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بسم الله الرحمن الرحيم

الجمهورية اليمنية
وزارة التعليم العالي والبحث العلمي
الجامعة الإماراتية الدولية
كلية الطب

Risk Factors for the End Stage Renal Failure among Patients on Kidney Dialysis Center - Al-Thawra Hospital, Sana'a. (2022)

A research submitted to the department of community medicine, faculty of medicine and health sciences, Emirates International University, in partial fulfillment for the degree of MBBH in general medicine and surgery.

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قسم الطب البشري

بسم الله الرحمن الرحيم

عوامل الخطورة للمرحلة النهائية من الفشل الكلوي بين مرضى مركز غسيل الكلى - مستشفى الثورة العام بصنعاء. (2022)

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From the patient's pain, we went to relieve them of their pain, and from the groans, we heard in the alleys of the hospital…
We made a covenant that we would help them and would not forget them.
Among the efforts of our doctors, we made efforts to inform them of the results of their tiredness…
Our research was the result of pain, so came to relieve it; and from ambitions to fulfill it, and a clear vision to prove it.

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Dedication

We dedicate this search to a

Our beloved country [Yemen]:
That we have always sought to serve and our souls strive to advance scientifically and practically.

Parents:
Here we are today, reaching fulfillment your hopes for us; thanks to Allah and thanks to your prayers that accompany us as a permanent shadow.

Years of our lives:
That passed between effort, fatigue, bitterness of science and learning, cruelty of war and struggle with life.

Our University:
That embraced us in its paws and between its ribs for years.

Our Doctors:
Whom taught us and helped us achieve the Bachelor's degree.

The patients:
Whom suffer from kidney diseases and has risk factors for renal failure in advance.

Abstract

Background: Renal failure is a medical condition in which the kidneys are functioning at less than 15% of normal levels. ESRF is irreversible impaired in kidney function, resulting to permanent reduction in glomerular filtration rate. Worldwide the prevalence of ESRF differs greatly; more than 16% of the world's population effected by CKD, and these people are at highest risk of developing ESRF. There is a limitation on the studies about the causes and risk factors of ESRF in Yemen, so this study was designed to study the risk factors of ESRF using the case control design.

Objective: The general objective of this study was to determine the risk factors of ESRF.

Methods: A hospital-based case-control study (90 cases and 180 controls) was conducted in the Hemodialysis Center in Al-Thawra Hospital - Sana'a, Yemen during February 2022. Cases were patients with diagnosed ESRF within the last five years, who attended the hemodialysis center in Al-Thawra Hospital in Sana'a. While controls were from the relatives of the patients, who are healthy persons without end-stage renal disease (ESRD) who related to patient's family of first or second degree with the same age and gender. Stander questionnaire was used to collect the data that include sociodemographic data and data about the risk factors. The data was analyzed using SPSS version 21.

Result: A total of 90 cases and 180 controls were included in this study; the majority of the both groups were at middle age and married. Males were slightly higher than females in the two groups. Regarding economic status more than 3 fourth of the case group were at insufficient status, and major of case group are educated. Regarding to the History of renal failure in the family the result showed that, in the cases group 21.1%, while in the control group only 16.1%. There was no important difference in the social habits including smoking, using shamah and chewing qat between the two groups, as difference was not statistically significance. Regarding to the history of the chronic diseases the result showed that there was important difference between the two groups and this difference was statistically significant for some diseases such as, Hypertension (64. 4%, 13.3% respectively, and p.value less than 0.001), diabetes (22.2%, 11.7% respectively and p. value 0.03), and CVDs (18.9%, 5.6 and p.value 0.03). Regarding to the history of kidney diseases the result showed that there was important difference between the two groups and this difference was statistically significant for some diseases such as, kidney stone in cases and controls (25. 6%, 11.7% respectively, and p.value =0.005), UTI (37.8%, 7.8 and p.value <0.001), the urinary tract obstruction (15.6%, 1.7% and p.value <0.001), hereditary kidney disease (4.4%, 0.0% and p.value =.0.01) and urinary tract operation (18.9%, 4.4% and p.value <0.001). and using sedatives was (32.2%, 11.7 & p.value <0.001). While there was no important difference between the two groups for other diseases such as, liver cirrhosis, HIV and autoimmune disease.

Conclusion: There was strong relationship between the history of some chronic diseases such as, hypertension, D.M, CVDs and urinary tract infections and developing ESRF. Also there was strong relationship between the history of the excessive use of analgesic medication and developing ESRF.

Abbreviation

ACE :	Angiotensin converting enzyme.
AIDS :	Acquired immunodeficiency syndrome.
AKI :	Acute kidney injury.
ANA:	Antinuclear resonance angiography.
Anti-GBM:	Anti-glomerular basement membrane.
APD :	Automated peritoneal dialysis.
ARB_s :	Angiotensin 2 receptor blocker.
ARF :	Acute renal failure.
BMI :	Body mass index.
Bp :	Blood pressure.
BUN:	Blood urea nitrogen.
C-ANCA:	Cytoplasmic anti-neutrophil cytoplasmic antibody.
CAPD :	Continuous ambulatory peritoneal dialysis.
CBC :	Complete blood content.
CI:	Confidence interval.
CKD:	Chronic kidney disease.
CRF:	Chronic renal failure.
CT:	Computed tomography.
CVDs :	Cardiovascular diseases.
DNA:	Deoxyribonucleic acid.
ESA :	Erythropoiesis stimulating agent.
ESKD:	End stage kidney disease.
ESRD:	End stage renal disease.
ESRF:	End stage renal failure.
EU:	European union.
FSGS :	Focal segmental glomerulosclerosis.
GFR:	Glomerular filtration rate.
HBV:	Hepatitis B virus.
HCV:	Hepatitis C virus.
HIV:	Human immunodeficiency virus.
HLA :	Human leucocyte antigen.
IgA :	Immunoglobulin A.
K^+ :	Potassium.
KDIGO	Kidney Disease Improving Global Outcomes.
MRA :	Magnetic resonance angiography.

N:	Number.
NSAID:	Non-steroidal anti-inflammatory drug.
OR:	Odds ratio.
P.value:	Probare value.
P-ANCA:	Perinuclear anti-neutrophil cytoplasmic antibody.
Pmp:	Per million population.
PTH:	Parathyroid hormone.
RRT:	Renal replacement therapy.
SD:	Stander deviation.
$SGLT_2$:	Sodium-glucose transporter 2.
SLE :	Systemic lupus erythematous.
U.K :	United Kingdom.
USA:	Unite State American.
UTI:	Urinary tract infection.

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Chapter 1: *Introduction*

Background

Kidney failure is a medical condition in which the kidneys are functioning at less than 15% of normal levels.[1] Kidney failure is classified as either acute kidney failure, which develops rapidly and may resolve; or chronic kidney failure, which develops slowly and can often be irreversible. [2]

Acute kidney injury (previously known as acute renal failure) is a sudden and often reversible loss of renal function, which develops over days or weeks and is often accompanied by a reduction in urine volume.[3] Usually occurs when the blood supply to the kidneys is suddenly interrupted or when the kidneys become overloaded with toxins. Generally characterized by oliguria (urine less than 400 ml per day in adults or less than 0.5 ml/kg/h in children) and fluid and electrolyte imbalance.[4]

AKI can result from a variety causes, generally classified as pre-renal, intrinsic and post-renal. However, the common causes are accidents (crush syndrome), injuries, low blood pressure, dehydration, hemolytic uremic syndrome, certain medication or complications from surgeries in which the kidneys are deprived of normal blood flow for extended periods of time.[2]

Diagnosis often based on combination of factors such as decreased urine production or increased serum creatinine. [5] People suffering from acute kidney injury require supportive treatment (depends on the underlying cause) until their kidneys recover function .unlike chronic kidney disease, the most cases of AKI will recover after the insult resolves but recovery may be impaired in pre-existing CKD or a prolonged severe insult. Recovery is heralded by a gradual return of urine output and a steady improvement in plasma biochemistry. Initially, there is often a diuretic phase in which urine output increases rapidly and remains excessive for several days before returning to normal. This may be due in part to tubular damage and to temporary loss of the medullary concentration gradient. After a few days, urine volume falls to normal as the concentrating mechanism and tubular reabsorption are restored.[3]

Chronic kidney disease (CKD) refers to an irreversible deterioration in renal function that progresses slowly over at least three months and can lead to permanent renal failure.[6] usually develops over a period of years. [3] This resulting to permanent reduction in the glomerular filtration rate (GFR). In end stage renal failure (ESRF) the glomerular filtration rate (GFR) is <15 (mL/min/1.73 m^2) or albuminuria is very high (>300 mg albumin/24 h). [7]

The kidneys can no longer remove wastes, regulate and concentrate urine, where body fails to maintain metabolic and electrolytic balance, resulting in uremia, metabolic acidosis, anemia, electrolyte imbalances and endocrine disorders.

Epidemiology of ESRF:

The Epidemiologic research has demonstrated that there is an increase in incidence, prevalence and complications of this disease. It is an important increased health problem in the world. The progression of end-stage renal disease (ESRD) has caused a yearly exponential rise in new patients. [8]

End-stage renal disease (ESRD) is increasing worldwide. Renal replacement therapy (RRT) and kidney transplantation are increasing the burden on health systems. This condition is particularly serious in the developing countries where health resources are inadequate. [9]

Worldwide, the number of patients receiving RRT is estimated at more than 1.4 million, with the annual incident rate growing to 8%.[10]

The incidence of renal failure common in African-American, old age, low birth weight and more in male than female.

The incidence of chronic kidney disease (CKD) are common in population with old age, diabetes mellitus and hypertension and medications, such as the use of analgesics (NSAID) regularly over long durations of time resulting in analgesic nephropathy and kidney damage. Polycystic kidney disease is an example of a hereditary cause of CKD.[11] Diabetes is the largest single cause of ESRD in the United Kingdom, accounting for 30-40% of all cases.[12]

The prevalence of CKD in patients with hypertension, diabetes and vascular disease is substantially higher, and targeted screening for CKD should be considered in these and other high-risk groups. More than 25% of the population aged over 75 years have GFR of < 60 mL/min/1.73 m^2, mostly stage 3A CKD, which in this context typically reflects an increased cardiovascular risk burden.[3]

Worldwide, the prevalence of ESRD differs greatly. The kidney failure was estimated more than 16% of the world's population effected by CKD, and these people are at highest risk of developing ESRF. [13] The average of incidence of new patients treated due to ESRD in EU during years (1995) was (120) persons per million populations, ranging (68) in Finland, (163) in Germany. These figures are higher in USA with (262) person per million population, Japan (210) person per million population, but lower in Canada (140) person per million population during the same year. [14] In Europe, the prevalence has increased from 760 pmp in 2004 to 889 pmp in 2008. [15]

According the United States Renal Data System, the highest prevalence was found in Taiwan, with 2447 patients per million (pmp), and the lowest prevalence was in Philippines, at 110 pmp. In the United States, the prevalence was 1811 pmp. [16]

Regionally, Study was conducted during 2006 to study the average incidence rate of ESRD in 10 countries in the Eastern Mediterranean Region including Yemen, the result showed that average incidence rate of ESRD in these 10 countries the was 93 patients per million people. The lowest prevalence was in Kuwait, with 80 patients per million people, Jordan 120, Egypt 235, Lebanon 243, Qatar 262 and the highest was in Saudi Arabia and Yemen, with 462 and 320 patients per million people, respectively. Diabetes mellitus was the most frequently reported cause of ESRD in almost of these countries, accounting for 20%–40% of the cases, followed by hypertension (accounting for 11%–30%) and glomerulonephritis (accounting for 11%–24%).[8]
In many Arab countries, obstructive uropathy constitutes a major cause of ESRD (40%). The two most common underlying causes are renal calculi and schistosomiasis. In many developing countries, chronic glomerulonephritis is often caused by infections and infestations, and is a leading cause of CKD.[17]

Nationally, many studies have done in the country, and almost of these studeis were interested in studying the incidence of renal failure, and the result of these studies showed the chronic renal failure (CRF) is a growing problem in Yemen. Some of these studies studied the proportion of the causes among the patients using the cross-sectional study design.
Between January 1998 and December 2002, 547 patients were admitted to the Science & Technology University Hospital, Sana'a (the capital city) including children with acute renal failure and CRF.[18] And 334 end-stage renal disease (ESRD) patients were treated during three years (from January 2004 to June 2007) in Central Military of Sana'a. [19]
Study was conducted in Ibn-Sina Teaching Hospital in Hadramout, Yemen on 51 patients with CRF on regular hemodialysis at April 2006. The result showed the proportions of the causes among these patients as the following, Glomerulonephritis (25.4%) was the commonest cause of CRF, followed by obstructive nephropathy (13.7%), hypertension (11.8%), pyelonephritis (11.8%), diabetic nephropathy (7.8%), arthritis, malaria, vasculitis and postpartum hemorrhage (5.9% each) and the least common one was Alport's syndrome (3.9%).[20] Other study conducted during January 2016, in Al-Thawra General Hospital, Sana'a to estimate the underlying primary diseases of chronic renal failure (CRF) among total number of patient 566. The result showed that majority of CKD cases were males. In addition, most causes are hypertension (43.2%), followed by infections (such as malaria, schistosomiasis and bacterial infections) (19%) and obstructive nephropathy (17.9%).[21]

As Yemen is a tropical country, malaria (27.9%), diarrhea (13.6%) and other infectious diseases were the main causes of renal failure, the incidence might probably be higher in other governorates in Yemen, such as Hodeida, because of the high prevalence of malaria, schistosomiasis, and renal stones and a low socioeconomic status.[22]

Study Justification:

Chronic Renal Failure (CRF) is becoming an increasing burden in all regions of the world especially in the developing countries including Yemen. Also CRF has serious impact on quality of patient's life.

