



Article

Prevalence and Etiology of Chronic Renal Failure in Al-Diwaniyah Hemodialysis Unit

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Abstract: Chronic kidney disease (CKD) is characterized by damage to the kidneys or a decrease in the estimated glomerular filtration rate (egfr) to below 60 ml/min per 1.73 square meters, lasting for at least 3 months. This condition leads to a gradual decline in kidney function, which may eventually require treatment options like dialysis or transplantation. And rising incidence and Prevalence in the world. To determine the primary reasons for kidney failure among patients in the hemodialysis unit of AL Diwaniyah and how to minimize these reasons and the Environmental changes associated with kidney failure, in an attempt to mitigate the negative effects of these variables on patients. A descriptive study with a quantitative approach was carried out involving both males and females in the AL Diwaniyah hemodialysis unit for patients with chronic renal failure Our study included 50 patients who attended to al Diwaniyah hemodialysis unit in al Diwaniyah Teaching hospital and from history and investigations. The study found that chronic renal failure was more common in male (60%) than female (40%) and the most common cause is High blood pressure accounts for 36% of cases, with diabetes following at 26%. Other causes include chronic pyelonephritis at 8%, urinary tract stones at 6%, polycystic kidney disease at 4%, and chronic glomerulonephritis and cortical necrosis, both at 2%. Additionally, 16% of cases are idiopathic, potentially linked to medications, toxins, and congenital issues. Many leading causes of chronic kidney disease are treatable, and starting the right treatment early can help stop CKD from developing further or advancing to end-stage renal failure.

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1. Introduction

The kidneys, shaped like beans, are located just below the ribs on either side of your spine, hidden behind your abdomen. Each kidney measures approximately 4 to 5 inches in length, comparable to a large fist. Their primary purpose is to clean your blood[1]. They eliminate waste, regulate fluid balance, and maintain proper electrolyte levels. Throughout the day, all the blood in your body passes through these organs multiple times. Inside each kidney, there are about a million tiny filters known as nephrons. Even if only 10% of your kidneys are functioning, you might not experience any noticeable symptoms or issues[2]. However, if blood flow to a kidney halts, part of it or the whole organ could die[3]. This can cause chronic renal failure, a condition where the kidneys lose their ability to filter out waste and fluids from the blood, leading to a gradual and irreversible decline in their function over months or years. This decline is marked by a persistent reduction in kidney efficiency, known as glomerular filtration rate (GFR), leading to the buildup of urea and other substances in the bloodstream. A clear definition of this condition isn't widely agreed

upon[4]. Mostly, chronic renal failure affects people with existing medical problems that damage the nephron units responsible for filtering. Common conditions that lead to this failure include diabetes (both type 1 and type 2) and high blood pressure[5]. Prolonged high blood sugar can injure the kidneys, while hypertension causes damage to blood vessels, including those supplying the kidneys. Other kidney-affecting conditions include glomerulonephritis, which refers to a group of diseases that result in inflammation and harm to the kidney's filtering structures[6].

These conditions rank as the third most prevalent form of kidney disease. They include inherited issues like polycystic kidney disease, which results in the formation of large cysts that harm surrounding tissues. Additionally, malformations during fetal development can lead to narrow passages that obstruct normal urine flow, causing urine to back up into the kidneys, which can trigger infections and further kidney damage. Autoimmune disorders, such as lupus and IgA nephropathy, also impact the immune system and may contribute to kidney issues. Blockages can arise from kidney stones, tumors, or an enlarged prostate in men. Frequent urinary infections are another concern[7].

Patients with chronic renal failure often experience symptoms that vary with the disease's progression. In the early stages of chronic kidney disease (CKD), patients may not exhibit any symptoms, with noticeable signs typically surfacing in stages four or five. CKD is generally identified through routine blood and urine tests. Common signs at these later stages include nausea, vomiting, appetite loss, fatigue, sleep issues, reduced urine output, decreased mental clarity, muscle cramps, and swelling in the feet and ankles. Additionally, persistent itching, chest pain from uremic pericarditis, breathlessness due to fluid accumulation, uncontrolled hypertension, skin discoloration, and scratch marks from itching can occur, along with uremic frost, where elevated levels of blood urea nitrogen lead to urea in sweat[8].

