN}
	Present	16 (32%)	14 (28%)	
Loss of appetite	Absent	22 (44%)	32 (64%)	**0.0016^{MN}***
	Present	28 (56%)	18 (36%)	
Oliguria	Absent	36 (72%)	36 (72%)	1^{MN}
	Present	14 (28%)	14 (28%)	
Pallor	Absent	22 (44%)	24 (48%)	0.1573^{MN}
	Present	28 (56%)	26 (52%)	

*Abbreviation: MN – McNemar test, W – Wilcoxon test, * indicates statistical significance.*

From McNemar test and Wilcoxon test, it is observed that, there is significant improvement in the degree of breathlessness, abdominal distension, abdominal pain, vomiting nausea and loss of appetite over time. There is no significant improvement in the degree of pedal edema, fatigue, oliguria and pallor over time.

Figure 5.11-Distribution of breathlessness over timepoints.

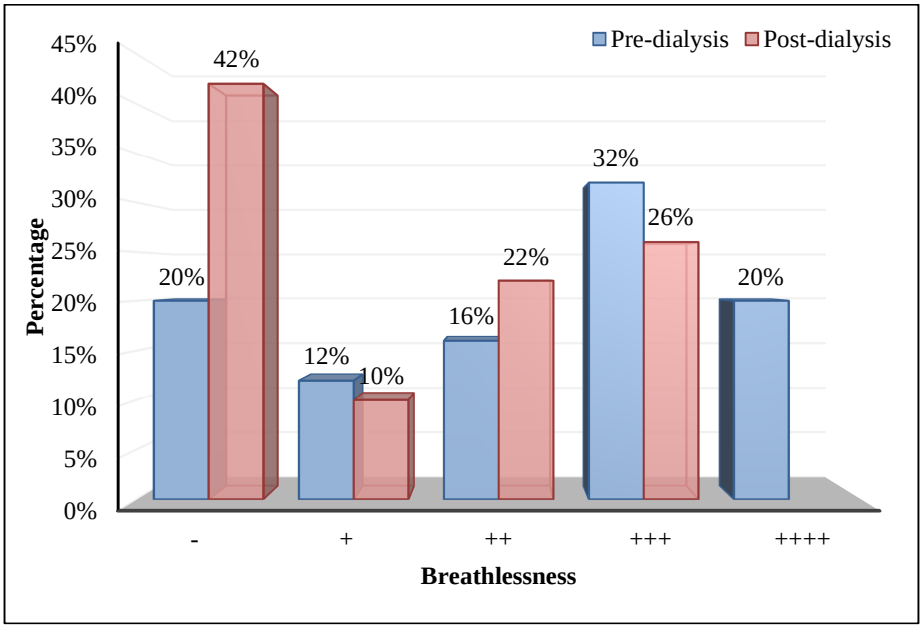


Figure 5.12- Distribution of pedal edema over timepoints.

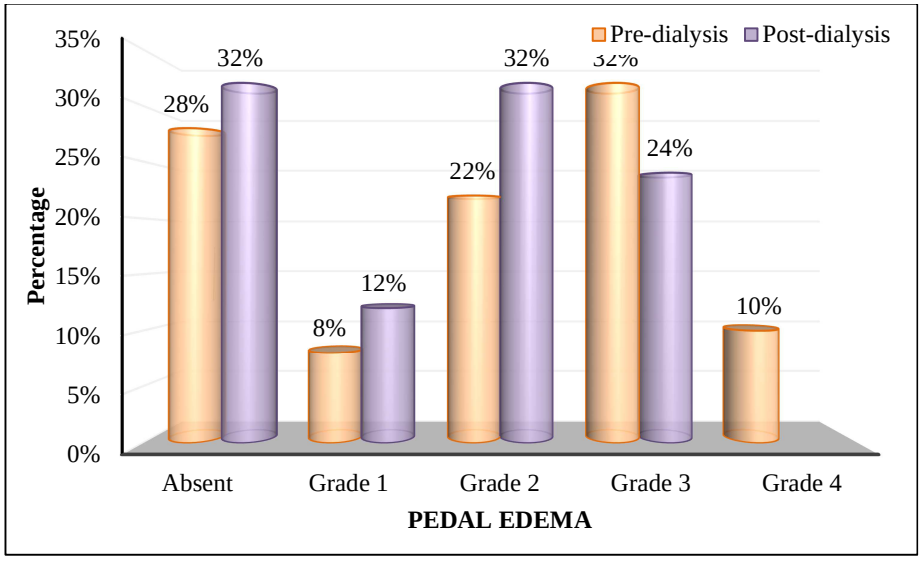


Figure 5.13- Distribution of fatigue over timepoints.