Currently the country living one of the worst human suffering resulting to the current war in the country. In addition to the weakness of the health system and the low economic status of the people, so the CRF patients are facing many difficulties in their live.

There are many deficiencies of the diagnostic and therapeutic tools available in our country for chronic renal failure (CRF) which can increase the risk of the death among these group.

Many risk factors of CRF are preventable, so this study was designed to determine the main risk factors for the problem, and the result will provide clear understanding about these risk factors. This will help in increasing the awareness toward this problem, and draw attention of the decision makers toward it.

Study Objectives:

General:

This study was design to determine the risk factors of the end stage of renal failure (ESRF) on kidney dialysis center in Al-Thawra Hospital Sana'a.

Specific:

1. To determine the characteristics of sample under study.
2. To determine the main risk factors of the end stage renal failure.
3. To measure the association level between the risk factors and the end stage renal failure.

Chapter 2: *Literatures Review*

Pathophysiology of Renal Failure:

Each nephron in a normal kidney contributes to the total glomerular filtration rate (GFR). The decline of kidney function is gradual and initially may present asymptomatically. The natural history of renal failure depends on the etiology of the disease but ultimately involves early homeostatic mechanisms involving hyperfiltration of the nephrons. The kidney maintains GFR, despite progressive destruction of nephrons, because the remaining normal nephrons develop hyperfiltration and compensatory hypertrophy. As a result, the patient with mild renal impairment can show normal creatinine values, and the disease can go undetected for some time.[23]

This nephron adaptability allows for continued normal clearance of plasma solutes. This adaptive mechanism will run its course and eventually cause damage to the glomeruli of the remaining nephrons. At this point, antihypertensive such as ACEs or ARBs may be beneficial in slowing the progress of the disease and preserving renal function. Plasma levels of substances such as urea and creatinine start to show measurable increases only after total GFR has decreased 50%. For example, a rise in plasma creatinine from 0.6 mg/dl to 1.2 mg/dl in a patient, although within the normal range, actually represents a loss of 50% of functioning nephron mass. Although hyperfiltration and hypertrophy of residual nephrons are beneficial for the maintenance of GFR, it is found to be a major cause of progressive renal dysfunction. The increased glomerular capillary pressure may damage the capillaries, leading to focal segmental glomerulosclerosis (FSGS) and eventually to global glomerulosclerosis.[24]

Stages of kidney diseases:

Chronic kidney diseases is measured in five stages, which are calculated using the glomerular filtration rate. Stage 1 CKD is mildly diminished renal function, with few overt symptoms. Stages 2 and 3 need increasing levels of supportive care from their medical providers to slow and treat their renal dysfunction. People with stage 4 kidney usually require preparation towards active treatment in order to survive. Stage 5 CKD is considered a severe illness and requires some form of renal replacement therapy (dialysis) or kidney transplant whenever feasible.[25]

According to KDIGO 2012 clinical practice guideline, CKD is classified into five stages considering the GFR level.[26]

- Stage 1: Kidney damage with normal GFR (greater than 90 ml/min).
- Stage 2: Mild reduction in GFR (60-89 mL/min).
- Stage 3a: Moderate reduction in GFR (45 to 59 mL/min).
- Stage 3b: Moderate reduction in GFR (30 to 44 mL/min).
- Stage 4: Severe reduction in GFR (15 to 29 mL/min).
- Stage 5: Renal failure (GFR less than 15 mL/min).

- *Glomerular filtration rate:*

A normal GFR varies according to many factors, including sex, age, body size and ethnic background. Renal professionals consider the glomerular filtration rate (GFR) to be the best overall index of kidney function.[27] The National Kidney Foundation offers an easy to use on-line GFR calculator [28] for anyone who is interested in knowing their glomerular filtration rate.

$GFR = \frac{(140-\text{age}) \text{ x weight(kg)}}{72 \text{ x Scr(mg/dl)}}$ $[ml/min]$ × 0.85 (if female).

Etiology and Risk Factors of Renal Failure:

CRF may result from many different causes; the main causes are the following: [24]

1) Diabetes mellitus.
2) Hypertension.
3) Vascular disease (hypertensive nephrosclerosis, renal artery stenosis and renal vein thrombosis).
4) Glomerular disease:
   - *Primary Glomerular Diseases* (Membranous nephropathy, Alport syndrome, Immunoglobulin A (IgA) nephropathy, Focal and segmental glomerulosclerosis, Minimal change disease, Membranoproliferative glomerulonephritis and rapidly progressive (crescentic) glomerulonephritis).
   - *Secondary Glomerular Diseases* (Diabetes mellitus, Systemic lupus erythematosus, Rheumatoid arthritis, Mixed connective tissue disease, Scleroderma, Wegener granulomatosis, Mixed cryoglobulinemia, Endocarditis, Hepatitis B and C, Syphilis, HIV, Amyloidosis, Thrombotic thrombocytopenic purpura and Henoch-Schönlein purpura).
5) Hereditary (polycystic kidney disease and medullary cystic disease).
6) Tubulointerstitial disease (analgesic nephropathy, multiple myeloma, reflux nephropathy, chronic pyelonephritis, tuberculosis and nephrotoxins as heavy metals).
7) Urinary tract obstruction (benign prostatic hypertrophy, kidney stones, urethral stricture, tumors, neurogenic bladder, retroperitoneal fibrosis and congenital defects of the kidney or bladder).

Moreover, many risk factors that lead to the onset of ESRD such as old age, race, male gender, and family history of kidney disease, obesity, hypertension, and diabetes mellitus, cardiovascular disease, and hyperlipidemia. In addition, exposure to heavy metals, excessive alcohol consumption, smoking, liver cirrhosis, HIV infection, and the excessive use of analgesic medications are further risk factors.[29]

Symptoms and Signs of Renal Failure:

Symptoms can vary from person to person. Someone in early stage kidney disease may not feel sick or notice symptoms as they occur. When the kidneys fail to filter properly, waste accumulates in the blood and the body, this condition called azotemia. If the disease progresses and symptoms become noticeable this condition called uremia.[30]

Symptoms of kidney failure include the following: [31, 32, and 33]

High levels of urea in the blood, which can result in:

- Nausea.
- Vomiting or/and diarrhea.
- Weight loss.
- Nocturnal urination (nocturia).
- Polyuria or anuria.

A buildup of phosphates in the blood that diseased kidneys cannot filter out may cause:-

- Itching.
- Muscle cramps.

A buildup of potassium in the blood that diseased kidneys cannot filter out (called hyperkalemia) may cause:

- Abnormal heart rhythms.
- Muscle paralysis.

Failure of kidneys to remove excess fluid may cause:

- Edema of the hands, legs, ankles, feet, or face.
- Shortness of breath (dyspnea).

Fail the kidneys to produce erythropoietin resulting in anemia. This can cause:

- Feeling tired or weak.
- Memory problems.
- Difficulty concentrating.
- Dizziness.
- Low blood pressure.

Pass the protein through glomeruli and execration in urine. This can result in:

- Foamy or bubbly urine.
- Swelling in the hands, feet, abdomen, and face.

Other symptoms include:

- Appetite loss.
- Difficulty sleeping.
- Darkening of the skin.
- Amenorrhea in female and erectile impotence.

Diagnosis and Investigation of Renal Failure:

Chronic kidney disease is diagnosed when there is evidence of kidney damage for at least three months or in any patient with a GFR of less than 60 mL/min for that same amount of time.[34 & 35] The diagnostic procedures for renal failure include the following: [24]

1. Complete medical history and physical examination.
2. Laboratory investigation:
   - CBC shows normochromic normocytic anemia.
   - Blood urea nitrogen (BUN) and serum creatinine levels are elevated.
   - Hyperkalemia, low bicarbonate and Serum albumin level.
   - Serum phosphate, 25-hydroxyvitamin D, alkaline phosphatase, and intact parathyroid hormone (PTH) levels obtained to look for evidence of renal bone disease.
   - Urinalysis to quantitate albuminuria and a spot urine protein/creatinine ratio.
3. Imaging modalities:
   - Renal Ultrasonography shows small, echogenic kidneys in advanced renal failure. While in diabetic nephropathy, the kidneys are normal in size. In addition, can detect Structural abnormalities like polycystic kidneys, and provide data estimating size, obstructions, stones, echogenicity, and cortical thinning.
   - Plain abdominal radiography can detect radio-opaque stones or nephrocalcinosis.
   - Cystourethrogram is diagnostic for vesicoureteral reflux.
   - Computed tomography (CT) scanning can help in a better description of renal masses and cysts and is sensitive for identifying renal stones.
   - Magnetic resonance angiography (MRA) can accurately diagnose renal artery stenosis.
4. Renal Biopsy: percutaneous ultrasound-guided renal biopsy is indicated when the diagnosis is unclear after an appropriate workup.
5. Specific Tests:
   - Serum and urine protein electrophoresis for multiple myeloma.
   - Antinuclear antibodies (ANA), double-stranded DNA antibody levels and Serum complement levels for systemic lupus erythematosus.
   - Cytoplasmic and perinuclear pattern anti-neutrophil cytoplasmic antibody (C-ANCA and P- ANCA) levels for granulomatosis with polyangiitis (Wegener granulomatosis) and microscopic polyangiitis.
   - Anti–glomerular basement membrane (anti-GBM) antibodies for Goodpasture syndrome.

Complications of Renal Failure:

- Coronary heart disease is a significant complication of chronic kidney disease and is the most common cause of death in this population. Patients on dialysis have a 10 to 30 times higher cardiovascular mortality risk than in the general population.[36]
- Peripheral vascular disease is also common.[37]
- Hypertension.
- Mineral and bone disorders (secondary to hyperparathyroidism, vitamin D deficiency).
- Growth impairment.
- Hyperuricemia.
- Metabolic acidosis.
- Hyperphosphatemia.
- Hypoalbuminemia.
- Anemia.
- Decreased libido, erectile dysfunction.

Complications Due to Vascular Access/Dialysis [24]

- Bleeding.
- Local or disseminated intravascular infection.
- Graft occlusion.
- Electrolyte abnormalities after dialysis.
- Dialysis dementia.
- Dialysis disequilibrium syndrome

Management of Renal Failure:

Management of CRF include the following points: [24 & 38]

▷ Treating the underlying cause such as:

- Blood pressure should be targeted to a systolic blood pressure less than 130 mmHg and diastolic blood pressure less than 80 mmHg in adults with or without diabetes mellitus whose urine albumin excretion exceeds 30 mg for 24 hours. For diabetic patients with proteinuria, an angiotensin-converting enzyme inhibitor (ACEI) or angiotensin 2 receptor blocker (ARB) should be started in cases where urine albumin values range between 30 and 300 mg in 24 hours and greater than 300 mg in 24 hours. These drugs slow the disease progression, particularly when initiated before the GFR decreases to less than 60 ml/min or before plasma creatinine concentration exceeds 1.2 in women and 1.5 in men.[39]
- Type 2 diabetes mellitus management with sodium-glucose transporter 2 (SGLT-2) inhibitors may reduce the disease burden.[40]

▷ Lifestyle and dietary modification include

- Protein restriction 0.8 g/kg per day.
- Smoking cessation.
- Potassium restriction.
- Phosphorous restriction.
- Water and salt restriction < 2 g/day.

▷ Management of complication:

- Treatment of chronic metabolic acidosis with supplemental renal bicarbonate also may slow the progression of end-stage renal disease.[41]
- Dyslipidemia, particularly hypertriglyceridemia: monitoring fasting lipid panels and initiation of cholesterol-lowering agents such as HMG-CoA reductase inhibitors should be done early in the course of the disease.[42]
- Volume overload or pulmonary edema: is treated with loop diuretics or ultrafiltration.
- Anemia: is treated with an erythropoiesis-stimulating agent (ESA) such as erythropoietin.
- Hyperphosphatemia: is treated with phosphate binders (calcium acetate, sevelamer carbonate, or lanthanum carbonate) and dietary phosphate restriction.
- Hypocalcemia: when a 25-OH vitamin D level less than 10 ng/mL should be initiation of ergocalciferol 50,000 IU weekly for 6 to 8 weeks before switching to cholecalciferol 800 to 1000 IU daily.[43]
- Hyperparathyroidism: is treated with calcitriol and vitamin D analogs.

▷ For uremic manifestations, long-term renal replacement therapy (hemodialysis, peritoneal dialysis, or kidney transplantation).

Food high in potassium:[3]

- Fruit: bananas, avocados, figs, rhubarb.
- Vegetables: tomatoes, spinach, parsnips, courgettes, sprouts, potatoes (including baked, fries, wedges; boiling vegetables reduces potassium content).
- Sweets/snacks: crisps, chocolate, toffee, nuts (including peanut butter)
- Drinks: beer, cider, wine (spirits contain less potassium), hot chocolate, fruit juice, milk, yoghurt.
- Salt substitutes, such as Lo-Salt: sodium chloride is substituted with potassium chloride.