To diagnose chronic renal failure, kidney function is measured through blood and urine tests to check creatinine levels. Creatinine is a waste product generated from the chemical creatine, which provides energy to muscles and the brain. Furthermore, renal imaging, using ultrasound, evaluates kidney size and can rule out obstructions. Typically, kidneys in chronic renal failure are small, while larger sizes may indicate polycystic kidney disease. Additional tests like IVU, DTPA scans, chest X-rays, and bone X-rays may reveal renal osteodystrophy, and a renal biopsy can also be performed[9,10].

Currently, there is no cure for chronic kidney disease, but various therapies can help manage symptoms, minimize complications, and slow disease progression. Patients with chronic renal illness often need numerous medications. Treatment plans will vary based on the CKD stage. Key treatments include lifestyle adjustments to maintain health, medications to manage related issues such as high blood pressure and cholesterol, and most doctors aim to postpone the need for dialysis or kidney transplants due to the associated risks of severe complications[11,12].

Kidney dialysis primarily consists of two types, each with its own variations. The first type, hemodialysis, involves extracting blood from the patient, which then passes through a dialyzer, often referred to as an artificial kidney[13]. The second method is peritoneal dialysis, where blood is filtered inside the patient's abdomen within the peritoneal cavity that features a large network of small blood vessels. Additionally, there is kidney transplantation, which requires matching the donor and recipient in blood type, cell-surface proteins, and antibodies to reduce the chances of the new kidney being rejected(14). This study aims to address the important issues surrounding the causes and occurrence of chronic kidney failure in the hemodialysis unit of AL-Diwaniya. Moreover, it seeks to fill in the gaps in existing medical and statistical research on kidney failure, its causes, and symptoms, particularly concerning Diwaniya Hospital and the broader context of Iraq.

2. Materials and Methods

A descriptive study with a quantitative approach was carried out involving both males and females in AL Diwaniyah hemodialysis unit for patients with chronic renal failure to identify the primary reasons for people experiencing long-term kidney failure in the hemodialysis center of Al Diwaniya and how to minimize these reasons and Environmental changes associated with kidney failure, in an attempt to mitigate the negative effects of these variables on patients and To assess the risk factors for patients with chronic kidney failure, as well as to assess the causes and chronic diseases that help the spread of this disease. starting from 15th of January of 2021 to 25 February. The study involved a purposive sample of 50 patients who were receiving hemodialysis at the Al Diwaniyah unit and were suffering from chronic kidney failure.

Inclusion criteria:

This research involved 50 patients who took part from the hemodialysis unit in Al Diwaniyah.

Exclusion criteria:

Individuals who are not part of this research include those with mental health disorders.

The purpose of the study was to identify the most common causes of patients renal failure in hemodialysis unit in Diwaniyah and how to minimize these reasons and Environmental changes associated with kidney failure, in an attempt to mitigate the negative effects of these variables on patients. The survey was created by drawing on earlier research and is split into two main sections:

Section one: demographic details for gender

Part Two: Assessment causes chronic renal failure -It consisted of 8 elements such as hypertension, diabetes mellitus, chronic pyelonephritis, chronic glomerulonephritis, urinary calculi, analgesic nephropathy, idiopathic and others which are structured as brief inquiries that patients respond to with either (yes) or (no).

The information for this study was obtained through interviews conducted from January 15 to February 25, 2021, during which we created the questionnaire based on the goals of this research targeting these patients. Once the sample collection was finished, a statistician organized the questionnaires and processed the information using SPSS.

3. Results

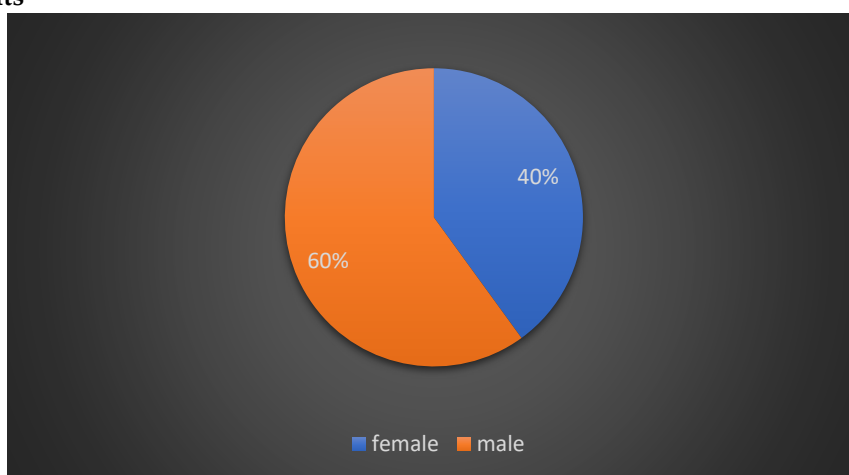


Figure 1. The occurrence of long-term kidney failure in relation to gender.