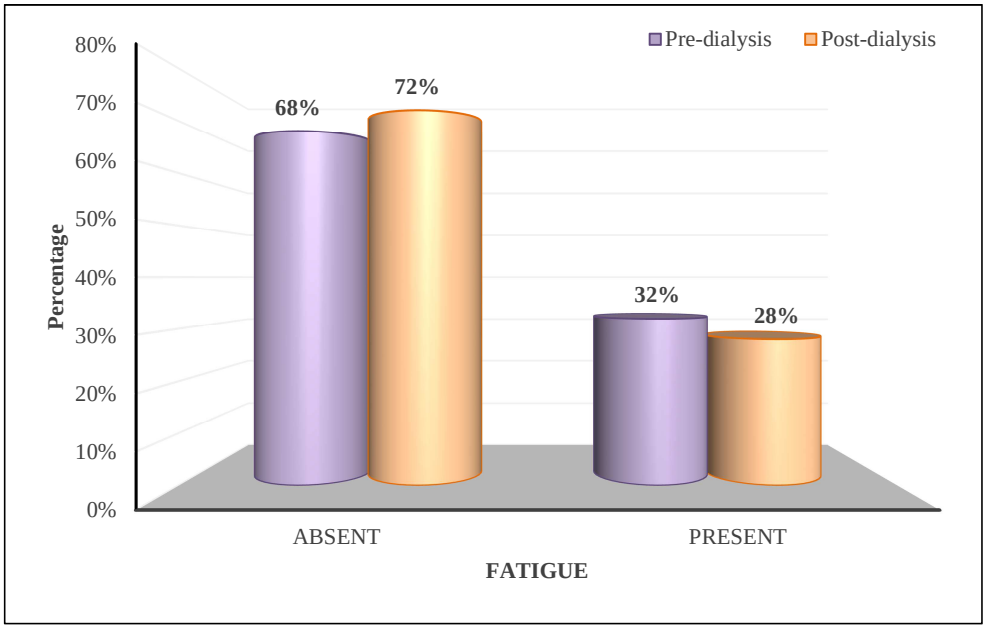


Figure 5.14- Distribution of loss of appetite over timepoints.

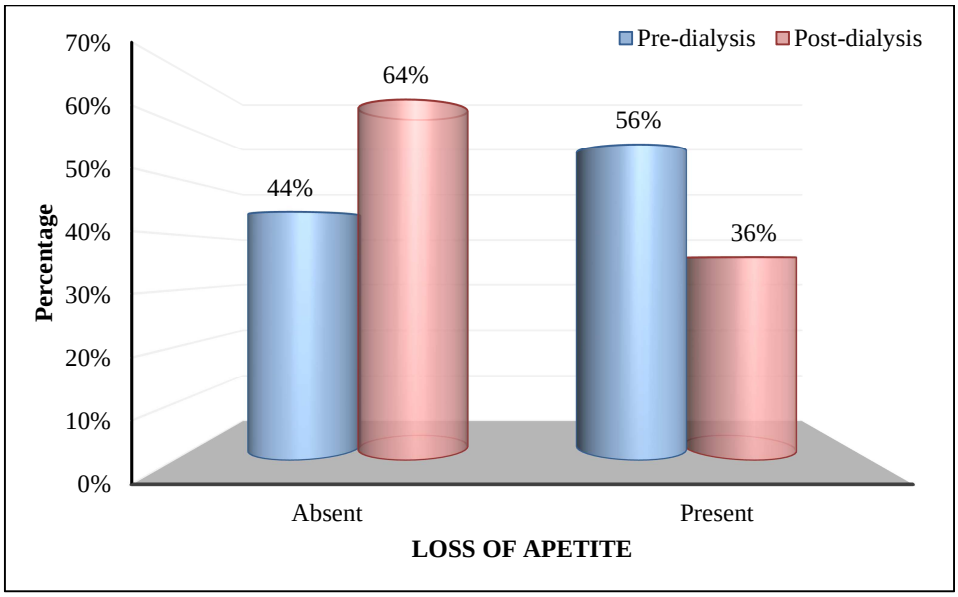
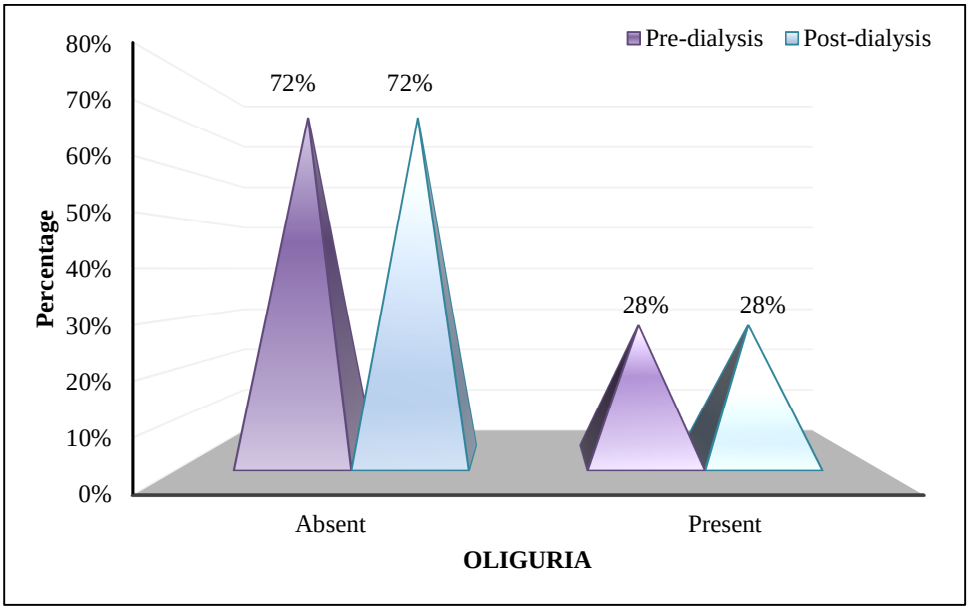


Figure 5.15- Distribution of Oliguria over timepoints.