Renal Replacement Therapy:

Renal replacement therapy (RRT) may be required on a temporary basis in patients with ARF or on a permanent basis for those with advanced CRF.
The aim of RRT is to replace the excretory functions of the kidney and to maintain normal electrolyte concentrations and fluid balance. Various options are available, including haemodialysis, peritoneal dialysis and renal transplantation.[3]

***1) Haemodialysis*:** [3]

It is the most common form of RRT in ESRD and is also used in AKI. Haemodialysis involves gaining access to the circulation, through either a central venous catheter or an arteriovenous fistula or graft. The patient's blood is pumped through a haemodialyzer, which allows bidirectional diffusion of solutes between blood and the dialysate across a semipermeable membrane down a concentration gradient. The composition of the dialysate can be varied to achieve the desired gradient, and fluid can be removed by applying negative pressure to the dialysate side. In CKD, vascular access for haemodialysis is gained by formation of an arteriovenous fistula (AVF), usually in the forearm, up to a year before dialysis is contemplated. After 4–6 weeks, increased pressure transmitted from the artery to the vein leading from the fistula causes distension and thickening of the vessel wall (arterialization). Large-bore needles can then be inserted into the vein to provide access for each haemodialysis treatment.

Preservation of arm veins is thus very important in patients with progressive renal disease who may require haemodialysis in the future. If creation of an AVF is not possible, synthetic polytetrafluoroethylene (PTFE) grafts may be fashioned between an artery and a vein, or central venous catheters may be used for short-term access. These are tunnelled under the skin to reduce infection risk.

All patients must be screened in advance for hepatitis B, hepatitis C and HIV, and vaccinated against hepatitis B if they are not immune. All dialysis units should have segregation facilities for hepatitis B-positive patients, given its easy transmissibility. Patients with hepatitis C and HIV are less infectious and can be treated satisfactorily using machine segregation and standard infection control measures. Haemodialysis is usually carried out for 3–5 hours three times weekly, either at home or in an outpatient dialysis unit. The intensity and frequency of dialysis should be adjusted to achieve a reduction in urea during dialysis (urea reduction ratio) of over 65%; below this level, there is an associated increase in mortality. Most patients notice an improvement in symptoms during the first 6 weeks of treatment.

The intensity of dialysis can be increased by:

- escalating the number of standard sessions to four or more per week
- performing short, frequent dialysis sessions of 2–3 hours 5–7 times per week
- performing nocturnal haemodialysis, when low blood pump speeds and single-needle dialysis are used for approximately 8 hours overnight 5–6 times per week.

More frequent dialysis and nocturnal dialysis can achieve better fluid balance and phosphate control, improve left ventricular mass and possibly improve mortality, although the latter has not yet been robustly demonstrated. Table 1 summaries some of the problems related to haemodialysis.

Table 2. 1 Problems with haemodialysis.[3]

Problem	Clinical Features	Cause	Treatment
During Treatments			
- Hypotension	-Sudden ↓BP; often leg cramps; sometimes chest pain.	-Fluid removal and hypovolaemia.	-Saline infusion; exclude cardiac ischaemia; quinine may help cramp
-Cardiac Arrhythmias	-Hypotension; sometimes chest pain.	-Potassium and acid–base shifts	-Check K+ and arterial blood gases; review dialysis prescription; stop dialysis
-Haemorrhage	-Blood loss (overt or occult); hypotension.	-Anticoagulation Venous needle disconnection	-Stop dialysis; seek source; consider heparin-free treatment
-Air Embolism	-Circulatory collapse; cardiac arrest	-Disconnected or faulty lines and equipment malfunction	-Stop dialysis
-Dialyzer Hypersensitivity	-Acute circulatory collapse.	-Allergic reaction to dialysis membrane or sterilisant	-Stop dialysis; change to different artificial Kidney
Between Treatments			
-Pulmonary Edema	-Breathlessness	-Fluid overload	-Ultrafiltration ± dialysis
- Systemic Sepsis	- Rigors; fever; ↓BP	- Usually involves vascular access devices (catheter or fistula)	- Blood cultures; antibiotics

2) Peritoneal dialysis: [3]

Peritoneal dialysis is principally used in the treatment of CKD, though it may occasionally be employed in AKI. It requires the insertion of a permanent Silastic catheter into the peritoneal cavity. Two types are in common use (CAPD & APD). In continuous ambulatory peritoneal dialysis (CAPD), about 2 L of sterile, isotonic dialysis fluid are introduced and left in place for approximately 4–6 hours. Metabolic waste products diffuse from peritoneal capillaries into the dialysis fluid down a concentration gradient.

The fluid is then drained and fresh dialysis fluid introduced, in a continuous four times-daily cycle. The inflow fluid is rendered hyperosmolar by the addition of glucose or glucose polymer; this results in net removal of fluid from the patient during each cycle, due to diffusion of water from the blood through the peritoneal membrane down an osmotic gradient (ultrafiltration).
The patient is mobile and able to undertake normal daily activities. Automated peritoneal dialysis (APD) is similar to CAPD but uses a mechanical device to perform the fluid exchanges during the night, leaving the patient free, or with only a single exchange to perform, during the day.
CAPD is particularly useful in children, as a first treatment in adults with residual renal function, and as a treatment for elderly patients with cardiovascular instability. The long-term use of peritoneal dialysis may be limited by episodes of bacterial peritonitis and damage to the peritoneal membrane, including encapsulating peritoneal sclerosis, but some patients have been treated successfully for more than 10 years. Table (2) summaries some of the problems related to CAPD treatment.

Table 2. 2 Problems with continuous ambulatory peritoneal dialysis. [3]

Problem	Clinical Features	Cause	Treatment
Peritonitis	Cloudy drainage fluid; abdominal pain and systemic sepsis are variable	Usually entry of skin contaminants via catheter; bowel organisms less common	Culture of peritoneal dialysis fluid Intraperitoneal antibiotics, tobramycin, vancomycin Catheter removal sometimes required
Catheter Exit Site Infection	Erythema and pus around exit site	Usually skin organisms	Antibiotics; sometimes surgical drainage
Ultrafiltration Failure	Fluid overload	Damage to peritoneal membrane, leading to rapid transport of glucose and loss of osmotic gradient	Replacement of glucose with synthetic, poorly absorbed polymers for some exchanges (icodextrin)
Peritoneal Membrane Failure	Inadequate clearance of urea etc.	Scarring/damage to peritoneal Membrane	Increase in exchange volumes; consideration of automated peritoneal dialysis or switch to haemodialysis
Sclerosing Peritonitis	Intermittent bowel obstruction Malnutrition	Unknown; typically occurs after many years	Switch to haemodialysis (may still progress) Surgery and tamoxifen may be used

■Indications for dialysis include the following: [24 & 38]

- Severe metabolic acidosis (pH < 7.2).
- Refractory hyperkalemia.
- Uremic symptoms such as Pericarditis, Encephalopathy, seizure or coagulopathy.
- Intractable volume overload.
- Serum creatinine about 10mg/dl and urea 200mg/dl.
- Intractable gastrointestinal symptoms.
- Performed for individuals who had been ingested or exposed to toxic substances.

3) Renal transplantation: [3]

It is the best chance of long-term survival in ESRD and is the most cost-effective treatment. All patients with ESRD should be considered for transplantation but many are not suitable due to a combination of comorbidity and advanced age (although no absolute age limit applies). Active malignancy, vasculitis, cardiovascular disease and a high risk of recurrence of renal disease (generally glomerulonephritis) are common contraindications to transplantation.
Kidney grafts may be taken from a deceased donor in the UK after brain death (40%) or circulatory death (24%), or from a living donor (36%). The matching of a donor to a specific recipient is strongly influenced by immunological factors, since graft rejection is the major cause of transplant failure.

Compatibility of ABO blood group between donor and recipient is usually required and the degree of matching for major histocompatibility antigens, particularly human leucocyte antigen DR (HLA-DR), influences the incidence of rejection. Immediately prior to transplantation, cross matching should be performed for anti-HLA antibodies (traditionally mixing of recipient serum with donor lymphocytes). Positive tests predict early rejection and worse graft survival. Although some ABO- and HLA-incompatible transplants are now possible, this involves appropriate preparation with pre-transplant plasma exchange and/or immunosuppression, so that recipient antibodies to the donor's tissue are reduced to acceptably low levels. This option is generally only available for living donor transplants because of the preparation required. Paired exchanges, in which a donor–recipient pair who are incompatible, either in blood group or HLA, are computer-matched with another pair to overcome the mismatch, also used to help increase the number of successful transplants that can be performed.

During the transplant operation, the kidney placed in the pelvis; the donor vessels usually anastomosed to the recipient's external iliac artery and vein, and the donor ureter to the bladder. The native kidneys usually left in place but may be removed pre-transplant if they are a source of repeated sepsis or to make room for a transplant in patients with very large kidneys due to adult polycystic kidney disease.

All transplant patients require regular life-long follow-up to monitor renal function and complications of immunosuppression.

Immunosuppressive therapy is required to prevent rejection and is more intensive in the early post-transplantation period, when rejection risk is highest. A common regimen is triple therapy with prednisolone; cyclosporine or tacrolimus; and azathioprine or mycophenolate mofetil. Sirolimus is an alternative that can be introduced later but is generally not used initially due to impaired wound healing. Antibodies to deplete or modulate specific lymphocyte populations are increasingly used for induction and for treatment of glucocorticoid-resistant acute rejection. Basiliximab, an interleukin-2 receptor antagonist, is frequently used at induction to lower rates of rejection. Acute cellular rejection is usually treated, in the first instance, by short courses of high-dose glucocorticoids, such as intravenous methylprednisolone on three consecutive days. Anti-lymphocyte preparations (e.g. anti-thymocyte globulin) used for glucocorticoid-resistant rejection. Antibody-mediated rejection is more difficult to treat and usually requires plasma exchange and intravenous immunoglobulin. Complications of immunosuppression include infections and malignancy.

Approximately 50% of white patients develop skin malignancy by 15 years after transplantation.

The prognosis after kidney transplantation is good. Recent UK statistics for transplants from cadaver donors indicate 96% patient survival and 93% graft survival at 1 year, and 88% patient survival and 84% graft survival at 5 years. Even better figures obtained with living donor transplantation (91% graft survival at 5 years).[3]

Figure 2. 1: Hemodialysis machine.

Previous Studies:

This part contains a review of the previous studies in the word that looked at risk factors of end stage renal failure (ESRF).

1. Cohort study was conducted at Kaiser Permanente of Northern California between June 1, 1964 and August 31, 1973.
   The result of this study showed that 842 cases of ESRD were observed during years of follow-up. This comprehensive evaluation confirmed the importance of established risk factors, including the following: male sex, older age, proteinuria, diabetes mellitus, lower educational attainment, African American race, as well as higher blood pressure, body mass index, and serum creatinine level. Furthermore, several independent novel risk factors for ESRD were identified, including lower hemoglobin level, higher serum uric acid level, self-reported history of nocturia and family history of kidney disease. The two most potent risk factors were proteinuria and excess weight.
   This study concluded that lower hemoglobin level, higher serum uric acid level, self-reported history of nocturia, and family history of kidney disease are independent risk factors for ESRD.[44]

2. Case-control study was conducted in Abidjan from January 2006 to December 2006.
   The result of this study showed that a total of 280 patients and 113 controls were included in this study. The mean age of the patients was 37.88 ± 13.33 years and that of the controls was 41.5 ± 9.72 years. Both genders were equally represented. The main causes of CRF were chronic glomerulonephritis (47.48%), with HIV infection accounting for 15% of them, and essential hypertension (25%), similar findings were noted in patients with diabetes (0.35% in CRF, 1% in controls), sickle cell disease (2.5% in CRF, 7.9% in the controls), malaria (42.85% in CRF, 82.3% in the controls), urinary infections (16.4% in CRF, 41.5% in the controls) and kidney disease during pregnancy (32.73% in CRF, 32.78% in the controls).
   This study concluded that hypertension is the main risk factor for CRF in Ivory Coast. HIV also considered as a potential risk factor, although further studies needed to substantiate this observation.[45]

3. Case-control study was conducted at the Erbil City, Iraq between periods from April 2016 to June2017.
   The result of this study showed that nearly matched criteria between two groups were age and gender, the majority of the of both groups were at middle age, the result showed that the majority of case group had history of hypertension 73.3%, recurrent UTI 43.6%, Diabetes 39.6%, Smoking 29.7%, Renal stone 21.8%, and Alcohol drinking 5.9%.

