

Kidney Failure and Kidney dialysis Causes and Complications for Patients in Az Zawia Kidney Center

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Abstract

The kidney failure could be caused by many reasons, such as diabetes, high blood pressure, polycystic kidneys, and excessive use of some drugs leading to kidney transplantation or kidney dialysis. Dialysis is an instrument filters the blood from metabolic wastes, excess of minerals, drugs and any unwanted substances. Hemodialysis is the common kind of dialysis used in Az Zawia Kidney Center.

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The aim of this study is to investigate the causes and complications associated with kidney failure and kidney dialysis.

This study analysis the data obtained from patients at Az Zawia Kidney Center. The results showed that men and women are equally susceptible to kidney failure, but women might be affected at a younger age. The chronic disease such as diabetes and hypertension increase the risk of having kidney failure. Some patients might suffer from some effects such as vomiting and nausea during hemodialysis sessions. Women might experience some complications in their menstrual cycle such as being irregular or taking long time or accompanied with pain. Pregnancy during hemodialysis could be risky and might end with apportion. Regulating water consumption and suitable food intake is important to avoid unnecessary complication.

Key word: Kidney failure, dialysis, hemodialysis, peritoneal dialysis.

1. Introduction

The kidney works as an excretory and regulatory organ for the body, it contributes in [homeostasis](#), regulating [acid-base balance](#), [electrolyte](#) concentrations, [extracellular fluid volume](#), and [blood pressure](#)¹. Kidney failure could occur due to many causes, such as diabetes, high blood pressure, polycystic kidneys, and excessive use of some drugs leading to kidney transplantation or kidney dialysis^{2,3}. Dialysis is an instrument filters the blood from metabolic wastes, excess of minerals, drugs and any unwanted substances. Kidney dialysis is a treatment used when the body kidneys do not provide an adequate excretion for the daily normal body needs, the extra fluid and wastes will

be removed from body with dialysis. There are two main types of dialysis, hemodialysis and peritoneal dialysis. With hemodialysis small amounts of blood are pumped out of the body through an artificial kidney. This machine filters extra fluid and wastes from the blood; the blood is then pumped back to the body. Each hemodialysis session takes about 4 hours and are done 3 times a week in the dialysis center. For this treatment, a site (an access) where the blood is taken out of the body and then returned to the blood stream is needed; Two needles are inserted into the access, one needle draws the blood out and the other needle returns it back to the body⁴. The second type of dialysis is the peritoneal dialysis where a catheter is put into the abdomen and a special fluid (dialysate) is put into the abdomen through the catheter. The fluid stays in the abdomen for several hours, during this time, the body extra fluid and wastes move from the blood to the dialysate, this fluid is much like urine, and it is then drained from the body through the catheter, Clean fluid is then put into the abdomen, and the steps are repeated⁵.

Dialysis patients need to change their dietary components; typical hemodialysis patients follow diets that are restricted in protein, sodium, potassium, phosphorus and fluids. In both hemodialysis and peritoneal dialysis sodium intake must be modified to avoid complications such as hypertension, congestive heart failure, and pulmonary edema. Fluid consumption should be also controlled to avoid congestive heart failure, pulmonary edema, hypertension and swelling of legs and feet^{6,7}. It is important to ensure sufficient protein is taken to maintain visceral protein store, but to avoid excess that could lead to the accumulation of nitrogenous waste products in the blood “uremia”⁸. A diet with high levels of phosphorus leads to an elevation of its levels in the blood and disrupts calcium/phosphorus balance. Elevated phosphorus levels can

lead to metastatic calcification (soft tissue calcification), secondary hyperparathyroidism, and renal osteodystrophy⁹. Potassium restriction depend on serum potassium levels, the type of dialysis, medication and residual renal function. Patients on hemodialysis are usually restricted to 2000-3000 mg/day to prevent hyperkalemia between treatments, whereas patients on peritoneal dialysis may follow a more liberal dietary potassium intake, as potassium is lost in the dialysate solution during daily exchanges¹⁰.

Amount of fluid allowed depend on volume of urine that kidneys are secreting. In cases of absence of urine 1L/day of fluid intake is allowed for patients, this amount can be increased depends on the amount of urine that is produced by the patients.

Fluids include all beverages, juices, soups, ice-cream, tea, gravy, coffee, and fizzy drinks. excess level of fluid between sessions of hemodialysis lead to complications. Factors that can lead to increased intake of fluid must be avoided; hemodialysis removes extra fluid from body¹¹.