Table 1. Presents the typical reasons for long-term kidney failure and how often they occur in men and women in Al-Diwaniyah teaching hospital.

Etiology	Total	male	Female
Hypertension	36%	43%	25%
D.M	26%	20%	35%
Chronic Pyelonephritis	8%	10%	5%
Urinary Calculi	6%	10%	5%
Polycystic Kidney	4%	3.3%	5%
Chronic Glomerulonephritis	2%	3.3%	0
Renal Cortical Necrosis	2%	0	5%
Idiopathic	16%	10%	20%

The research took place with fifty patients at the dialysis department in Al Diwaniyah. The patients' ages ranged from 20 to 75 years. Chronic renal failure was found to be more common in males (60%) than females (40%) and the most common cause is high blood pressure (36%) followed by diabetes (26%), chronic pyelonephritis (8%), urinary tract stones (6%), polycystic kidney (4%), chronic glomerulonephritis (2%) and renal Cortical necrosis(2%)and (16%) idiopathic may be due to drugs, toxic substances and birth defects, The most common cause in males was hypertension (43%), diabetes (20%), urinary tract stones (10%), chronic pyelonephritis (10%), (3.3%) for polycystic kidneys, (3.3%) for glomerulonephritis, (10%) Idiopathic. in females The most common cause for females was diabetes (35%), hypertension (25%), polycystic kidney (5%), Renal cortical necrosis caused by dehydration accounts for 5%, chronic pyelonephritis makes up 5%, and idiopathic reasons contribute to 20%, see table 1.

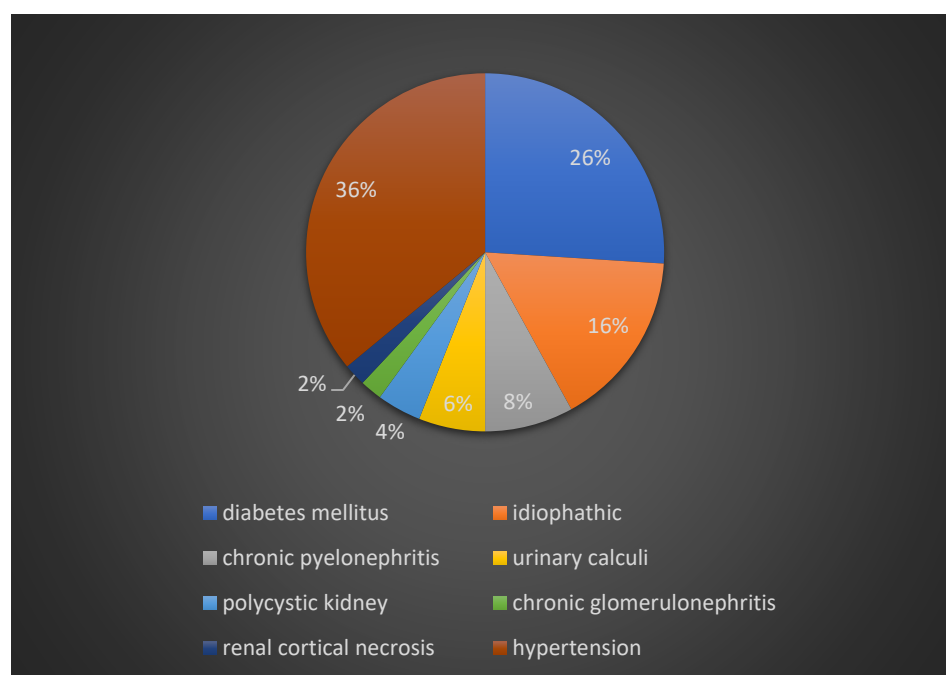


Figure 2. Etiology of chronic renal failure.