DISCUSSION

Chronic kidney disease (CKD) is a global public health problem. An increased bleeding risk has been described for patients with end-stage renal disease reaching from minor events such as bruises and bleeding at venepuncture sites to menorrhagia and gastrointestinal blood loss. Bleeding can significantly contribute to mortality and morbidity. Blood vessel morphological changes, anaemia, thrombocytopenia, uraemic disturbance of platelet adhesion and aggregation, coagulation, fibrinolysis, and an increased risk of venous thromboembolism in patients with end-stage renal disease are all contributing factors to bleeding diathesis. The aforementioned factors also have an impact on platelet count, PT, and aPTT values. [4,5]

Acute kidney injury (AKI), which causes a sudden loss of kidney function, or chronic kidney disease, which causes a slow, steady loss of function, both require dialysis to maintain homeostasis. It serves as a stopgap solution for acute renal damage till recovery of renal function, and in CKD to buy time until a kidney transplant can be performed, or to maintain individuals who are ineligible for transplant[25].

Present study aimed to measure and compare the changes in the coagulation profile among the patients in pre and post hemodialysis in CKD.

In present study total of 50 patients fulfilling inclusion criteria are included after obtaining the informed consent. The mean age of patients was 53.48±13.02. Among the 50 patients, 58% (29) were male and 42% (21) were female with male preponderance in the study. Similar to present study. Zoya K et al., observed that

among the study population, 59 (59%) of the patients were males and 41 (41%) of the patients were females.[43]

In our study we studied different variables and found the weight of subjects ranged from 47 Kg to 112 Kg with mean of 74.86 ± 17.36 Kg. The creatinine level ranged from 2.03 to 24.82 with mean of 8.35 ± 4.61. The eGFR ranged from 4.48 ml/min to 38.32 ml/min with mean of 13.27 ± 8.09 ml/min. The CKD duration ranged from 7 months to 9 years with mean duration of 4.3 ± 2.47 years. The hemoglobin level ranged from 5 to 14.3 with mean hemoglobin of 9.99 ± 1.96.

Out of 50 subjects, diabetic nephropathy was observed in 15 (30%), Chronic Tubulo-interstitial nephritis in 17 (34%) subjects, hypertensive nephrosclerosis was seen in 10 (20%), Chronic Glomerulus nephritis in 2 (4%), IGA Nephropathy in 1 (2%), Lupus nephritis in 2 (4%), Autosomal dominant polycystic kidney disease in 2 (4%) and Renal calculi in 1 (2%).

In our study we observed associated comorbidities like Hypertension in 37 (74%), Diabetes in 17 (34%), Anemia was observed in 10 (20%), ischemic heart disease in 5 (10%) and Hypothyroidism was observed in 4 (8%). Heart failure 2 (4%), Lupus in 3 (6%), Left vocal cord palsy in 1 (2%), Pneumonia in 1 (2%), Multiple myeloma in 3 (6%), Psoriasis in 1 (2%) and 6 (12%) subjects didn't have any comorbid diseases.

In our study, there is statistically significant lower mean level of Platelet and prolongation of mean PT, APTT and INR in post-dialysis compared to the pre-dialysis patients. ($p<0.05$), In concordance to present study, Raja V et al., documented the significant reduction in the platelet count and significant prolongation of both PT

and aPTT values in post-dialysis compared to pre-dialysis levels.[47] Similarly, Hemaningsih Y et al., noticed significant increase in aPTT levels in post Dialysis patients. PTT evaluation in pre- and post-HD showed no significant difference. Alghythan et al.,[50] and Khan et al.,[51] showed similar results where, PT and aPTT increased after dialysis.

Khalid A et al., similar to present study documented a significant increase in the haemostatic parameters post dialysis with mean PT and APTT 15.64±3.18 and 46.54±24.68 seconds respectively with a p-value of <0.001 for both parameters. Prothrombin time and activated partial thromboplastin time are both prolonged following haemodialysis in individuals with end-stage renal failure.[40] The use of heparin during hemodialysis as an anticoagulant prolongs PPT and APTT by suppressing antithrombin III in post-HD patients and HD procedures reduce the activity of coagulation factors II, IX, X, and XII, resulting in further prolongation of APTT post-HD[44]

We observed, there is significant improvement in the degree of breathlessness, abdominal distension, abdominal pain, vomiting nausea and loss of appetite post dialysis. There is no significant improvement in the degree of pedal edema, fatigue, oliguria and pallor post HD.

CONCLUSION

Our study we found a significant changes in the coagulation profile among the patients undergoing hemodialysis. We demonstrated significant prolongation in the PT, INR and aPTT and significant drop in platelet count post-dialysis period compared to pre-dialysis. Our study demonstrated the importance of monitoring the coagulation profile among the CKD patients on hemodialysis, which will aid to understand and detect the CKD patients with higher risk for bleeding.

LIMITATIONS

- Small sample size of the study
- Study design is Cross Sectional so the state of morbidity and mortality of the patient could not be assessed as most of the patients were discharged after the dialysis procedure.

SUMMARY

Present cross-sectional study was conducted among the patients admitted in the wards and Hemodialysis unit with diagnosis of chronic kidney disease at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi.