The aim of the study

This study was carried out to investigate the main reasons, complications, presence of other chronic diseases, and physiological functions related to patients who are suffering from kidney failure and go through kidney dialysis.

The experiment

The patients in Az Zawia Kidney Center were contacted, and a questionnaire composed of thirty-four questions was directly handed to the patients. Four questions that were specially raised for the female patients. The questionnaire was composed based on some of previous

studies that were carried on in some other countries such as king Saud university in Saudi Arabia. The questionnaire was answered by twenty-six patients with renal failure within Az Zawia Kidney Center, including 13 males and 13 females. Each patient was asked individually and the questions were explained. All patients agreed to participate in the questionnaire willingly. All patients were from Zawia city and its suburbs, and all of them undergo on dialysis approximately 4 hour per session, 3 times a week. The answers were recorded and classified for further analysis, the patients were very helpful and cooperated nicely, the same questions were directed to each of them individually face to face to ensure that they give enough attention to the questionnaire.

Results

The data were analyzed and summarized in the following categories and figures.

Patient's age

None of the patients is younger than 20 years of age, eight male patients are over 50 years, the majority of female patients (eleven out of thirteen) are between 20 and 50 years, whereas only five out of thirteen males are between the age of 20 and 50 years.

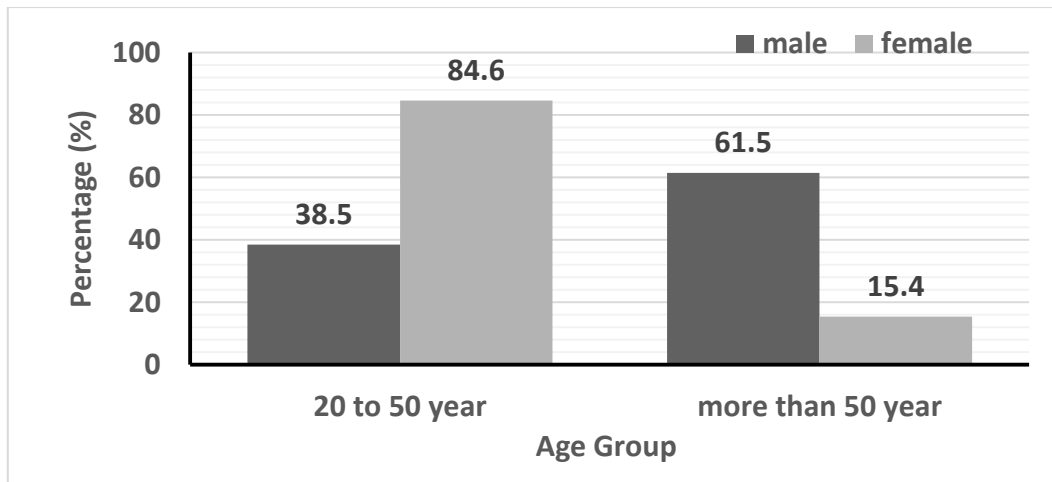


Figure1: Age groups for male and female patients. More than 60% of male patients are above 50 years while more than 80% of the females are 20 to 50 years.

period of dialysis

All patients undergo on dialysis approximately 4 hour per session, three times a week, 14 patients have been on dialysis for more than five year, 9 patients between one and five years on dialysis and only 3 patients on dialysis for less than one year.