This study concluded that multiple logistic regression of risk factors for end stage renal failure which revealed risk associated were with odds ratio in hypertension O.R=0.191, smoking, O.R=0.085 and past urinary tract O.R=0.030.[46]

4. Case-control study was conducted at Aljomhory hospital, Sa'adah, Yemen from January 1 to February 15, 2016.
   The result of this study showed that a total of 86 cases and 263 controls were included in this study. The mean age was 43.3 years for cases and 32.3 years for controls. In univariate analysis of factors associated with ESRD, patient's aged≥40 years were 3.7 times more likely to have ESRD than younger patients. The odds of ESRD was higher among men than women. Illiteracy was significantly associated with higher odds of ESRD. Hypertension (odds ratio [OR] =8.34), diabetes (OR=3.07), cardiovascular diseases (OR=12.71), presence of urinary stones (OR=21.87), recurrent urinary tract infection (OR=9.64), cigarette smoking (OR=2.44), and shammah use (OR=6.65) were significantly associated with higher odds of ESRD. Hypertension (OR=6.68), urinary stones (OR=16.08), and recurrent urinary tract infection (OR=8.75) remained significantly associated with ESRD in multivariate analysis.
   This study concluded that Hypertension, presence of urinary stones, and recurrent urinary tract infections were significantly associated with ESRF development. Improving the management of hypertension and designing suitable interventions to control problems of the urinary tract would help reduce ESRD prevalence.[22]

5. Descriptive retrospective study was conducted in Abidjan from January 2010 to December 2014.
   The result of this study was collected 252 cases of CKD out of 3573 patients recorded during the study period, yielding a prevalence of 7%. The mean age was 39.6 ± 14 years (15–83 years). We observed a male predominance (sex ratio 1.2:1). Of the CKD patients studied, 67.1% were hypertensive, 7.9% were diabetic, and 8.7% were positive for human immunodeficiency virus (HIV). The etiology of CKD was hypertension in 59.9% of cases, followed by chronic glomerulonephritis (25%), HIV infection (9.1%), and diabetes (4.8%).
   This study concluded that CKD is a common cause of hospitalization in their department. Patients generally consulted at the late stage of the disease. Risk factors are respectively hypertension, (the proportion has more than doubled), HIV infection, and diabetes. These results show the importance of early diagnosis and nephrology monitoring of the disease to slow down progression of CKD.[47]

6. Case-control study was conducted at Kaiser Permanente Northwest at period from January 2000 to December 2004. **The result of this study showed that** analyzed 350 cases and 2,114 controls. Identified the following characteristics that predicted ESRD with odds ratios ≥ 2.0, GFR<60 mL/min/1.73 m2 (OR = 20.5; 95% CI, 11.2 to 37.3), positive test for proteinuria (OR = 5.0; 95% CI, 3.5 to 7.1), hypertension (OR = 4.5; 95% CI, 2.5 to 8.0), positive test for uric acid (OR = 2.5; 95% CI, 1.8 to 3.5), peripheral vascular disease (OR = 2.2; 95% CI, 1.4 to 3.6), congestive heart failure (OR = 2.1; 95% CI, 1.4 to 3.3), and diabetes (OR = 2.1; 95% CI, 1.5 to 2.9). **This study concluded that** the clinical characteristics needed to predict ESRD for example, to develop a population-based, prognostic risk score were often documented during routine care years before patients developed ESRD and required RRT.[48]

7. Cross sectional study was conducted at Northern West Bank, Palestine at 2011. **The result of this study showed that** the study sample (n=293 patients) consisted of 58.7% males, and 41.30% females. The mean age for males was 55.6 years old, while the females mean of age was 54.1 years old. The major risk factors that significantly associated with the onset of ESRD in this study were hypertension 50.8%, Diabetes mellitus 46.4%, cardiovascular disease 31%, recurrent taken analgesic drug, infection of urinary tract 25.6%, Family history of ESRD 18.1%, Renal stone 16.7%, and Congenital anomalies 11.9%. While there were no significant effect for job, gender, smoking, and BMI on onset of ESRD. About 15.5% of all cases developed ESRD because of genetic disease. Polycystic kidney disease cause (11.2%) of ESRD in Northern West Bank. **This study concluded that** Diabetes mellitus, hypertension, cardiovascular disease, recurrent taken non-steroidal anti-inflammatory drug and urinary tract infection were associated significantly with onset of ESRD.[49]

8. Descriptive study was conducted in Najran City-Saudi Arabia during the period from April to July, 2015. **The result of this study showed that** the most affected group of people with renal failure was from 41 to 50 years age group, which represented about 30% of all samples taken from King Khalid Hospital. Hypertensive patients occurred to be highest in 90% of patients with CRF, while the patients with polycystic kidney disease had low risk of renal failure with 20%. Diabetes mellitus was reported in about 70% of patients. Lifestyle, diet and genetic factors are important factors in developing this disease and they are greatly associated with chronic renal failure. **This study concluded that** the risk factors of chronic renal failure among Saudi patients ranged from 15 to 70 years old in Najran City at the King Khalid Hospital and this revealed that the working group of 40 to 50 years old have been greatly affected by the CRF. It might bring by the cause of healthy lifestyle such as poor diet, poor water intake, and lack of exercise or family history. Among the several identified risk factors, hypertension and Diabetes Mellitus has been the most common. Lifestyle, diet and genetic factors played important factors in developing this disease and they are greatly associated with chronic renal failure.[50]

9. Case-control study was conducted in Gaza Strip، Palestine at August 1, 2017.
   The result of this study showed that analyzed 132 patients with ESRD (cases) and 132 patients free from renal problems (controls). The most common modifiable factors associated with ESRD were hypertension (present in 56 cases, 42·4% vs 27 controls, 20·5%), obesity (55, 41·7% vs 45, 34·1%), diabetes mellitus (37, 28·0% vs 22, 16·7%), analgesic drug (29, 22·0% vs 12, 9·1%), kidney stone (28, 21·2% vs 6, 4·5%), glomerulonephritis (26, 19·7% vs 8, 6·1%), and stress (23,17·4% vs 8, 6·1%). ESRD was significantly associated with low socioeconomic status, education, and employment. Multiple logistic analysis controlling for age, sex, and location showed that significant predictors of ESRD were hypertension (OR 42·5, 95% CI 8·26–218·5; p<0·0001), glomerulonephritis (26·19, 4·52–151·5; p<0·0001), obesity (3·99, 1·60–9·94; p=0·003), and low monthly income (4·02, 1·79–9·02; p=0·001).
   This study concluded that hypertension was the most common modifiable factor associated with ESRD. Obesity, diabetes mellitus, analgesic drug and kidney stone were other important associated factors.[51]

10. case-control Study was conducted in Baghdad city during the period from January 1 to February 15, 2016.
    The result of this study showed that a total of 86 cases and 263 controls were included in this study. The mean age was 43.3 (SD 17.7) years for cases and 32.3 (SD 13.0) years for controls. In univariate analysis of factors associated with ESRD, patient's aged≥40 years were 3.7 times more likely to have ESRD than younger patients. The odds of ESRD was higher among men than women. Illiteracy was significantly associated with higher odds of ESRD. Hypertension (odds ratio [OR]=8.34), diabetes (OR=3.07), cardiovascular diseases (OR=12.71), presence of urinary stones (OR=21.87), recurrent urinary tract infection (OR=9.64), cigarette smoking (OR=2.44), and shammah use (OR=6.65) were significantly associated with higher odds of ESRD. Hypertension (OR=6.68), urinary stones (OR=16.08), and recurrent urinary tract infection (OR=8.75) remained significantly associated with ESRD in multivariate analysis.
    This study concluded that Hypertension, presence of urinary stones, and recurrent urinary tract infections were significantly associated with ESRF development. Improving the management of hypertension and designing suitable interventions to control problems of the urinary tract would help reduce ESRD prevalence.[52]

11. Cross sectional Study was conducted in Libya at 2003 to 2012.
    The result of this study showed that in 2003, the reported incidence of ESKD and prevalence of dialysis-treated ESKD in Libya were the same at 200 per million population (pmp). In 2007, the prevalence of dialysis-treated ESKD was 350 pmp, but the true incidence of ESKD was not available. The most recent published WHO data in 2012 showed the incidence of dialysis-treated ESKD had risen to 282 pmp and the prevalence of dialysis-treated ESKD had reached 624 pmp. The leading causes of ESKD were diabetic kidney disease (26.5 %), chronic glomerulonephritis (21.1 %), hypertensive nephropathy (14.6 %) and congenital/hereditary disease (12.3 %).
    This study concluded that ESKD is a major public health problem in Libya with diabetic kidney disease and chronic glomerulonephritis being the leading causes. The most frequent co-morbidities were hypertension, obesity and the metabolic syndrome. In addition to provision of RRT, preventive strategies are also urgently needed for a holistic integrated renal care system.[53]

12. Cross sectional in Libya in May to September 2009.
    The result of this study showed that the prevalence of dialysis-treated ESKD was 624 per million population (pmp). 85% of prevalent patients were aged <65 years and 58% were male. The prevalence of ESKD varied considerably with age with a peak at 55-64 years (2475 pmp for males; 2197 pmp for females). The annual incidence rate was 282 pmp with some regional variation and a substantially higher rate in the South (617 pmp). The most common cause of ESKD among prevalent and incident patients was diabetes. Other important causes were glomerulonephritis, hypertensive nephropathy and congenital or hereditary diseases.
    This study concluded Libya has a relatively high prevalence and incidence of dialysis-treated ESKD.[54]

13. Case control study was conducted in Pakistan in December 2014.
    The result of this study showed the sample of 180 (90 cases and 90 controls) were selected from four different hospitals the average age of the respondents was 45 years, 60% were female, and 40% were male. This study observed that Blood Pressure was a major prevailing characteristic in Chronic Kidney Failure patients 86.7% and in the control group where 30%. It can also be seen that diabetes (63.3% vs 13.3%), Anemia (27.8% vs 11.1%), Heart attack (16.7% vs 10%), Back injury (15.6% vs 5.6 %), Urinary tract infection (15.7% vs 7.8%), Analgesic (42.2% vs 17.8%), Smoking (20% vs 17.8%), Alcohol (3.3% vs 2.2%), Liver Problem (13.3% vs 0%) and Family history (18.9% vs 4.4%).
    This study concludes that Blood pressure, Diabetes, Blood transfusion, Family History, Analgesic, Back Injury, Urinary Tract Infection and Anemia are found to be the significant risk factors of CKF.[55]

Chapter 3: *Methodology*

Study Design:

This study was a hospital based case-control study.

Study Location:

Al-Thawra General Hospital in Yemen, located in Khawlan Street in the center of Sana'a city, which is the largest teaching and referral hospital in Yemen, opened in 1964.
This study was conducted in the hemodialysis center of Al-Thawra hospital,which has more than 30 machines that distributed into three area (negative patients, patients with HBV, and patients with HCV) and received patients from all governorates in Yemen.

Study Period:

The preparatory phase was from 1/1/2022 to 31/1/2022, data collection phase from 1/2/2022 to 10/2/2022 and data analysis and report writing was from 11/2/2022 to 20/5/2022.

Study population:

All the patients with diagnoses of ESRF within the last five years who attend the hemodialysis center in Al-Thawra Hospital in Sanaa, at time from (7:00 AM) to (10:00 PM) according to the matching criteria of the study during period of this study, these patients defined as Cases group.
Control participants are healthy persons without renal failure who related to patient's family of first or second degree with the same age and gender.

Sample size:

The factor of calculating the sample size was (the proportion of the history of diabetes among the controls and cases). The result of previous study was conducted in Erbil city - Iraq in 2017 showed that the proportion of the history of diabetes among the controls and cases were (22.2% and 39.6% respectively).[46]
By using Epi info version 7, unmatched case control sample size design with the following indicators:

- Two sided confidence level 95%,
- Power 80%,
- Ratio of controls to cases 2,
- Present of controls expected 22.2%,
- Odds ratio 2.29,
- Present of cases expected 39.6%

The sample size needed is 89 cases and 178 controls, this sample size rounded to 90 cases and 180 controls.

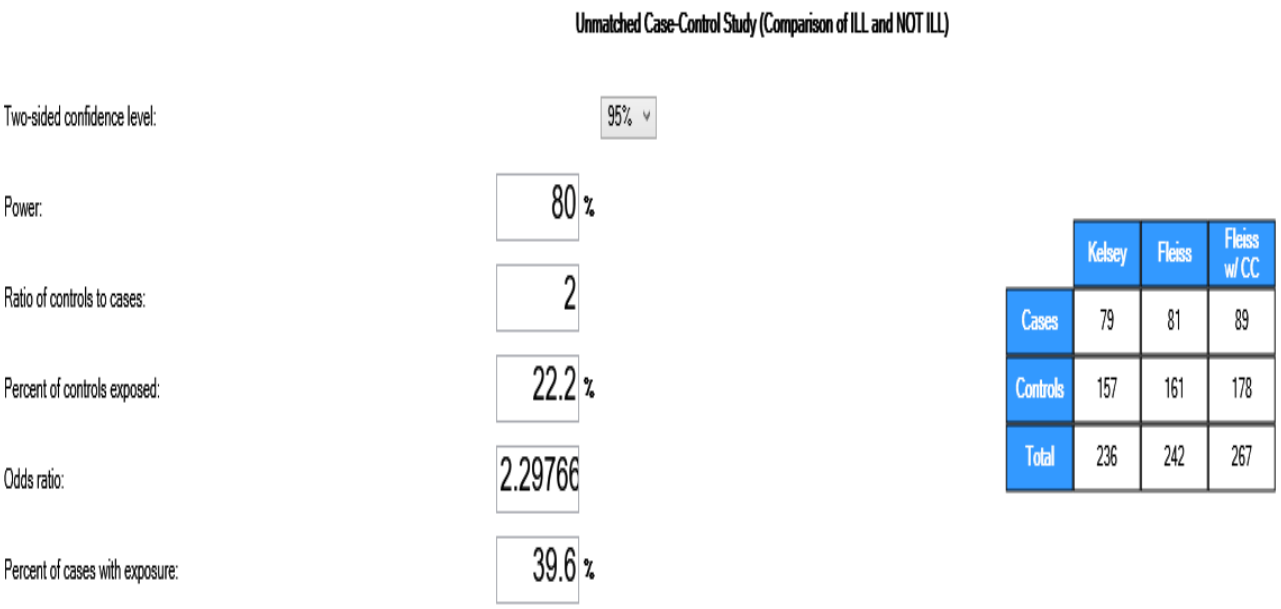

Figure 3. 1: Unmatched case control sample size design.

▶ Sampling technique:

The sample among the cases group was selected using the snow ball sampling technique, the sample among the controls was selected from the patients relatives after considering the matched age and gender.