- Total of 50 patients fulfilling inclusion criteria are included after obtaining the informed consent.
- The mean age of patients was documented as 53.48 ± 13 years. Majority (54%) subjects belonged to the age group of 41-60 years. 13 (26%) in age group of 61-80 years and 10 (20%) in age group of 21-40 years.
- Males were 29 (58%) and 21 (42%) were females with gender ratio of 1.38:1.
- The weight of subjects ranged from 47 Kg to 112 Kg with mean of 74.86 ± 17.36 Kg.
- The creatinine level ranged from 2.03 to 24.82 with mean of 8.35 ± 4.61.
- The eGFR ranged from 4.48 ml/min to 38.32 ml/min with mean of 13.27 ± 8.09 ml/min.
- The CKD duration ranged from 7 months to 9 years with mean duration of 4.3 ± 2.47 years.
- The hemoglobin level ranged from 5 to 14.3 with mean hemoglobin of 9.99 ± 1.96.
- Diabetic nephropathy in 15 (30%), Chronic Tubulo-interstitial nephritis in 17 (34%) and Hypertensive nephrosclerosis was seen in 10 (20%)
- Hypertension in 37 (74%), Diabetes in 17 (34%), Anemia was observed in 10 (20%), ischemic heart disease in 5 (10%) and Hypothyroidism in 4 (8%). 6 (12%) subjects didn’t have any comorbid diseases

- Mean pre-dialysis Platelets, PT and APTT were 204.56 ± 78.43, 15.41 ± 8.86 and 37.86 ± 9.36 seconds respectively. A statistically significant increase in mean PT and APTT 19.35 ± 12.02 and 49.86 ± 22.34 seconds respectively and reduction in platelets count 174.14 ± 70 post dialysis with a p-value of <0.05

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ANNEXURE – I

INFORMED CONSENT

Dear Mr./Mrs./Dr. _____, you are kindly requested to enrol yourself in a research study tilted, "**Pre-And Post-Hemodialysis Coagulation Profile of Patients with Chronic Kidney Diseases attending Hemodialysis Unit– A One Year Cross Sectional Study At Tertiary Care Centre"** being conducted by **Dr. Nixon Goyal**, a Post Graduate Student in MD. General Medicine and the study will be carried out under the direct supervision and guidance of **Dr. _____** Professor, Department of General Medicine, Jawaharlal Nehru Medical College, Belagavi.

You have been requested to participate in this as you fit into the laid-out criteria for a study 'subject'/ participant.

Your participation in study is voluntary. During the study you will be asked some questions and you are supposed to answer to the best of your knowledge. Your decision whether or not to participate in the study will not affect your treatment in any form. If you decide not to participate you are free to withdraw at any time.

TITLE OF THE STUDY: "Pre-And Post-Hemodialysis Coagulation Profile of Patients with Chronic Kidney Diseases attending Hemodialysis Unit– A One Year Cross Sectional Study At Tertiary Care Centre**"**

PURPOSE OF THE STUDY: To Study the changes in Coagulation Profile, Pre-And Post-Hemodialysis in Chronic Kidney Diseases Patients.

PROCEDURES INVOLVED:

1. Plasma Prothrombin Time (PPT)
2. Activated Partial Thromboplastin Time (APTT)
3. Platelet count (lac/mm3)

If you agree to enroll yourself in my study, you will be interviewed regarding your present, past and family history then you will be clinically examined in detail and investigated accordingly. Then you will be subjected to a few investigations namely

1. Plasma Prothrombin Time (PPT)
2. Activated Partial Thromboplastin Time (APTT)
3. Platelet count (lac/mm3)

RISKS AND BENEFITS: There are no potential risks involved in this study.

Benefits of taking part in this research: By taking part in this study, Coagulation Profile, pre and post Hemodialysis can be known.

VOLUNTARY PARTICIPATION / WITHDRAWAL FROM THE STUDY: Taking part in the study is voluntary. You may choose not to enroll yourself in this study and may choose to leave the study anytime in between.

ALTERNATIVES: Your decision regarding participation in study will not change present or future health care services offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi. You

would simply be excluded from the study if you wish to, and all your details shall be kept confidential and you will get the routine line of management.

PRIVACY AND CONFIDENTIALITY: All data collected or disclosed by you during the course of participation of study, will be kept fully confidential. If however during the course it becomes necessary for the progress of the course to disclose the identity, it would be done so only after your informed & written consent. The only people to know that you are a research subject are members of the research team. No information about you will be disclosed to other without your written permission except:

- In emergency to protect your rights and welfare.
- If required by law.

AUTHORIZATION TO PUBLISH RESULT: The results of the study may be used to publish an article. When the results of research published or discussed, in a conference, no information will be displayed that would disclose your identity. Any information obtained in connection with this study and that can be identified with you will remain confidential.

FINANCIAL INCENTIVES FOR PARTICIPATION: No additional costs shall be incurred upon you for the purpose of this study. It is purely being done with the idea of research and all the cost of study will be borne by the investigator.

COMPENSATION: In the event that you become injured as a result of taking part in this study, treatment will be offered to you at KLES Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi, or you will be given information about where to receive medical care. However, no reimbursement, compensation or free medical care will be given.

QUESTIONS/CONTACT DETAILS: You shall be free to contact the below mentioned name & addresses anytime during the study period for any clarification or help as you may desire for.

In case of the queries during study or in future you may contact following persons,

1. DR. HARSHA HEGDE,
CHAIRPERSON,
JNMC IEC AND SCIENTIST D, ICMR,
NATIONAL INSTITUTE OF TRADITIONAL MEDICINE,
MOB NO: 9480422500

CONSENT FORM

I voluntarily agree to take part in this study by signing below. I may withdraw at any time. I am not giving up any of my legal rights by signing this form. My signature below indicates that I have read this consent form, or it has Been read to me, this consent form and have had all the questions answered

Signature / Left Thumb print of the Participant or legally authorized representative

Participant's name: ……...