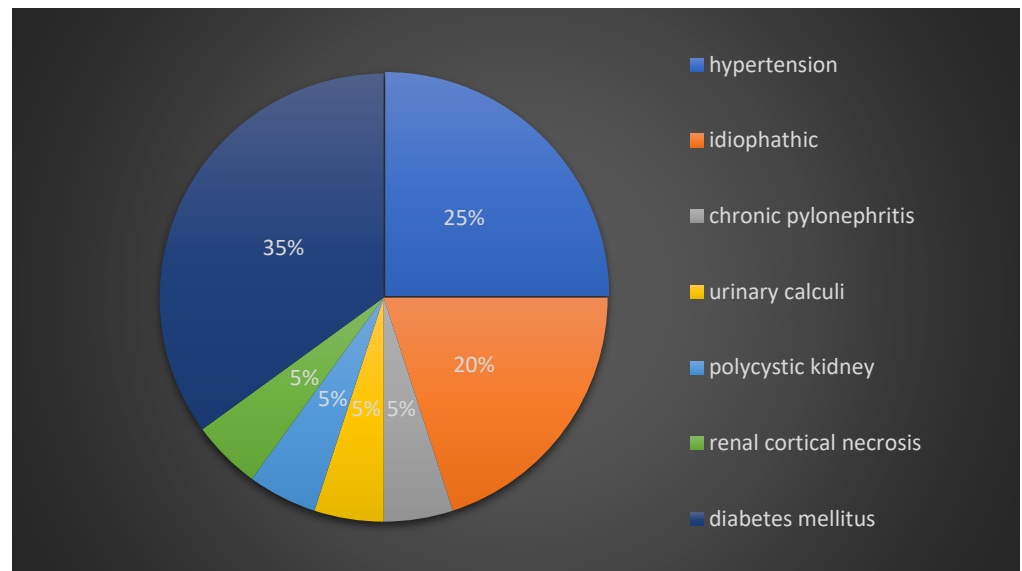


Figure 3. Etiology of chronic renal failure in a female patient (CKF).

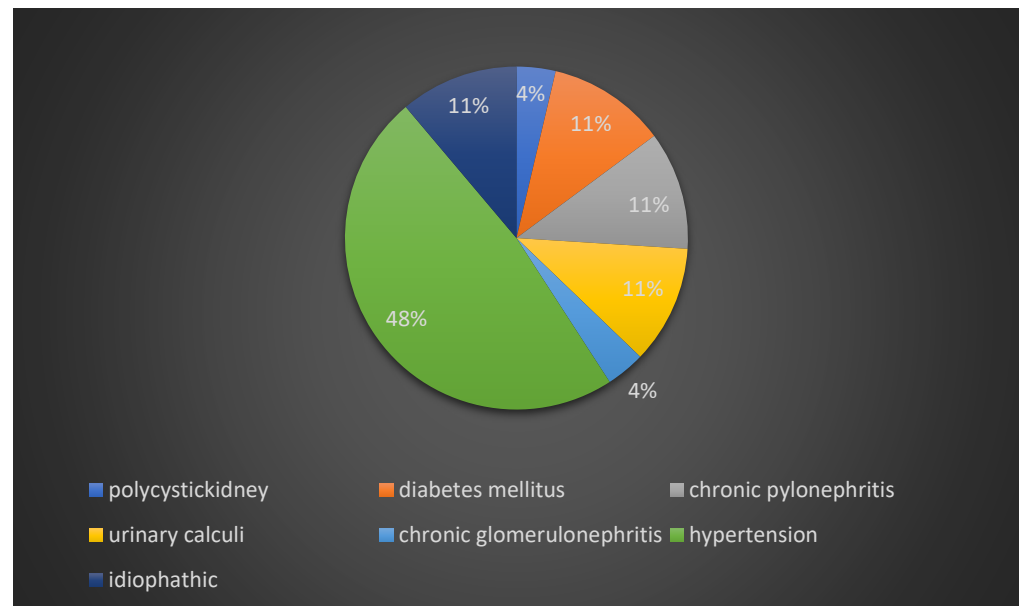


Figure 4. Etiology of chronic renal failure in male patients (CKF).

4. Discussion

This research aimed to analyze the various causes of chronic kidney disease (CKD) in a dialysis facility. CKD is characterized by a gradual decline in kidney function over several months or years. The study revealed that the mortality rate in CKD surpasses the rate of illness. Among the 50 patients we examined, a higher occurrence was noted in males (60%) compared to females (40%). The leading causes identified were high blood pressure (36%), followed by diabetes mellitus (26%). Other causes included chronic pyelonephritis (8%), urinary stones (6%), polycystic kidney disease (4%), chronic glomerulonephritis (2%), and 16% of cases were deemed idiopathic may be due to drugs, toxins and birth defects. The most common causes in males are hypertension (43%) diabetes mellitus (20%) urinary tract stones (10%) chronic pyelonephritis (10%), polycystic kidney 3.3%, 3.3% glomerulonephritis, 10% Idiopathic in females.