▶ Eligibility criteria:

■ ***Inclusion criteria***

A) *For case group:*

- All adult patients with end stage renal failure who diagnosed within the last five years and has two persons of his/her family with the same age and gender consider as control.
- Patients who willing to participate in the present study.

B) *For control group:*

- Adult persons without renal failure.
- Who related to patient's family of first or second degree.
- The age and gender matching with the patient in case group.

■ **Exclusion criteria**

- Too tired patients.
- Patient has only one or no person consider as control.
- Patients their age less than 18 years old.
- Patients who refused to participate in this study.
- Patients who come to dialysis center after 22 o'clock.

▶ Data collection:

Stander questionnaire according to the study's aim was used, which includes the following parts:

Part one includes items regarding sociodemographic characteristics as (name, age, gender, residence, education level, household income, occupation, and phone number) and content family history.

Part two was about habits (Smoking, using Shamah, chewing Qat).

Part three includes past medical and surgical history (Hypertension, Diabetes mellitus, Cardiovascular disease, Renal stone, Urinary tract obstruction, Recurrent UTI, Liver cirrhosis, HIV, hereditary kidney disease, autoimmune disease, urogenital operations and Usage of sedative a lot).

▶ Data analysis:

The data were entered into the computer, reviewed and cleaned, and then analyzed by using (SPSS) software program.

▶ Ethical consideration:

- Research protocol was reviewed and approved by the ethical committee of college of Medicine Emirates International University.
- Before patient's interview, each patient informed about the aim of the study and the confidentiality of their data was ensured by the researcher.
- Also their rights to refuse or participate in the present study was confirmed and then oral informed consent obtained for interview.

Chapter 4: *Results*

Demographic characteristics of participants:

i. Distribution of the sample by age:

Table 4:1 showed the age of the participants in the two groups:
In the cases group, more than half of the cases 53.3% were above of 40 years, while the remaining 27.8% were in age group (30-40 years) and 18.9% of them are under 30 years.
In the control group, more than half of the participants were above the age of 40 years, while the remaining 22.8% were in age group (30-40 years) and 23.3% of them were under 30 years.
There was no big difference related to age between the two groups (the result of Chi-Square test showed that the P. value is 3.0).

Table 4. 1 Distribution of the sample by age.

			group of the patients	
			cases	control
Age group	20-29 yrs.	Frequency	17	42
		%	18.9%	23.3%
	30-39 yrs.	Frequency	25	41
		%	27.8%	22.8%
	40-49 yrs.	Frequency	19	43
		%	21.1%	23.9%
	50 yrs. And more	Frequency	29	54
		%	32.2%	30%
Total		Total	90	180

ii. Distribution of the sample by sex:

Figure 4:1 showed the distribution of the participants by sex in the two groups
In *the cases*, males were slightly more than females (57.8%, 42.2% respectively), also in the *control group* meals were slightly more than females (58.3%, 41.7% respectively).
There was no big difference related the gender between the two groups (the result of Chi-Square test showed that the P. value is 1.0)

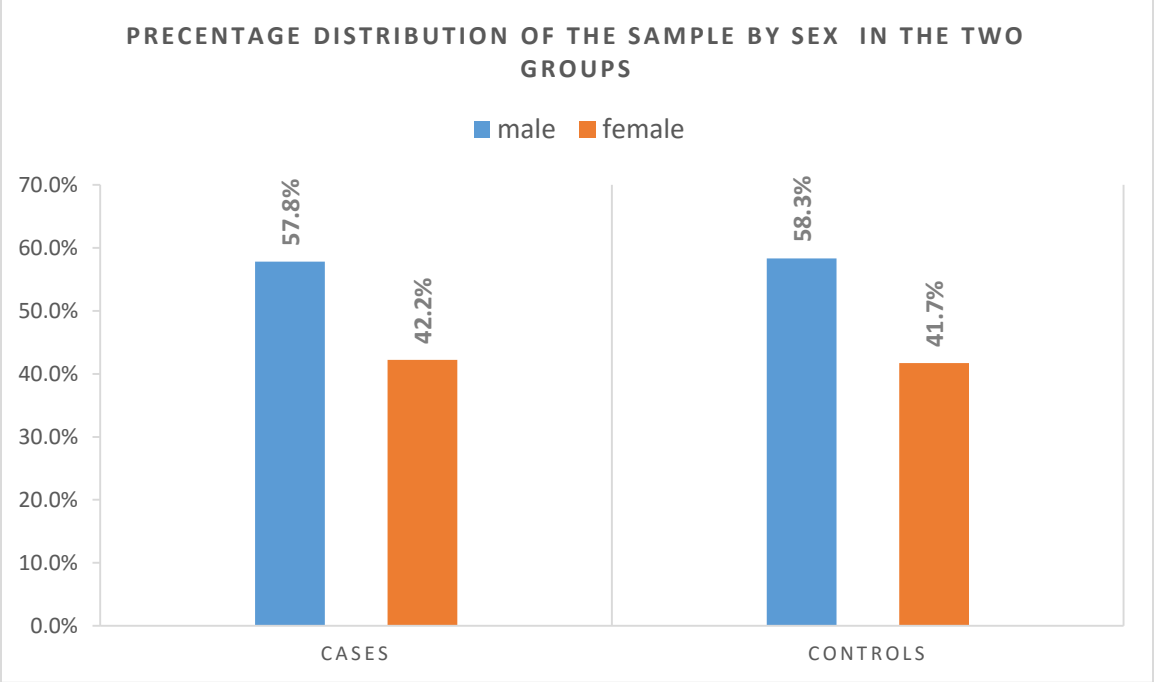

Figure 4. 1 Distribution of the sample by sex.

iii. Distribution of the sample by the resident of the patient:

Figure 4:2 showed the distribution of the participants by residence in the two groups:
Within *the cases*, urban were nearly equal to rural (50.6%, 49.4% respectively), also in *the control group*, urban are equal to rural (50%, 50% respectively).
There was no big difference related the residence between the two groups (the result of Chi-Square test showed that the P. value is 1.0).

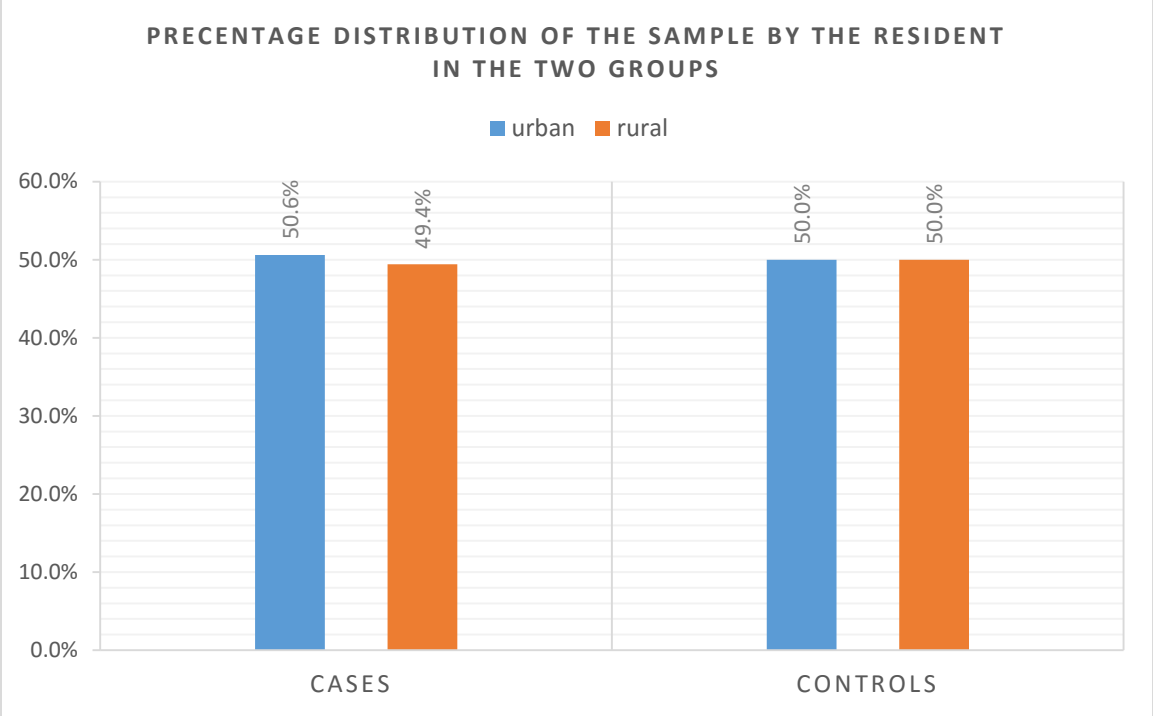

Figure 4. 2: Distribution of the participants by residence.

iv. Distribution of the sample by the education level of the patient:

Table 4:2 showed the distribution of the sample by the education level in the two groups:

In *the cases group*, more than half of participants were illiterate or low educated people (27.8%, 26.7% respectively), while those who are high-educated people were only 17.8% and the middle educated people were 27.8%.

In *the control group*, around half of participants were illiterate or low educated people (24.4%, 24.4% respectively), while those who are high-educated people were only 14.4% and the middle educated people were 36.7%.

There was no big difference related the education level between the two groups (the result of Chi-Square test showed that the P. value is 4.0).

Table 4. 2 Distribution of the sample by the education level.

			group of the patients	
			Cases	control
Education level	Illiterate	Frequency	25	44
		%	27.8%	24.4%
	primary school	Frequency	24	44
		%	26.7%	24.4%
	secondary	Frequency	20	55
		%	22.2%	30.6%
	Diploma	Frequency	5	11
		%	5.6%	6.1%
	university	Frequency	16	26
		%	17.8%	14.4%
Total		Total	90	180

v. Distribution of the sample by the marital status of the patient:

Depending to the marital status of the participants the result showed that, In *the cases group*, most of the participants were married (78.9%); while those who are single were 15.6% and the remaining were divorced 2.2% or widow 3.3% In *the control group*, almost of the participants were married (87.2%), while those who are single were 10.6% and the remaining were divorced 1.1% or widow 1.1% There was no big difference related the martial status between the two groups (the result of Chi-Square test showed that the P. value is 3.0).

Table 4. 3 Distribution of the sample by marital status.

			group of the patients	
			Cases	control
marital status	Single	Frequency	14	19
		%	15.6%	10.6%
	married	Frequency	71	157
		%	78.9%	87.2%
	divorce	Frequency	2	2
		%	2.2%	1.1%
	Widow	Frequency	3	2
		%	3.3%	1.1%
Total		Total	90	180

vi. Distribution of the sample by family income of the patient:

Depending to the family income in the two study groups:
In *the cases group*, almost of the participants 90% are from low income families (less than 100 thousands), while 8.9% from middle-income families and only 1.1% from high-income families.
In *the control group*, most of the participants 70% are from low income families (less than 100 thousands), while 27.2% from middle-income families and only 2.8% from high-income families.

There was no big difference related the family income between the two groups (the result of Chi-Square test showed that the P. value is 3.0).

Table 4. 4 Distribution of the sample by family income.

			group of the patients	
			Cases	control
family income	less than 100 thousand	Frequency	81	126
		%	90.0%	70.0%
	100-200 thousand	Frequency	7	33
		%	7.8%	18.3%
	200-300 thousand	Frequency	1	16
		%	1.1%	8.9%
	more than 300 thousands	Frequency	1	5
		%	1.1%	2.8%
Total	Total		90	180

vii. History of renal failure in the family:

Regarding to the History of renal failure in the family the result showed that, In *the cases group* 21.1% of them have family history of the renal failure, while in *the control group* only 16.1% of them have family history of the renal failure. There was small difference in family history of the renal failure between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is 0.3).

Table 4. 5 History of renal failure in the family.

			group of the patients		*P.* value
			Cases	control	
Family history of renal failure	Yes	Frequency	19	29	0.3
		%	21.1%	16.1%	
	No	Frequency	71	151	
		%	78.9%	83.9%	
Total		Total	90	180	

Social habits:

i. Smoking:

Regarding to smoking habit the result showed that, in *the cases group* 41.1% of them have history of smoking, while in *the control group* only 31.1% of them have history of smoking.
There was small difference in history of smoking between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is 0.3)

Table 4. 6 smoking habit.

			group of the patients		*P.* value
			Cases	control	
Smoking in Past	Yes	Frequency	37	56	0.3
		%	41.1%	31.1%	
	No	Frequency	53	124	
		%	58.9%	68.9%	
		Total	90	180	
Duration of smoking	less than 5 y	Frequency	11	14	
		%	29.7%	25.0%	
	5-10 y	Frequency	5	9	
		%	13.5%	16.1%	
	10-15y	Frequency	8	6	
		%	21.6%	10.7%	
	more than 15y	Frequency	13	27	
		%	35.1%	48.2%	
		Total	37	56	
Smoking currently	Yes	Frequency	7	47	
		%	18.9%	83.9%	
	No	Frequency	30	9	
		%	81.1%	16.1%	
	Total		37	56	

ii. Using Shamah:

Regarding to using shamah habit the result showed that, in *the cases group* only 8.9% of them have history of using shamah habit, while in *the control group* only 6.7% of them have history of using shamah habit.
There was no big difference in history of using shamah habit between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is 0.6).