Signature / Left thumb impression of the participant ……...

Name of the legally authorized: ……...

representative / guardian:

Signature / Left thumb impression: ……...

Witness' name: ……...

Signature / Left thumb impression: ……...

Investigator's name and signature: ……...

Date:

Place:

ANNEXURE – II

PROFORMA

Case no:

Name:

OP/IP No:

Age/ Sex:

Address:

Occupation:

Complaints at presentation:

Past history:	
Family history:	
Personal history:	
Treatment history:	
Etiology:	

PHYSICAL EXAMINATION:

GENERAL CONDITION:	
Blood Pressure:	Temperature
Pulse Rate:	Respiratory Rate
Pallor- Yes/No	Edema-Yes/No
Icterus-Yes/No	Weight
Clubbing-Yes/No	Urine Output:

SYSTEMIC EXAMINATION:

C.V.S:

C.N.S:

R.S:

P.A:

INVESTIGATIONS:

1. Plasma Prothrombin Time (PPT)
2. Activated Partial Thromboplastin Time (APTT)
3. Platelet count (lac/mm3)

	PT	**INR**	**aPTT**	**Platelets**
Pre Dialysis				
Post Dialysis				

ANNEXURE - III - MASTER CHART

S.NO	IP/OP number	HEMODIALYSIS	AGE	SEX	CREATININE	WEIGHT (kg)	eGFR ml/min	CKD Duration	HEMOGLOBIN	PLATLETS	PT CONTROL	PT TEST	RATIO	INR	APTT CONTROL	APTT TEST	RATIO	ETIOLOGY	COMORBIDITIES	BREATHLESSNESS	PEDAL EDEMA	ABDOMINAL DISTENSION	ABDOMINAL PAIN	VOMITING NAUSEA	FATIGUE	LOSS OF APPETITE	OLIGURIA	PALLOR
1	1137505	PRE-DIALYSIS	50	F	11.66	60	5.467409949	5 years	11.5	136	13.4	19.7	1.47	1.53	36.4	39.2	1.076923077	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENTION	+++	GRADE 3	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								110	13.4	19.2	1.43	1.48	36.4	55.2	1.516483516			++	GRADE 2	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT
2	1083051	PRE-DIALYSIS	48	M	8.63	69	10.21629973	3 years	9.5	155	13.4	14.3	1.07	1.08	36.4	43.6	1.197802198	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	NONE	++++	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								117	13.4	43.3	3.23	3.63	36.4	50.1	1.376373626			+++	Grade3	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
3	1129617	PRE-DIALYSIS	68	M	9.12	75	8.223684211	5 years	11.2	144	13.4	13.2	0.99	0.99	36.4	44.2	1.214285714	CHRONIC GLOMERULOUS NEPHRITIS	HYPERTENTION, ANEMIA	-	GRADE 4	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								99	13.4	43.1	3.21	3.21	36.4	60.2	1.653846154			-	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
4	5880960	PRE-DIALYSIS	30	F	14.11	52	4.785809906	2 years	9.4	231	13.4	61.8	4.61	5.3	36.4	46.6	1.28021978	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENTION	++	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								151	13.4	30.8	2.29	2.3	36.4	174	4.78021978			++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
5	1578716	PRE-DIALYSIS	57	F	7.5	51	6.663055556	8 years	9.6	244	13.4	41.6	3.1	3.47	36.4	39.2	1.076923077	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENTION	+++	GRADE 3	ABSENT	PRESENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								190	13.4	15.3	1.14	1.14	36.4	31.2	0.857142857			++	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT
6	1113621	PRE-DIALYSIS	55	M	6.95	80	13.5891287	7 years	12.9	251	13.4	24.2	1.81	1.92	36.4	28.6	0.785714286	Diabetic Nephropathy	Diabetes	-	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								192	13.4	81	6.04	7.23	36.4	70.3	1.931318681			-	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT
7	5028649	PRE-DIALYSIS	71	M	3.4	84	23.67647059	4 years	10.7	213	13.4	19.2	1.43	1.48	36.4	28.3	0.777472527	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	NONE	++++	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								183	13.4	16	1.19	1.21	36.4	56.5	1.552197802			+++	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT
8	6390388	PRE-DIALYSIS	37	M	14.24	68	6.831304619	3 years	12.2	202	13.4	13.2	0.99	0.99	36.4	33.1	0.909340659	RENAL CALCULI	NONE	+++	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT
		POST-DIALYSIS								154	13.4	16.2	1.21	1.23	36.4	39.2	1.076923077			+++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT
9	3890811	PRE-DIALYSIS	62	M	15.96	89	6.041144528	2 years	10.4	131	13.4	14.1	1.05	1.06	36.4	22.4	0.615384615	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	MULTIPLE MYELOMA	+++	GRADE 4	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								102	13.4	14.1	1.05	1.06	36.4	30.1	0.826923077			+++	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
10	2464481	PRE-DIALYSIS	41	M	11.53	90	10.73287077	5 years	9.4	144	11.7	12.1	1.03	1.03	32.5	44.5	1.369230769	HYPERTENSIVE NEPHROSCLEROSIS	Hypertension	-	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT
		POST-DIALYSIS								139	11.7	11.6	0.99	0.99	32.5	50.2	1.544615385			-	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT
11	1134095	PRE-DIALYSIS	62	M	4.27	74	18.774395	6 years	10.9	214	11.7	11.4	0.97	0.97	32.5	32.9	1.012307692	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENSION	-	GRADE 3	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								155	11.7	11.8	1.01	1.01	32.5	40.5	1.246153846			-	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	PRESENT
12	1118849	PRE-DIALYSIS	74	F	3.85	61	12.3452381	3 years	7.3	272	11.7	11.6	0.99	0.99	32.5	35.9	1.104615385	Diabetic Nephropathy	DIABETES, HEART FAILURE,	++++	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								210	11.7	11.2	0.96	0.96	32.5	43.6	1.341538462			+++	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT
13	1119427	PRE-DIALYSIS	40	M	5.16	98	26.37812231	7 years	11.3	36	11.7	34.8	2.97	2.94	32.5	37.4	1.150769231	HYPERTENSIVE NEPHROSCLEROSIS	Diabetes, Hypertension	++++	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								20	11.7	20.9	1.79	1.78	32.5	40.5	1.246153846			++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
14	5321658	PRE-DIALYSIS	31	M	8.01	78	14.74198918	2 years	8.6	144	11.7	9.9	0.85	0.85	32.5	74	2.276923077	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	NONE	+++	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								156	11.7	9.1	0.78	0.78	32.5	102.4	3.150769231			++	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
15	6089129	PRE-DIALYSIS	50	M	10.1	102	12.62376238	5 yaers	9.5	142	11.7	10.2	0.87	0.87	32.5	27.1	0.833846154	AUTOSOMAL DOMINANT POYCYSTIC KIDNEY DISEASE	HYPERTENSION	++++	GRADE 2	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT