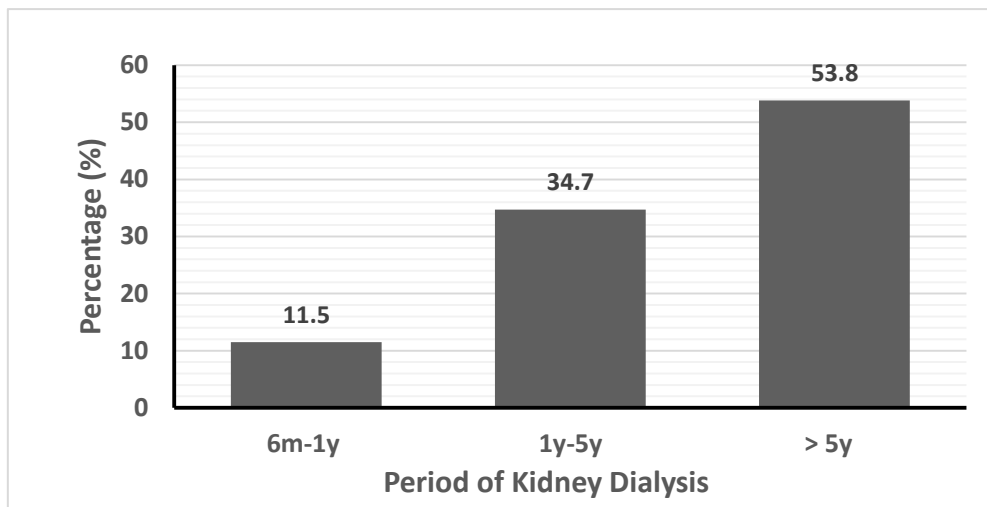


Figure2: Period of dialysis. More than 50% of the patients have been on dialysis for more than 5 years, whereas the new cases represent less than 12% of the cases.

The causes of the kidney failure

Four of the patients suffering from polycystic kidney, four of the patients have diabetes, and seven of the patients suffering from hypertension. The other eleven patients have different other causes such as family history, kidney atrophy, using analgesics tablets frequently, removal of thyroid gland, excess of IgA, frequent drinking of polluted water, abnormal increase of albumen in urine, and physical injury due to a fight.

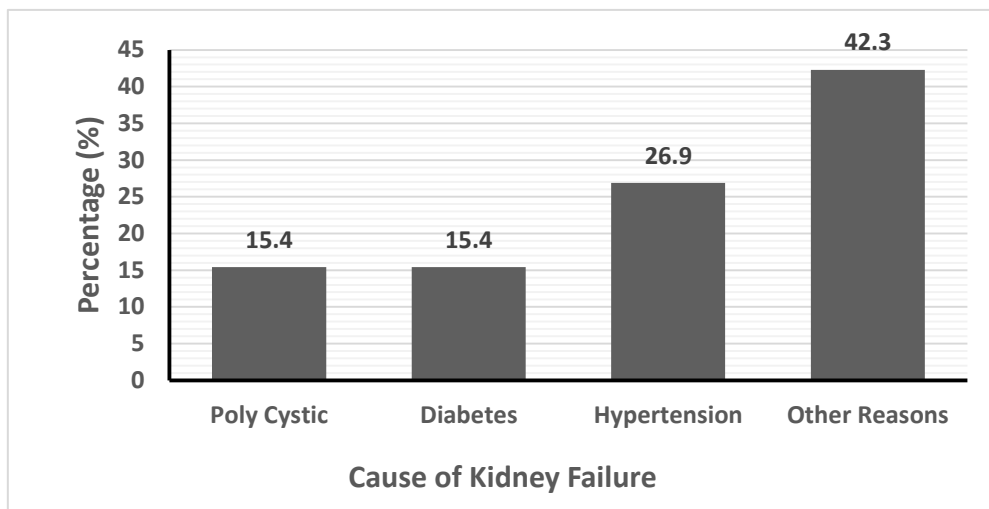


Figure3: The reason of the kidney's failure. The most common reasons are hypertension, diabetes, and poly cystic kidney.

Chronic disease other than kidneys failure

The most common chronic disease, other than kidney failure that the patients have, can be summarized into diabetes, hypertension, and

hepatitis virus. Nineteen out of twenty-six patient have diabetes, and taking medication as insulin injection and metformin. Thirteen out of twenty-six patient have hypertension and some other patients their blood pressure is elevated only on dialysis machine. Six patients have hepatitis C virus, and some patients were infected during dialysis in the center. Eight patients suffering from side effects during dialysis session such as headache, dizziness, muscle cramp, and joint pain.