Table 4. 7 using shamah habit.

			group of the patients		*P.* value
			Cases	Control	
Using Shamah in Past	Yes	Frequency	8	12	0.6
		%	8.9%	6.7%	
	No	Frequency	82	168	
		%	91.1%	93.3%	
		Total	90	180	
Duration of using shamah	less than 5 y	Frequency	3	0	
		%	37.5%	0.0%	
	5-10 y	Frequency	0	0	
		%	0	0	
	10-15y	Frequency	1	2	
		%	12.5%	16.7%	
	more than 15y	Frequency	4	10	
		%	50.0%	83.3%	
		Total	8	12	
Using shamah currently	Yes	Frequency	6	12	
		%	75.0%	100.0%	
	No	Frequency	2	0	
		%	25.0%	0.0%	
	Total		8	12	

iii. Chawing Qat:

Regarding to Chawing Qat habit the result showed that, in *the cases group* 60% of them have history of Chawing Qat, while in *the control group* only 67.2% of them have history of Chawing Qat.
There was small difference in history of Chawing Qat between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is 0.2).

Table 4. 8 Chawing Qat.

			group of the patients		*P.* value
			Cases	control	
Chawing Qat in Past	Yes	Frequency	54	121	0.2
		%	60.0%	67.2%	
	No	Frequency	36	59	
		%	40.0%	32.8%	
		Total	90	180	
Chawing Qat Duration	less than 5 y	Frequency	9	26	
		%	16.7%	21.5%	
	5-10 y	Frequency	7	13	
		%	13.0%	10.7%	
	10-15y	Frequency	6	16	
		%	11.1%	13.2%	
	more than 15y	Frequency	32	66	
		%	59.3%	54.5%	
		Total	54	121	
Chawing Qat currently	Yes	Frequency	6	116	
		%	11.1%	95.9%	
	No	Frequency	48	5	
		%	88.9%	4.1%	
	Total		54	121	

Past medical and surgical history:

i. Hypertension:

Regarding to the history of hypertension among participants the result showed that In the cases group, most of the participants 64.4% have history of hypertension, while in the control group only 13.3% of them have history of hypertension.

There was big difference in history of hypertension between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is less than 0.001).

Table 4. 9 History of Hypertension.

			group of the patients		*P.* value
			Cases	control	
Hypertension	Yes	Frequency	58	24	0.000
		%	64.4%	13.3%	
	No	Frequency	32	156	
		%	35.6%	86.7%	
		Total	90	180	
Hypertension Duration	less than 5 y	Frequency	26	11	0.3
		%	44.8%	45.8%	
	5-10 y	Frequency	13	6	
		%	22.4%	25.0%	
	10-15y	Frequency	6	5	
		%	10.3%	20.8%	
	more than 15y	Frequency	13	2	
		%	22.4%	8.3%	
		Total	58	24	
Using medication for Hypertension	Yes	Frequency	53	23	0.6
		%	91.4%	95.8%	
	No	Frequency	5	1	
		%	8.6%	4.2%	
	Total		58	24	

ii. **Diabetes:**

Regarding to the history of diabetes among participants the result showed that In *the cases group*, around quarter of the participants 22.2% have history of diabetes, while in *the control group* only 11.7% of them have history of diabetes. There was some difference in history of diabetes between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is 0.03).

Table 4. 10 History of Diabetes.

			group of the patients		*P.* value
			cases	control	
Diabetes	Yes	Frequency	20	21	0.03
		%	22.2%	11.7%	
	No	Frequency	70	159	
		%	77.8%	88.3%	
		Total	90	180	
Diabetes Duration	less than 5 y	Frequency	6	8	0.1
		%	30.0%	38.1%	
	5-10 y	Frequency	3	8	
		%	15.0%	38.1%	
	10-15y	Frequency	6	3	
		%	30.0%	14.3%	
	more than 15y	Frequency	5	2	
		%	25.0%	9.5%	
		Total	20	21	
Using medication for Diabetes	Yes	Frequency	19	20	1.0
		%	95.0%	95.2%	
	No	Frequency	1	1	
		%	5.0%	4.8%	
		Total	20	21	

iii. CVDs:

Regarding to the history of CVDs among participants the result showed that In *the cases group*, around fifth of the participants 18.9% have history of CVDs, while in *the control group* only 5.6% of them have history of CVDs.
There was some difference in history of CVDs between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is 0.001).

Table 4. 11 History of CVDs.

			group of the patients		*P.* value
			Cases	control	
CVDs	Yes	Frequency	17	10	0.001
		%	18.9%	5.6%	
	No	Frequency	73	170	
		%	81.1%	94.4%	
		Total	90	180	
CVDs Duration	less than 5 y	Frequency	9	5	0.3
		%	52.9%	50.0%	
	5-10 y	Frequency	6	2	
		%	35.3%	20.0%	
	10-15y	Frequency	1	3	
		%	5.9%	30.0%	
	more than 15y	Frequency	1	0	
		%	5.9%	0.0%	
		Total	17	10	
Using medication for **CVDs**	Yes	Frequency	16	9	1.0
		%	94.1%	90.0%	
	No	Frequency	1	1	
		%	5.9%	10.0%	
		Total	17	10	

iv. **Kidney stones:**

Regarding to the history of kidney stones among participants the result showed that In *the cases group*, around quarter of the participants 25.6% have history of Kidney stones, while in *the control group* only 11.7% of them have history of Kidney stones. There was some difference in history of Kidney stones between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is 0.005).

Table 4. 12 History of Kidney stones.

			group of the patients		*P.* value
			cases	control	
Kidney stones	Yes	Frequency	23	21	0.005
		%	25.6%	11.7%	
	No	Frequency	67	159	
		%	74.4%	88.3%	
		Total	90	180	
Kidney stones Duration	less than 5 y	Frequency	8	9	0.3
		%	34.8%	42.9%	
	5-10 y	Frequency	6	8	
		%	26.1%	38.1%	
	10-15y	Frequency	6	4	
		%	26.1%	19.0%	
	more than 15y	Frequency	3	0	
		%	13.0%	0.0%	
		Total	23	21	
Using treatment for Kidney stones	Yes	Frequency	20	18	1.0
		%	87.0%	85.7%	
	No	Frequency	3	3	
		%	13.0%	14.3%	
		Total	23	21	

v. Urinary tract infection:

Regarding to the history of Urinary tract infection among participants the result showed that in *the cases group*, more than third of the participants 37.8% have history of UTI, while in *the control group* only 7.8% of them have history of UTI. There was some difference in history of Urinary tract infection between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is less than 0.001).

Table 4. 13 History of Urinary Tract Infection.

			group of the patients		*P.* value
			Cases	control	
Urinary tract infection	Yes	Frequency	34	14	0.000
		%	37.8%	7.8%	
	No	Frequency	56	166	
		%	62.2%	92.2%	
		Total	90	180	
Urinary tract infection Duration	less than 5 y	Frequency	21	8	0.6
		%	61.8%	57.1%	
	5-10 y	Frequency	8	2	
		%	23.5%	14.3%	
	10-15y	Frequency	4	3	
		%	11.8%	21.4%	
	more than 15y	Frequency	1	1	
		%	2.9%	7.1%	
		Total	34	14	
Using medication for Urinary tract infection	Yes	Frequency	31	13	1.0
		%	91.2%	92.9%	
	No	Frequency	3	1	
		%	8.8%	7.1%	
	Total		34	14	

vi. Urinary tract obstructions:

Regarding to the history of Urinary tract obstructions among participants the result showed that in *the cases group*, those who had history of Urinary tract obstructions were 15.6%, while in *the control group* were only 1.7% of them had history of Urinary tract obstructions.

There was some difference in history of Urinary tract obstructions between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is less than 0.001).

Table 4. 14 History of Urinary Tract Obstructions.

			group of the patients		*P.* value
			cases	control	
Urinary tract obstructions	Yes	Frequency	14	3	0.000
		%	15.6%	1.7%	
	No	Frequency	76	177	
		%	84.4%	98.3%	
		Total	90	180	
Urinary tract obstructions Duration	less than 5 y	Frequency	11	3	0.6
		%	78.6%	100.0%	
	5-10 y	Frequency	2	0	
		%	14.3%	0.0%	
	10-15y	Frequency	0	0	
		%	0	0	
	more than 15y	Frequency	1	0	
		%	7.1%	0.0%	
		Total	14	3	
Using treatment for Urinary tract obstructions	Yes	Frequency	13	3	1.0
		%	92.9%	100.0%	
	No	Frequency	1	0	
		%	7.1%	0.0%	
	Total		14	3	

vii. Liver cirrhosis:

Regarding to the history of Liver cirrhosis among participants the result showed that in *the cases group*, those who had history of Liver cirrhosis were 1.1%, while in *the control group* were only 0.6 % of them had history of Liver cirrhosis.
There was no big difference in history of Liver cirrhosis between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is more than 0.05).

Table 4. 15 History of Liver Cirrhosis.

			group of the patients		*P.* value
			Cases	control	
Liver cirrhosis	Yes	Frequency	1	1	1.0
		%	1.1%	0.6%	
	No	Frequency	89	179	
		%	98.9%	99.4%	
		Total	90	180	

viii. HIV:

Regarding to the HIV cases among participants the result showed that, there was no any case in the two groups.

Table 4. 16 HIV cases.

			group of the patients		*P.* value
			Cases	control	
HIV	No	Frequency	90	180	
		%	100.0%	100.0%	
		Total	90	180	

ix. Hereditary diseases:

Regarding to the history of hereditary diseases among participants the result showed that in *the cases group*, those who had history of hereditary diseases (polycystic kidney disease) were 4.4%, while in *the control group* no one had history of hereditary diseases.

Table 4. 17 History of Hereditary Diseases among Participants.

			group of the patients	
			cases	control
Hereditary diseases	Yes	Frequency	4	0
		%	4.4%	0.0%
	No	Frequency	86	180
		%	95.6%	100.0%
		Total	90	180

x. Auto-immune diseases:

Regarding to the history of autoimmune diseases among participants the result showed that in *the cases group*, those who had history of autoimmune diseases (SLE) were 1.1%, while in *the control group* no one had history of autoimmune diseases. There was small difference in history of autoimmune diseases between the cases and controls and this difference was not statistically significance (the result of Chi-Square test showed that the P. value is 0.3).

Table 4. 18 History of Autoimmune Diseases among Participants.

			group of the patients		*P.* value
			cases	control	
Auto-immune diseases	Yes	Frequency	1	0	0.3
		%	1.1%	0.0%	
	No	Frequency	89	180	
		%	98.9%	100.0%	
		Total	90	180	

xi. Urinary tract operation:

Regarding to the history of Urinary tract operations among participants the result showed that in *the cases group*, those who had history of Urinary tract operations were 18.9%, while in *the control group*, were only 4.4 % of them had history of Urinary tract operations.
There was some difference in history of Urinary tract operations between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is less than 0.001).

Table 4. 19 History of Urinary Tract Operations among Participants.

			group of the patients		*P.* value
			Cases	control	
Urinary tract operations	Yes	Frequency	17	8	0.000
		%	18.9%	4.4%	
	No	Frequency	73	172	
		%	81.1%	95.6%	
		Total	90	180	

xii. Using sedatives:

Regarding to the history of using sedatives excessively among participants the result showed that in *the cases group*, those who had history of Using sedatives excessively were 32.2%, while in *the control group*, were only 11.7% of them had history of using sedatives excessively.
There was some difference in history of Using sedatives excessively between the cases and controls and this difference was statistically significance (the result of Chi-Square test showed that the P. value is less than 0.001).
Among those who history of using sedatives excessively in the two groups paracetamol was the first choice in the two groups (58.6%, 66.7% respectively).

Table 4. 20 History of using Sedatives Excessively.

			group of the patients		*P.* value
			cases	control	
Using sedatives	Yes	Frequency	29	21	0.000
		%	32.2%	11.7%	
	No	Frequency	61	159	
		%	67.8%	88.3%	
		Total	90	180	
Using sedatives Duration	less than 1 year	Frequency	5	4	0.5
		%	17.2%	19.0%	
	1-2 y	Frequency	2	2	
		%	6.9%	9.5%	
	2-3 y	Frequency	3	0	
		%	10.3%	0.0%	
	more than 3 y	Frequency	19	15	
		%	65.5%	71.4%	
		Total	29	21	
Types of sedatives	Paramol	Frequency	17	14	
		%	58.6%	66.7%	
	Profine	Frequency	2	4	
		%	6.9%	19.0%	
	Diclofenac	Frequency	10	3	
		%	34.5%	14.3%	
	Total		29	21	

Chapter 5: *Discussion*

This chapter discuss in detail the major finding and the implication of them, The result put in context of the previous and recent research in form of comparing our finding with other researches finding (where applicable) and comparing our finding based on the background variables. The main topics are: Characteristics of sample under study, History of renal failure in the family, history of some habits (smoking, using shamah and chawing Qat), Past medical and surgical history(Hypertension, Diabetes mellitus, Cardiovascular disease, Renal stone, Urinary tract obstruction, Recurrent UTI, Liver cirrhosis, HIV, Hereditary kidney disease, Autoimmune disease, Urogenital Operations and Usage of Sedative a lot).

Characteristics of sample under study:

- The current study showed that more than half of the patients were above of 40 years in the two groups and those who are under 30 years in the cases and controls were only (18.9% and 23.3% respectively). Also there was no difference related to age between the two groups (P. value is 3.0). This result was in agreement with other studies were conducted in Erbil city-Iraq, in Pakistan and in Sa'adah-Yemen. In other side, the current study is not in agreement with other study was conducted in Abidjan whom showed more or less age than the current result (study).