		POST-DIALYSIS								101	11.7	10.3	0.88	0.88	32.5	33.7	1.036923077			+++	GRADE 1	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT
16	**1095976**	**PRE-DIALYSIS**	37	M	24.82	88	5.072074492	1 year	8.6	268	11.7	11.4	1.02	1.02	32.5	29.2	0.898461538	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENSION	++++	GRADE 3	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								220	11.7	10.9	0.97	0.97	32.5	50.8	1.563076923			++	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT
17	**1127755**	**PRE-DIALYSIS**	50	F	4.2	66	16.69642857	3 years	9.2	159	11.7	15	1.28	1.28	32.5	45.6	1.403076923	AUTOSOMAL DOMINANT POYCYSTIC KIDNEY DISEASE	LEFT VOCAL CORD PALSY, HYPERTENSION,	++	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								166	11.7	16.6	1.42	1.42	32.5	51.7	1.590769231			++	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT
18	**1130991**	**PRE-DIALYSIS**	59	M	7.4	64	9.72972973	7 months	13.4	187	11.7	11.8	1.01	1.01	32.5	33.4	1.027692308	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENSION	+++	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								166	11.7	11.9	1.02	1.02	32.5	40.1	1.233846154			-	GARDE 2	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT
19	**1041516**	**PRE-DIALYSIS**	59	M	3.2	109	38.3203125	4 years	9	227	11.7	12	1.03	1.03	32.5	40.2	1.236923077	Diabetic Nephropathy	HYPERTENSION, HYPOTHYROIDISM,	+++	GRADE 3	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT
		POST-DIALYSIS								206	11.7	13.2	1.13	1.13	32.5	57.4	1.766153846			++	GRADE 3	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT
20	**1019854**	**PRE-DIALYSIS**	56	M	5.7	105	21.49122807	8 years	10.4	249	11.7	10.9	0.94	0.94	32.5	31.9	0.981538462	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENSION, ANEMIA, ISCHEMIC	+++	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT
		POST-DIALYSIS								230	11.7	19.7	1.68	1.68	32.5	43.7	1.344615385			+	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
21	**4711792**	**PRE-DIALYSIS**	59	M	8.2	96	13.17073171	4 years	10.3	276	11.7	18.5	1.58	1.59	32.5	28.1	0.864615385	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	NONE	++	GRADE 3	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT
		POST-DIALYSIS								221	11.7	23.7	2.02	2.02	32.5	65.5	2.015384615			-	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
22	**1110093**	**PRE-DIALYSIS**	54	F	2.03	69	34.50944171	3 years	9.6	394	13.4	19	1.42	1.47	36.4	43.2	1.186813187	Diabetic Nephropathy	Diabetes	++++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								240	11.7	17.6	1.5	1.5	32.5	34.5	1.061538462			+	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
23	**1041911**	**PRE-DIALYSIS**	65	M	4.61	77	17.39877079	6 years	12	149	11.2	16.3	1.46	1.45	32.5	36.5	1.123076923	Diabetic Nephropathy	HYPERTENSION, DIABETES ISCHEMIC	-	GRADE 1	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	ABSENT
		POST-DIALYSIS								145	11.7	33.3	2.84	2.84	32.5	40.6	1.249230769			-	GRADE 1	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	ABSENT
24	**1049915**	**PRE-DIALYSIS**	78	M	2.87	85	25.50329075	7 years	14.3	158	11.7	12.2	1.08	1.08	32.5	37.4	1.150769231	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	MULTIPLE MYELOMA, ANEMIA	++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								156	11.7	18	1.53	1.53	32.5	51.4	1.581538462			-	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
25	**1129526**	**PRE-DIALYSIS**	52	M	10.72	86	9.805140962	1 year	7.6	108	11.7	11.9	1.02	1.02	32.5	28.4	0.873846154	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	Hypertension	+++	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								99	11.7	19.3	1.64	1.64	32.5	55.6	1.710769231			+	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
26	**1131929**	**PRE-DIALYSIS**	48	M	19.6	95	6.193310658	3 years	11	145	11.7	16.9	1.44	1.44	32.5	34.3	1.055384615	HYPERTENSIVE NEPHROSCLEROSIS	ISCHEMIC HEART DISEASE,	++++	GRADE 1	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								130	11.7	44.2	3.77	3.77	32.5	39.9	1.227692308			+++	GRADE 1	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
27	**1114315**	**PRE-DIALYSIS**	51	F	7.52	50	6.986000296	7 years	12.9	180	11.7	12.4	1.06	1.06	32.5	67.2	2.067692308	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENSION	+++	GRADE 2	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								175	11.7	17.8	1.52	1.52	32.5	70.2	2.16			+++	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
28	**1055665**	**PRE-DIALYSIS**	47	F	9.13	60	7.215224535	8 years	10.9	318	11.7	18.8	1.6	1.6	32.5	33.4	1.027692308	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	NONE	++	GRADE 2	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								320	11.7	19.2	1.66	1.66	32.5	40.2	1.236923077			+++	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
29	**1133739**	**PRE-DIALYSIS**	62	M	8.77	103	12.72329913	2 years	9.1	156	11.7	14.4	1.23	1.23	32.5	31.5	0.969230769	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	ISCHEMIC HEART DISEASE, LUPUS,	+++	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								135	11.7	20.1	1.72	1.72	32.5	39.1	1.203076923			+++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
30	**1130225**	**PRE-DIALYSIS**	72	M	5.78	110	17.97385621	8 years	6.6	404	11.7	11.5	0.98	0.98	32.5	51.2	1.575384615	HYPERTENSIVE NEPHROSCLEROSIS	Diabetes, Hypertension,	+++	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								392	11.7	19.2	1.64	1.64	32.5	45.3	1.393846154			++	GARDE 2	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
31	**1091337**	**PRE-DIALYSIS**	57	M	6.64	112	19.44444444	3 years	10	164	11.7	12.6	1.08	1.08	32.5	41.4	1.273846154	IGA NEPHROPATHY	PSORIASIS	+++	GRADE 2	ABSENT	PRESENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT
		POST-DIALYSIS								150	11.7	18.2	1.55	1.55	32.5	40.1	1.233846154			+++	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT