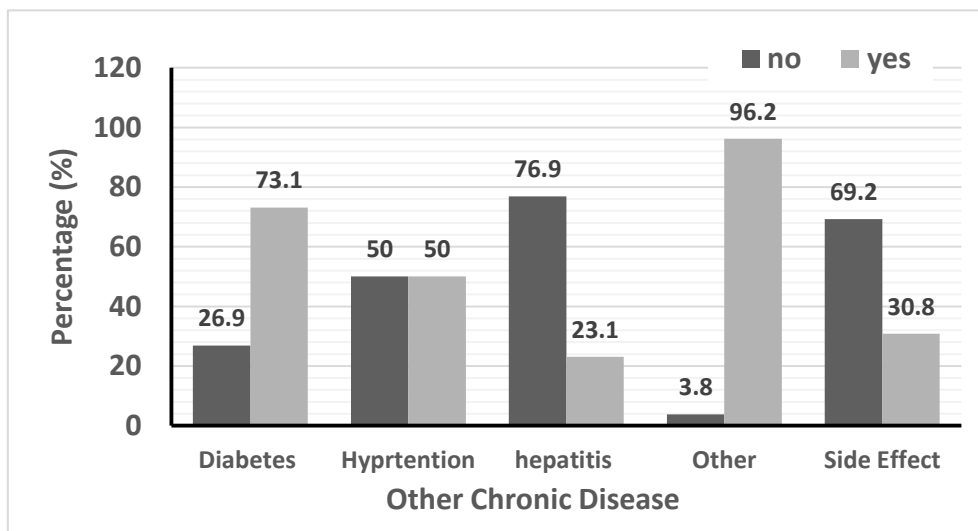


Figure4: Chronic disease other than kidney failure. Diabetes and hypertension are the most common diseases among patients in the center.

Female physiological functions

The data showed that only five female patients had normal menstrual cycles, whereas eight patients have irregular menstrual cycle. One female patient has a long menstruation time, a female patient underwent to hysterectomy (removal of the Uterus), another one her menstruation stopped after starting the dialysis. One patient was pregnant

during dialysis and gave birth, but in the second pregnancy she had an abortion. None of the patients used contraceptive pills.

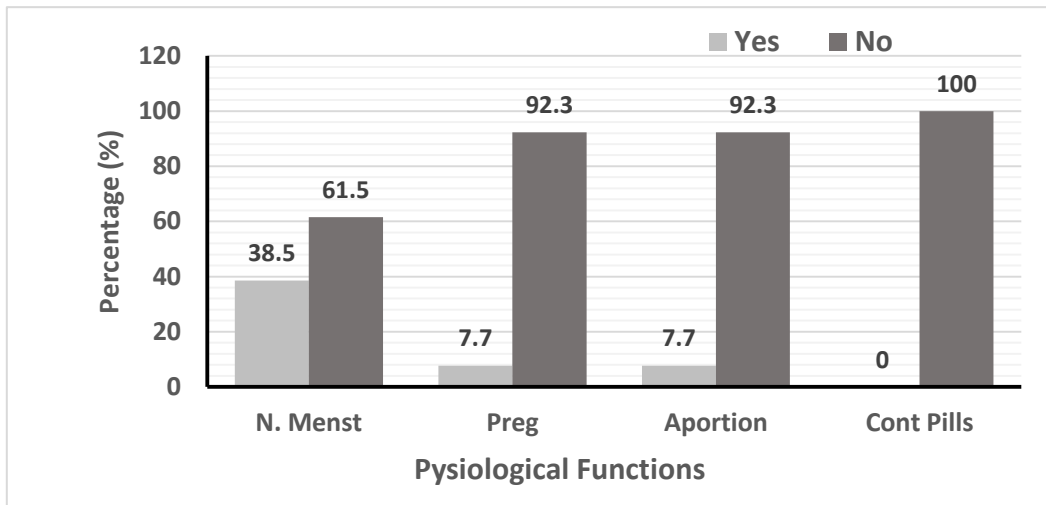


Figure 5: The female physiological functions. Less than 40% of the female patients have normal menstruation (N. Menst), one case 8% of the female patients had pregnancy during dialysis (Preg) and she had abortion in her second pregnancy during dialysis (Aportion). None of the female patients are using contraceptives pills (Cont Pills).

Water consumption

Most of the patients consume between one to two liters of water daily, three of them drink less than one liter daily, and four patients drink more than two liter per day. Some of the patients especially (PCK) patients said that they produce normal amounts of urine, some patients produce reduced amounts of urine, and others don't produce any urine.