The most common causes in females are diabetes (35%), hypertension (25%), polycystic kidneys (5%), cortical necrosis (5%), chronic pyelonephritis (5%), and 25% of unknown causes. Our study is similar to the Patricia Perez study, et al, our results are consistent with it, indicating that Over half of the patients, specifically 52.33%, are aged 60

and older. The age group of 36 to 59 years makes up 39.53%. Regarding male patients, it prevailed by 63.95% (55 cases) over females (31 cases). This is consistent with the study [15].

Among the patients examined, the most common medical history was hypertension, affecting 91.86% of them. This condition was the leading issue for both men and women, with ratios of (29/31) for males and (50/55) for females.

The second most frequent factor linked to Type 2 diabetes was found to be more prevalent in women, with a rate of 53.49% (20 out of 31 cases). Among patients with chronic kidney disease (CKD), those with anatomical issues most frequently reported having kidney stones, accounting for 31.25% of cases, followed by those with bilateral polycystic (28.12%), thirdly, they presented those diseases as tumors (15.63%) [16]. Another study also in Iran conducted by Nagar Morovatdar et al, found in the research results that the average age when ESRD began for 2404 patients was 52.8 years, with a standard deviation of 16.4 years.

High blood pressure (28.3%) and diabetes (24.8%) are the leading causes of end-stage renal disease (ESRD), along with both conditions occurring together (23.4%). Other contributors to ESRD include polycystic kidney disease (2.4%), glomerulonephritis (2.6%), and congenital disorders (0.8%). Notably, we couldn't identify the cause of ESRD in 275 patients, representing 13.1% of the total. In our research, out of 2,404 patients, 538 (22.4%) were younger than 40, 1,543 (64.2%) were between 40 and 70, and 323 (13.4%) were over 70. The reasons for ESRD differ significantly across age brackets. This is consistent with the study [17].

High blood pressure was the leading cause of end-stage renal disease (ESRD) in individuals younger than 40, while diabetes was the main reason for those over 40. Our research indicated a notable difference in the causes of ESRD between genders. For men, hypertension affected 30%, whereas for women, diabetes was slightly higher at 25.4%, compared to 24.4% for hypertension [17]. This information comes from a study led by Manjuri Sharma et al. at the Department of Nephrology in Guwahati Medical College and Hospital, Guwahati, Assam, India. The research involved 5,718 patients with chronic kidney disease who were hospitalized during the study. The year 2005 saw a low number of CKD admissions, but there was a consistent rise, reaching 20.98% by 2015 from just 3.79% in 2005.

The male-to-female ratio stood at 2.59:1. The onset of chronic kidney disease (CKD) occurred at an average age of 40.4 ± 17.3 years. For patients with diabetes mellitus (DM) and hypertension (HTN), the average age at which they were diagnosed was 54.5 years, with the highest number of cases occurring in this age range. In terms of the causes of chronic kidney disease, we found that 42.2% had identifiable reasons, including chronic glomerulonephritis (GN) at 21.4%, hypertension at 19.5%, obstructive uropathy at 6.9%, contrast-induced nephropathy (CIN) at 3.6%, and autosomal dominant polycystic kidney disease (ADPKD) at 1.5%. Additionally, approximately 2.7% of patients were diagnosed with chronic idiopathic kidney disease. Throughout our research, we recognized that diabetes and hypertension were the leading contributors to chronic renal failure in patients at Al-Diwaniyah Teaching Hospital.

Therefore, primary prevention should be provided to them to reduce the prevalence of chronic kidney disease and even reduce environmental pollutants that affect patients and create risk factors. As well as measuring the awareness of patients with their knowledge of this disease and how to deal with it, and also we found that the spread of the disease was in people who have a low social and economic level, so health education and health care about their lifestyle must be provided.

5. Conclusion

Chronic kidney failure is often a significant reason for illness and death and the prevention and proper treatment of hypertension, diabetes mellitus, urinary

calculi, urinary tract infection and other underlying causes can decrease the incidence of this serious disease.

Recommendations

- a. Early detection and control of diabetes.
- b. Control of blood pressure with drugs does not affect kidney function.
- c. Avoid analgesic and other drugs that cause nephrotoxicity.
- d. Proper treatment of UTI and urinary calculi.
- e. Excess fluid and vegetables to increase urine output.

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