32	**1128628**	**PRE-DIALYSIS**	54	F	12.3	55	4.539859982	7 years	7.8	265	11.7	11.6	0.99	0.99	32.5	29.8	0.916923077	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENSION, ANEMIA	-	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								240	11.7	10.1	0.84	0.84	32.5	41.6	1.28			-	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT
33	**1110093**	**PRE-DIALYSIS**	54	F	2.03	60	30.00821018	4 years	9.6	394	13.4	19	1.42	1.47	36.4	33.4	0.917582418	Diabetic Nephropathy	Diabetes, Hypertension	-	GRADE 4	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								352	11.7	15.8	1.35	1.35	32.5	41.8	1.286153846			-	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
34	**1041911**	**PRE-DIALYSIS**	65	M	4.61	59	13.33152567	5 years	12	149	11.2	16.3	1.46	1.45	32.5	36.5	1.123076923	Diabetic Nephropathy	HYPERTENSION, DIABETES ISCHEMIC	-	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	ABSENT
		POST-DIALYSIS								133	11.7	22.1	1.89	1.89	32.5	32.7	1.006153846			-	GRADE 3	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT
35	**1049915**	**PRE-DIALYSIS**	78	M	2.87	80	24.00309717	8 years	14.3	158	11.7	12.2	1.08	1.08	32.5	37.4	1.150769231	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	MULTIPLE MYELOMA, ANEMIA	++++	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								178	11.7	17.1	1.47	1.47	32.5	78.2	2.406153846			+++	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
36	**1071341**	**PRE-DIALYSIS**	40	F	6.7	56	9.867330017	1 year	8.9	134	11.7	13	1.11	1.11	32.5	36.6	1.126153846	Diabetic Nephropathy	Diabetes, Hypertension	+++	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT	PRESENT
		POST-DIALYSIS								102	11.7	14.6	1.25	1.25	32.5	37.2	1.144615385			++	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT
37	**1135340**	**PRE-DIALYSIS**	52	M	4.3	75	21.31782946	5 years	10.2	257	11.7	10.3	0.88	0.88	32.5	33.3	1.024615385	Diabetic Nephropathy	HYPERTENSION, DIABETES	+	GRADE 2	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								233	11.7	12.5	1.07	1.07	32.5	44.1	1.356923077			-	GRADE 1	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT
38	**1130572**	**PRE-DIALYSIS**	55	M	4.8	68	16.72453704	3 years	9.7	104	11.7	11.2	0.96	0.96	32.5	44.2	1.36	CHRONIC GLOMERULOUS NEPHRITIS	Diabetes, Hypertension	+	GRADE 2	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								100	11.7	13.2	1.13	1.13	32.5	40.2	1.236923077			-	GRADE 2	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT
39	**887184**	**PRE-DIALYSIS**	28	F	12.3	47	5.052393857	2 and half years	7.7	155	11.7	11.2	0.97	0.97	32.5	32.8	1.009230769	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENSION, SEVERE ANEMIA	+++	GRADE 4	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								116	11.7	14.2	1.23	1.23	32.5	33.2	1.021538462			+	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	PRESENT
40	**1099625**	**PRE-DIALYSIS**	32	F	11.1	70	8.040540541	3 years	7.3	80	11.7	11.5	0.99	0.99	32.5	41.8	1.286153846	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	HYPERTENSION	++	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								55	11.7	18.3	1.56	1.56	32.5	40.4	1.243076923			-	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT
41	**1120082**	**PRE-DIALYSIS**	29	F	15.2	52	4.483004386	1 year	8.6	185	11.7	11.9	1.03	1.03	32.5	38	1.169230769	LUPUS NEPHRITIS	LUPUS	++	GRADE 1	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								143	11.7	13.5	1.16	1.16	32.5	45.5	1.4			+	GRADE 1	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT		PRESENT