- The current study showed that males were slightly more than females in two groups and there was no difference related to gender between the two groups (P. value is 1.0). This result was in agreement with other studies were conducted in Abidjan, in Pakistan and in Sa'adah-Yemen. In other side, the current study is not in agreement with other study was conducted in Erbil city-Iraq whom showed that female more than male.

- The current study showed that urban residents were nearly equal to rural residents in two groups and there was no difference related to residence between the two groups (P. value is 1.0). This result was in agreement with other study was conducted in Pakistan. In other side, the current study is not in agreement with other study was conducted in Erbil city-Iraq whom showed that tow third of cases were from urban and P.value is 0.002.

- The current study showed that more than half of participants were illiterate or low educated people in the cases while in controls around half of participants were illiterate or low educated people and those who are high educated people in the cases and controls were only (17.8% and 14.4% respectively). There was no difference related to education level between the two groups (P. value is 4.0). This result was in agreement with other studies were conducted in Erbil city-Iraq and in Sa'adah-Yemen).
- This study showed that almost of the participants in the two groups are from low income families (90% and 70% respectively). And there was no difference related to family income between the two groups (P. value is 3.0) This result was in agreement with other study was conducted in Gaza Strip-Palestinian. In other side, the current study is not in agreement with other study was conducted in Erbil city-Iraq showed that 41.6 % of case group are at insufficient status.

History of renal failure in the family:

Regarding to the History of renal failure in the family the present study showed that, within the cases 21.1% of them have family history of the renal failure, while in the control group only 16.1% of them have family history of the renal failure. The difference in family history of the renal failure between the cases and controls was not statistically significance (P. value is 0.3). This result is not in agreement with other study was conducted in Pakistan, showed that statistically significance and P.value was 0.002.

History of some habits:

In the current study, the history of three habits (chawing Qat, smoking and using shamah) was studied among the two study groups.

- The result of the present study showed that, **chawing Qat** was the most popular habit among the two groups, where more than half of participants in the two groups had history of chawing Qat, but there was no important difference in the history of chawing Qat between the two groups as (P. value was 0.2).

- Regarding to the history of **smoking** among the two groups the current study showed that more than third of cases (41.1%) and only (31.1%) of controls had history of smoking, but there was no important difference in the history of smoking between the two groups as (P. value was 0.3). This result was in agreement with other researchers were conducted in Pakistan and in Kaiser Permanente Northwest.

In other side, the current study is not in agreement with other researchers were conducted in Erbil city-Iraq, and in Sa'adah-Yemen whom showed that statistically significance.

- Also this study showed that, using **shamah** was very rare among the participants of the two groups. The difference in using **shamah** between the cases and controls was not statistically significance (P. value = 0.6). This result is not in agreement with other study was conducted in Sa'adah-Yemen, whom showed that statistically significance and P. value < 0.001

Past medical and surgical history:

Regarding to the history of Past medical and surgical diseases among the two groups the result of the current study showed that:

- History of **hypertension** was much higher among cases than controls (64.4% and 13.3% respectively) and the difference was highly significant (P. value is less than 0.001). This result was in agreement with other researchers were conducted in Pakistan, in Gaza Strip-Palestinian, in Erbil city-Iraq, in Sa'adah-Yemen in Abidjan and in Kaiser Permanente Northwest.

- Regarding to the history of **diabetes** among the participants in the two groups this study showed history of **diabetes** was higher among cases than controls and the difference was significant (P. value = 0.03). This result was in agreement with other researchers were conducted in Pakistan, in Gaza Strip-Palestinian, in Erbil city-Iraq, in Sa'adah-Yemen and in Kaiser Permanente Northwest. In other side, the current study is not in agreement with other study was conducted in Abidjan whom showed that not statistically significance in history of **diabetes**.

- Regarding to history of **CVDs** was much higher among cases than controls (18.9% and 5.6% respectively) and the difference was highly significant (P. value = 0.001). This result was in agreement with other study was conducted in Sa'adah-Yemen. In other side, the current study is not in agreement with other study was conducted in Pakistan whom showed that P.value was 0.4.

- Regarding to the urinary tract system diseases, the result of this study showed, history of **urinary tract infection** and **urinary tract obstructions** were much higher among cases than controls; and the difference between the two groups was highly significant (P. value is less than 0.001). Also history of **kidney stones** was higher among cases than controls and the difference was significant (P. value is 0.005). This result was in agreement with other researchers were conducted in Gaza Strip-Palestinian and in Sa'adah,-Yemen. In other side, the current study is not in agreement with other researchers were conducted in Erbil city-Iraq, and in Kaiser Permanente Northwest, whom showed that not statistically significance in history of **kidney stones**.

- The result of the current study showed that, history of **liver cirrhosis** was very rare among the two groups (1.1% and 0.6 respectively) and there was no important difference in history of **Liver cirrhosis** between the cases and controls as the difference was not statistically significance (P. value is more than 0.05). This result was not in agreement with other researcher was conducted in Pakistan whom showed that 13.3% of case group have history of liver cirrhosis.

- There was important difference in history of **Hereditary kidney diseases** (polycystic kidney disease) between the cases and controls and this difference was statistically significance (P. value is 0.01); this result was in agreement with other study was conducted in Erbil city-Iraq.

- While no difference recoded in the history of **Auto-immune diseases and HIV** between the two groups.

- Regarding to the history of **Urinary tract operations** among participants in the two groups the result showed that, those who had history of **Urinary tract operations** were much higher in the cases group than those in the control group were (18.9% and 4.4% respectively). There was important difference in the history of **Urinary tract operations** between the two groups and this difference was highly significant (P. value is less than 0.001).

- Regarding to the history of **using sedatives excessively** among participants in the two groups the result showed that, those who had history of **Using sedatives excessively** were 32.2%, while in the control group were only 11.7%. There was some difference in history of history of **Using sedatives excessively** between the cases and controls and this difference was highly significance (P. value is less than 0.001). Among those who history of using sedatives excessively in the two groups paracetamol was the first choice in the two groups (58.6%, 66.7% respectively).

This result was in agreement with other researchers were conducted in Pakistan and in Gaza Strip-Palestinian.

Chapter 6: *Conclusion* & *Recommendation*

Conclusion:

The following are the main conclusions for this study:

- There is no relation between ESRF and the **History of renal failure** in the family.
- There is no relation between ESRF and the history of some habits such as (**smoking, chawing Qat and using shamah**).
- There is a strong relationship between ESRF and some chronic diseases such as (**hypertension, CVDs and diabetes**).
- There is no relationship between ESRF and some other related diseases such (**Liver cirrhosis, HIV and Autoimmune diseases)**.
- Regarding to the urinary tract diseases, there is strong relationship between the history of **(kidney stones, urinary tract infections, urinary tract obstructions and hereditary kidney diseases)** and developing ESRF.
- In addition, there is a strong relationship between the history of **Urinary tract operations** and developing ESRF.
- There is a strong relation between the history of **using sedatives excessively** in the past and developing CRF.

Recommendation:

Through our study and its results, we recommend the following:

- The Study recommend spreading the culture of routine examination and its importance in society and especially for persons with risk factors.
- The Study recommend the person who has kidney disease, blood pressure or diabetes to follow up with a specialist doctor for the optimal treatment.
- The Study recommend the people who suffer from kidney stones to use the quick treatment to remove these stones and preserve the kidneys, and not to use folk mixtures that may lead to significant damage to the kidneys.
- The people who are suffering from hereditary kidney diseases need to follow up with a specialist doctor and perform periodic examinations to maintain their kidneys.
- The Study recommend limiting the excessive use of analgesic drugs, because it has great damage to the kidneys.
- The Study recommend the Ministry of Health and Population to adopt continuous educational to define this disease (RF) and its risk factors.
- The Study recommend providing the necessary services and expanding the dialysis centers so that patients can be better accommodated and served.

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Patient questionnaire

The first point: the personal data of the patient

1	The name	.....							
2	the age	1-[ ] (20 to 29 years old)	2- [ ] (30 to 39 years old)	3- [ ] (40 to 49 years old)	4- [ ] (50 years old and more)				
3	sex	1-[ ] male		2- [ ] female					
4	residence	1-[ ] City (Indicate the name of the governorate: .....)		2- [ ] Rural (Indicate the name of the village: .....)					
5	Educational level	1-[ ] not educated	2- [ ] basic	3- [ ]secondary	4- [ ] diploma or institute	5- [ ] Collectors			
6	Social status	1-[ ] single	2- [ ] married	3- [ ]absolute	4- [ ] widowed				
7	Household income level per month	1-[ ] Less than 100,000 Yemeni riyals.							
		2- [ ] Between 100 to 200 thousand Yemeni riyals.							
		3- [ ] Between 200 to 300 thousand Yemeni riyals.							
		4- [ ] More than 300,000 Yemeni riyals.							
8	Occupation	.....							
9	phone number	.....							
10	When did you start dialysis?	1-[ ] Less than 5 years old	2- [ ] From 5 to 10 years	3- [ ]more than 10 years					
11	Are there people in the family with the same disease:	1-[ ] Yes, the relationship between you:							2- [ ] No
		1-[ ] One of the parents	2- [ ] Brothers or Sisters	3- [ ]Your children	4- [ ] Other (.....)				
12									

The second point: special habits that are considered as a risk factor for kidney failure

13	**Smoking:** Have you ever smoked before suffering from kidney failure?	1- [ ] Yes, How long was the dealing?				2-[ ]No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		smoking type:				
		[ ] cigarette	[ ] Shisha	[ ] madaeuh		
		Amount of smoke per day:				
		[ ] Less than half a packet	[ ] Half Bucket	[ ] one packet	[ ] more than packet	
		Do you still smoke:				
		[ ] Yes	[ ] No			

14	**Sniff (shamah):** Have you been using the sniffer before you had kidney failure?	1-[ ] Yes, How long was the dealing? [ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years Amount of sniffing (shamah) per day: [ ] Less than half a bag / [ ] half a bag / [ ] one bag / [ ] more than a bag Are you still sniffing (shamah)? [ ] Yes / [ ] No	2- [ ]No
15	**Chewing Qat:** Have you been chewing Qat before suffering from kidney failure?	1-[ ] Yes, the duration of the practice of chewing Qat: [ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years Duration of chewing Qat per day: [ ] Less than 3 hours / [ ] From 3 to 6 hours / [ ] From 6 to 9 hours / [ ]More than 9 hours Do you still chew Qat? [ ] Yes / [ ] No	2-[ ]No
16	**drinking alcohol:** Have you been drinking alcohol while living with kidney failure disease?	1-[ ] Yes, How long was the dealing? [ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years Amount of alcohol consumption per day: [ ] less than 500 ml / [ ] from 500 to 750 ml / [ ] more than 750 ml Do you still drink alcohol? [ ] Yes / [ ] No	2-[ ]No

The third point: risk factors for kidney failure

17	**Obesity (patient weight):** Have you been obese Before you had kidney failure?	1-[ ] Yes	2- [ ] No
18	**High blood pressure disease:** Have you had High blood pressure before you had kidney failure?	1-[ ] Yes, the duration of HTN: [ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years Have you used a treatment for HTN: [ ] Yes / [ ] No Regular use of treatment with the follow-up of his doctor: [ ]regular / [ ] irregular	2- [ ] No
19	**Diabetes:** Have you had Diabetes before you had kidney failure?	1-[ ] Yes, the duration of diabetes: [ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years Have you used a treatment for diabetes: [ ] Yes / [ ] No Regular use of treatment with the follow-up of his doctor: [ ]regular / [ ] irregular	2- [ ] No

20	**CVDs:** Have you had CVDs before you had kidney failure?	1-[ ] Yes, the duration of CVDs:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for CVDs:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
21	**Kidney Stones:** Have you had Kidney Stones before you had kidney failure?	1-[ ] Yes, the duration of kidney stones:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for kidney stones:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
22	**Recurrent kidney and urinary tract infections:** Have you had frequent kidney and urinary tract infections before you had kidney failure?	1-[ ] Yes, the duration of infection in the kidneys and urinary tract:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for kidney and urinary tract infections:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
23	**Urinary obstruction:** Have you had a blockage in the urinary tract before you had kidney failure (enlarged prostate, tumors in the kidneys and urinary tract, stones)?	1-[ ] Yes, the duration of obstruction in the urinary tract:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for urinary tract obstruction:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
24	**Liver cirrhosis:** Have you had cirrhosis of the liver before you had kidney failure?	1-[ ] Yes, the duration of cirrhosis of the liver:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for cirrhosis of the liver:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
25	**Immunodeficiency disease (AIDS):** Have you had immunodeficiency disease before you had kidney failure?	1-[ ] Yes, duration of immunodeficiency disease:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for immunodeficiency:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		

26	Do you suffer from hereditary kidney disease?	1-[ ] Yes				2- [ ] No
27	Do you suffer from autoimmune disease?	1-[ ] Yes				2- [ ] No
28	**Previous operations:** Have you had any previous urogenital surgeries?	1-[ ] Yes				2- [ ] No
29	**Use of medications and sedatives:** Have you been using medications and sedatives excessively before you had kidney failure?	1-[ ] Yes, how long was the use of sedatives:				2- [ ] No
		[ ] less than one year	[ ] From one to two years	[ ] From 2 to 3 years	[ ] more than 3 years	
		Usage amount:				
		[ ] Daily	[ ] 3 times a week	[ ] twice a week	[ ] Once a week	
		Sedative type:				
		[ ] Paracetamol		[ ] NSAID		
		How to use:				
		[ ]Oral pills	[ ]effervescent tablets	[ ] intravenous injection	[ ] intramuscular injection	

Questionnaire for the control

The first point: the personal data of the control

1	The name	.....			
2	the age	1-[ ] (20 to 29 years old)	2- [ ] (30 to 39 years old)	3- [ ] (40 to 49 years old)	4- [ ] (50 years old and more)
3	Sex	1-[ ] male		2- [ ] female	
4	Residence	1-[ ] City (Indicate the name of the governorate: .....)		2- [ ] Rural (Indicate the name of the village: .....)	
5	Educational level	1-[ ] not educated	2- [ ] basic	3- [ ]secondary	4- [ ] diploma or institute	5- [ ] Collectors
6	Social status	1-[ ] single	2- [ ] married	3- [ ]absolute	4- [ ] widowed
7	Household income level per month	1-[ ] Less than 100,000 Yemeni riyals.			
		2- [ ] Between 100 to 200 thousand Yemeni riyals.			
		3- [ ] Between 200 to 300 thousand Yemeni riyals.			
		4- [ ] More than 300,000 Yemeni riyals.			
8	Occupation	.....			
9	phone number	.....			
10					
11	Are there people in the family with the same disease:	1-[ ] Yes, the relationship between you:				2-[ ]No
		1-[ ] One of the parents	2- [ ] Brothers or Sisters	3- [ ]Your children	4- [ ] Other (.....)	
12	The full name of your relative who has kidney failure	.....			