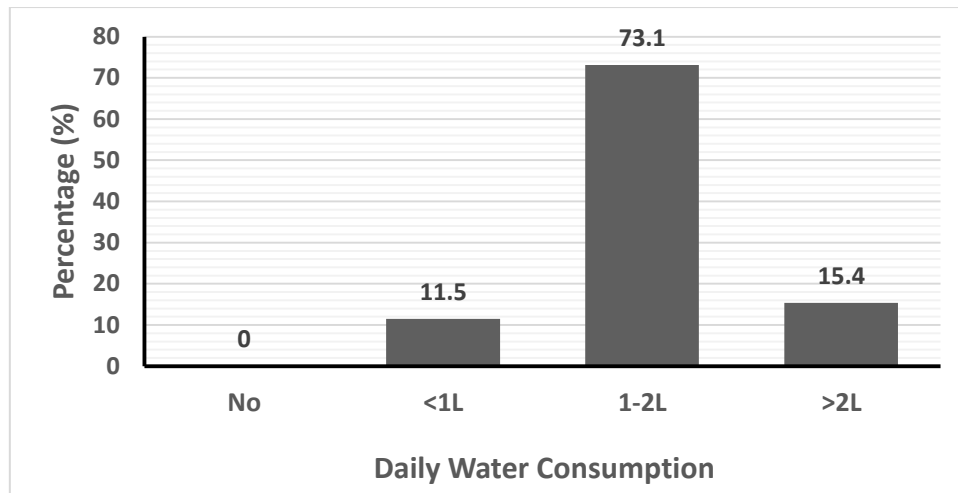


Figure 6: The daily water consumption by patients in the kidneys center. More than 70% of the patients drink between one and two litters daily, whereas patients who consume less than one litter represent less than 12% of the total.

Discussion

Our results showed that more than 80% of female patients are younger than 50 years and more than 60% of male patients are over 50 years. These findings do not agree with the findings by Japanese researchers who suggested that the majority of kidney dialysis patients are between 60 and 85 years¹². The results for female patients cannot be explained without further investigation on the reasons behind this early kidney failure.

The majority of patients were on dialysis for at least one year and less than 12% of the patients on dialysis for less than one year. Four of the patients suffering from polycystic kidney, four of the patients have diabetes, and seven of the patients suffering from hypertension. The other eleven patients have different other causes such kidney atrophy, frequent usage for analgesics, removal of thyroid gland, excess of IgA, frequent drinking of polluted water, abnormal increase of albumen in urine, and

physical injury due to physical attack. The most common chronic disease other than kidney failure that the patients have can be summarized into diabetes, hypertension, and hepatitis virus. More than 73% of patient have diabetes, and taking medication such as insulin injection and metformin. Half of the patient having hypertension. The kidney failure could be due to hypertension and diabetes and the association between diabetes and kidney failure and also between hypertension and kidney failure were proven by other researches¹³⁻¹⁵. Blood pressure of some patients is elevated only during dialysis sessions. About 30% of the patients suffer from side effect such as headache, dizziness, muscle cramp, and joint pain during dialysis sessions. About 23% of patients have hepatitis C virus, and some of the patients were infected during dialysis in the center. The hepatitis virus infection could be due to exposure to the virus in dialysis machines due to the lack of sterilization equipment and materials.

Even though most of the female patients are younger than 50 years of age, less than 40% of them had normal menstrual cycles, all other female patients have either irregular menstrual cycle or the menstrual cycle stopped after starting the dialysis. These results agree with other studies that showed a disturbance in menstrual cycles during dialysis¹⁶. Only one patient was pregnant during dialysis and gave birth, but in the second pregnancy she had an abortion. Studies showed that pregnancy during hemodialysis increase the risk of having severe hypertension for mother and premature delivery for the baby¹⁷.

Most of the patients consume between one to two liters of water daily, about 11% of the patients drink less than one liter daily, and about 15% of the patients drink more than two liter per day. Some of the patients especially (PCK) patients produce normal amounts of urine,

other patients produce reduced amounts or don't produce any urine. In the normal people, it is a good practice to drink water and other fluids such as tea and coffee. For dialysis patients especially who do not produce any urine or produce reduced amounts of urine, any extra fluids will be accumulated in the body causing extra problems for these patients. However, water and fluid intake and water retention are related to consumption of other types of food especially Sodium and proteins^{18,19}. On the other hand, the impaired kidney functions reduce patient's tolerance for medications and might increase the toxicity of drugs that are considered safe for normal people²⁰.

Conclusion

The kidney failure is a chronic condition that can be caused by many factors. Both males and females are equally vulnerable for kidney failure. Diabetic and hypertensive people are more likely to develop kidney failure. Hemodialysis is the common type of dialysis in Az Zawia Kidney Center. The shortage of some equipment and materials causes discomfort for patients and may cause infections to be spread among them. The long dialyzing sessions and the frequents per week make it unpleasant routine. More efforts need to be put by the health service providers in improving the quality of facilities and services that are provided to these patients, and also monitoring the patients' health conditions, and making the patients aware of their conditions and regulate their daily food intake.

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