42	**1090200**	**PRE-DIALYSIS**	59	F	6.4	71	10.60839844	7 years	8.1	266	11.7	13	1.12	1.12	32.5	33.2	1.021538462	Diabetic Nephropathy	Diabetes, Hypertension	+	GARDE 1	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								221	11.7	10	0.86	0.86	32.5	40.5	1.246153846			-	GRADE 1	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT
43	**1062724**	**PRE-DIALYSIS**	54	F	7.3	51	7.09303653	4 years	5	201	11.7	11.5	0.99	0.99	32.5	34.3	1.055384615	Diabetic Nephropathy	HYPERTENSION, ANEMIA	+	GRADE 3	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT
		POST-DIALYSIS								160	11.7	11.9	1.01	1.01	32.5	39.8	1.224615385			-	GARDE 2	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT	PRESENT	PRESENT
44	**1093425**	**PRE-DIALYSIS**	32	F	11.5	62	6.873913043	2 years	11	273	11.7	11.4	0.9	0.9	32.5	39.3	1.209230769	LUPUS NEPHRITIS	LUPUS, HYPERTENSION	++++	GRADE 3	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								243	11.7	17	1.45	1.45	32.5	60.8	1.870769231			++	GRADE 2	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
45	**1119651**	**PRE-DIALYSIS**	50	F	7.98	66	8.787593985	5 months	9.7	252	11.7	10.2	0.88	0.88	32.5	38	1.169230769	Diabetic Nephropathy	Diabetes, Hypertension	+	GRADE 2	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								213	11.7	18.2	1.56	1.56	32.5	40.2	1.236923077			-	GARDE 2	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT	ABSENT	PRESENT
46	**1106958**	**PRE-DIALYSIS**	58	F	8.86	67	7.320510409	6 months	11.2	302	11.7	11.7	1	1	32.5	34.5	1.061538462	Diabetic Nephropathy	Diabetes, Hypertension	++	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT
		POST-DIALYSIS								278	11.7	22.9	1.99	1.99	32.5	46.9	1.443076923			-	GRADE 2	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT
47	**1091667**	**PRE-DIALYSIS**	72	F	4	80	16.05555556	8 years	8.5	268	11.7	12.4	1.06	1.06	32.5	55.7	1.713846154	CHRONIC TUBULOINTERSTITIAL NEPHRITIS	Hypertension	-	GARDE 3	ABSENT	PRESENT	PRESENT	PRESENT	PRESENT	ABSENT	PRESENT
		POST-DIALYSIS								230	11.7	11.9	1.02	1.02	32.5	60.2	1.852307692			-	GRADE 3	ABSENT	PRESENT	ABSENT	PRESENT	ABSENT	ABSENT	PRESENT
48	**1052334**	**PRE-DIALYSIS**	54	F	5.7	74	13.18079922	9 years	12.1	255	11.7	11.2	0.97	0.97	32.5	32.8	1.009230769	Diabetic Nephropathy	Diabetes, Hypertension, HYPOTHYROIDISM	-	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	PRESENT	ABSENT	ABSENT

		POST-DIALYSIS								201	11.7	17.4	1.49	1.49	32.5	40.2	1.236923077			-	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT
49	**1063504**	**PRE-DIALYSIS**	54	M	12.2	70	6.853369763	7 years	11.5	174	11.7	11.5	0.99	0.99	32.5	41.8	1.286153846	HYPERTENSIVE NEPHROSCLEROSIS	HYPERTENSION	+	GRADE 4	ABSENT	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT
		POST-DIALYSIS								145	11.7	18.3	1.57	1.57	32.5	50.3	1.547692308			-	GARDE 3	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT	ABSENT
50	**1072117**	**PRE-DIALYSIS**	72	M	11.6	74	6.024904215	2 years	7.2	155	11.7	12.7	1.09	1.09	32.5	29.5	0.907692308	Diabetic Nephropathy	Diabetes, Hypertension	+++	GARDE 3	PRESENT	PRESENT	PRESENT	ABSENT	ABSENT	ABSENT	PRESENT
		POST-DIALYSIS								134	11.7	11.9	1.1	1.1	32.5	35.3	1.086153846			+++	GRADE 2	ABSENT	PRESENT	ABSENT	ABSENT	ABSENT	ABSENT	PRESENT