The second point: daily habits that are considered as a risk factor for kidney failure:

13	**smoking:** Have you smoked for the past ten years?	1- [ ] Yes, How long was the dealing?				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		smoking type:				
		[ ] cigarette	[ ] Shisha	[ ] madaeuh		
		Amount of smoke per day:				
		[ ] Less than half a packet	[ ] Half Bucket	[ ] one packet	[ ] more than packet	
		Do you still smoke:				
		[ ] Yes	[ ] No			

14	**Sniff (shamah):** Have you been sniffing for the past ten years?	1- [ ] Yes, How long was the dealing?	2- [ ] No
		[ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years	
		Amount of sniffing (shamah) per day:	
		[ ] Less than half a bag / [ ]half a bag / [ ] one bag / [ ]more than a bag	
		Are you still sniffing (shamah)?	
		[ ] Yes / [ ] No	
15	**Chewing Qat:** Have you been chewing Qat for the past ten years?	1-[ ] Yes, the duration of the practice of chewing Qat:	2- [ ] No
		[ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years	
		Duration of chewing Qat per day:	
		[ ] Less than 3 hours / [ ] From 3 to 6 hours / [ ] From 6 to 9 hours / [ ]More than 9 hours	
		Do you still chew Qat?	
		[ ] Yes / [ ] No	
16	**drinking alcohol:** Have you been drinking alcohol for the past ten years?	1- [ ] Yes, How long was the dealing?	2- [ ] No
		[ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years	
		Amount of alcohol consumption per day:	
		[ ] less than 500 ml / [ ] from 500 to 750 ml / [ ] more than 750 ml	
		Do you still drink alcohol?	
		[ ] Yes / [ ] No	

The third point: risk factors for kidney failure:

17	**Obesity (patient weight):** Have you been obese for the past ten years?	1-[ ] Yes	2- [ ] No
18	**High blood pressure disease:** Have you had high blood pressure during the past ten years?	1-[ ] Yes, the duration of HTN:	2- [ ] No
		[ ] Less than 5 years old / [ ] From 5 to 10 years / [ ] From 10 to 15 years old / [ ] more than 15 years	
		Have you used a treatment for HTN:	
		[ ] Yes / [ ] No	
		Regular use of treatment with the follow-up of his doctor:	
		[ ]regular / [ ] irregular	

19	**diabetes:** Have you had diabetes for the past ten years?	1-[ ] Yes, the duration of diabetes:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for diabetes:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
20	**CVDs:** Have you suffered from cardiovascular problems during the past ten years?	1-[ ] Yes, the duration of CVDs:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for CVDs:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
21	**Kidney stones:** Have you had kidney stones in the past ten years?	1-[ ] Yes, the duration of kidney stones:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for kidney stones:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
22	**Recurrent kidney and urinary tract infections:** Do you suffer from frequent kidney and urinary tract infections during the past ten years?	1-[ ] Yes, the duration of infection in the kidneys and urinary tract:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for kidney and urinary tract infections:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
23	**Urinary tract obstruction:** Do you suffer from obstruction in the urinary tract during the past ten years (enlarged prostate, tumors in the kidneys and urinary tracts, stones)	1-[ ] Yes, the duration of obstruction in the urinary tract:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for urinary tract obstruction:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		
24	**Liver cirrhosis:** Have you suffered from cirrhosis of the liver during the past ten years?	1-[ ] Yes, the duration of cirrhosis of the liver:				2- [ ] No
		[ ] Less than 5 years old	[ ] From 5 to 10 years	[ ] From 10 to 15 years old	[ ] more than 15 years	
		Have you used a treatment for cirrhosis of the liver:				
		[ ] Yes		[ ] No		
		Regular use of treatment with the follow-up of his doctor:				
		[ ]regular		[ ] irregular		

<table>
<tr><td>25</td><td>Immunodeficiency disease (AIDS):
Have you had an immunodeficiency disease for the past ten years?</td><td colspan="4">1-[ ] Yes, duration of immunodeficiency disease:</td><td rowspan="6">2- [ ] No</td></tr>
<tr><td>[ ] Less than 5 years old</td><td>[ ] From 5 to 10 years</td><td>[ ] From 10 to 15 years old</td><td>[ ] more than 15 years</td></tr>
<tr><td colspan="4">Have you used a treatment for immunodeficiency:</td></tr>
<tr><td colspan="2">[ ] Yes</td><td colspan="2">[ ] No</td></tr>
<tr><td colspan="4">Regular use of treatment with the follow-up of his doctor:</td></tr>
<tr><td colspan="2">[ ]regular</td><td colspan="2">[ ] irregular</td></tr>
<tr><td>26</td><td>Do you suffer from hereditary kidney disease?</td><td colspan="4">1-[ ] Yes</td><td>2- [ ] No</td></tr>
<tr><td>27</td><td>Do you suffer from autoimmune disease?</td><td colspan="4">1-[ ] Yes</td><td>2- [ ] No</td></tr>
<tr><td>28</td><td>Previous operations:
Have you had any previous urogenital surgeries?</td><td colspan="4">1-[ ] Yes</td><td>2- [ ] No</td></tr>
<tr><td>29</td><td>Use of medications and sedatives:
Have you used medications and sedatives excessively during the past ten years?</td><td colspan="4">1-[ ] Yes, how long was the use of sedatives:</td><td rowspan="8">2- [ ] No</td></tr>
<tr><td>[ ] less than one year</td><td>[ ] From one to two years</td><td>[ ] From 2 to 3 years</td><td>[ ] more than 3 years</td></tr>
<tr><td colspan="4">Usage amount:</td></tr>
<tr><td>[ ] Daily</td><td>[ ] 3 times a week</td><td>[ ] twice a week</td><td>[ ] Once a week</td></tr>
<tr><td colspan="4">Sedative type:</td></tr>
<tr><td colspan="2">[ ] Paracetamol</td><td colspan="2">[ ] NSAID</td></tr>
<tr><td colspan="4">How to use:</td></tr>
<tr><td>[ ]Oral pills</td><td>[ ]effervescent tablets</td><td>[ ] intravenous injection</td><td>[ ] intramuscular injection</td></tr>
</table>

واستخدام المهدئات كانت (32.2٪، 11.7 وقيمة p أقل من 0.001). بينما لم يكن هناك فرق مهم بين المجموعتين لأمراض أخرى مثل تليف الكبد وفيروس نقص المناعة وأمراض المناعة الذاتية.

الاستنتاج

أكدت دراستنا أن هناك علاقة قوية بين تاريخ بعض الأمراض المزمنة مثل ارتفاع ضغط الدم، مرض السكري، الأمراض القلبية الوعائية والتهابات المسالك البولية وتطور الفشل الكلوي بمراحله الأخيرة، كما أن هناك علاقة قوية بين الاستخدام المفرط للأدوية المسكنة وتطور الفشل الكلوي بمراحله الأخيرة.

التوصيات

- الدراسة توصي بنشر ثقافة الفحص الروتيني واهميته بين فئات المجتمع بشكل عام وخاصة لأمراض ارتفاع ضغط الدم والسكري وأمراض الكلى.
- الدراسة توصي الأشخاص المصابين بأمراض الكلى وارتفاع ضغط الدم والسكري بمتابعة الطبيب المختص والالتزام بتلقي العلاج المناسب.
- الدراسة توصي الأشخاص الذين يعانون من حصوات الكلى باستخدام العلاج السريع لإزالة هذه الحصوات والحفاظ على الكلى وعدم استخدام الخلطات الشعبية التي قد تؤدي إلى أضرار كبيرة في الكلى.
- الدراسة توصي الذين يعانون من أمراض الكلى الوراثية إلى المتابعة مع طبيب متخصص وإجراء فحوصات دورية للحفاظ على الكلى لديهم.
- الدراسة توصي بالحد من استخدام الأدوية المسكنة بشكل مفرط، لما لها من أضرار كبيرة على الكلى.

ملخص البحث باللغة العربية:

المقدمة

الفشل الكلوي هو حالة طبية تعمل فيها الكلى بأقل من 15٪ من المستويات الطبيعية، بينما المرحلة الأخيرة من الفشل الكلوي هي مرحلة فشل لا رجوع فيها في وظائف الكلى، مما يؤدي إلى انخفاض دائم في معدل الترشيح الكبيبي. يختلف انتشار المرحلة الأخيرة من الفشل الكلوي اختلافًا كبيرًا في جميع أنحاء العالم؛ حيث أن بعض من سكان العالم يتأثرون بمرض الكلى المزمن، وهؤلاء الأشخاص هم الأكثر عرضة للإصابة بمرض المرحلة الأخيرة من الفشل الكلوي. ونظراً لوجود قصور في الدراسات حول أسباب وعوامل الخطورة التي تؤدي إلى المرحلة الأخيرة من الفشل الكلوي في اليمن، لذلك تم تصميم هذه الدراسة لدراسة عوامل الخطورة التي تؤدي إلى المرحلة الأخيرة من الفشل الكلوي.

الأهداف

الهدف العام من هذه الدراسة هو تحديد عوامل الخطورة التي تؤدي الى المرحلة الأخيرة من الفشل الكلوي.

منهجية الدراسة

تم إجراء دراسة الحالات والشواهد (90 حالة و180 مجموعة الشواهد) في مركز غسيل الكلى في مستشفى الثورة -صنعاء اليمن –خلال شهر فبراير بسنة 2022م. كانت مجموعة الحالات هم مرضى تم تشخيصهم بمرض المرحلة الأخيرة من الفشل الكلوي خلال الخمس السنوات الماضية، بينما كانت مجموعة الشواهد من أقارب المرضى، الذين هم أشخاص أصحاء لا يعانون من الفشل الكلوي ولكنهم يرتبطون بأسرة المريض من الدرجة الأولى أو الثانية من نفس العمر والجنس.
تم استخدام استبيان لجمع البيانات التي تشمل البيانات الاجتماعية والديموغرافية والبيانات حول عوامل الخطر. وتم تحليل البيانات باستخدام الإصدار 21 من SPSS.

النتائج

كانت مجموعة الحالات 90 حالة ومجموعة الشواهد 180 شخص. كانت غالبية المجموعتين في منتصف العمر ومتزوجين. كانت نسبة الذكور أعلى قليلاً من نسبة الإناث في المجموعتين. أما ما يتعلق بالوضع الاقتصادي كان أكثر من ثلاثة أرباع مجموعة الحالات غير مستكفي، وأكثر مجموعة الحالات متعلمة. أما بالنسبة لتاريخ الفشل الكلوي في الأسرة فقد أظهرت النتيجة أنه في مجموعة الحالات 21.1٪ بينما في مجموعة الشواهد 16.1٪ فقط. إضافة إلى ذلك وجدنا أنه لم يكن هناك فرق مهم في العادات الاجتماعية كالتدخين واستخدام الشمة ومضغ القات بين المجموعتين، حيث لم يكن الاختلاف ذو دلالة إحصائية. أما بخصوص تاريخ الأمراض المزمنة فقد أظهرت النتائج وجود فرق مهم بين المجموعتين وكان هذا الاختلاف ذا دلالة إحصائية لبعض الأمراض مثل ارتفاع ضغط الدم (64.4٪، 13.3٪ على التوالي، وقيمة p أقل من 0.001)، ومرض السكري (22.2٪، 11.7٪ على التوالي، قيمةp= 0.03) ، وأمراض القلب والأوعية الدموية (18.9٪، 5.6 و قيمة 0.03) p= أما بخصوص تاريخ أمراض الكلى فقد أوضحت النتائج وجود فرق مهم بين المجموعتين وكان هذا الاختلاف ذا دلالة إحصائية لبعض الأمراض مثل حصى الكلى في مجموعة الحالات والشواهد (25.6٪ ، 11.7٪ على التوالي ، وقيمةp = 0.005) ، التهاب المسالك البولية (37.8٪ ، 7.8 وقيمة p أقل من 0.001)، انسداد المسالك البولية (15.6٪ ، 1.7٪ وقيمة pأقل من 0.001)، أمراض الكلى الوراثية (4.4٪ ، 0.0٪ وقيمة p = 0.01) وعمليات المسالك البولية (18.9٪ ، 4.4٪ وقيمة p أقل من 0.001).