A SURVEY FOR COMPLICATIONS OF RENAL FAILURE IN AL-DIWANYYIA TEACHING HOSPITAL

A THESIS

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PHARMACY

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بسم الله الرحمن الرحيم

قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ

الْعَلِيمُ الْحَكِيمُ

صدق الله العلي العظيم

سورة البقرة (٣٢)

الإهداء

إلى النور الذي ينير لي درب النجاح . . أبي

وإلى من علمتني الصمود مهما تبدلت الظروف . . أمي

إلى كل من أضاء بعلمه عقل غيره

أو هدى بالجواب الصحيح حيرة سائليه

فأظهر بسماحته تواضع العلماء

وبرحابته سماحة العارفين

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ABBRIVATIONS:

CRD : chronic kidney disease

CRF: chronic renal failure

CKD: chronic kidney disease

CVD: cardiovascular disease

RBCs : red blood cells

Hb: heamoglobin

m :meter

ml:mililiter

GFR: glumerlure filtration rate

ACEI: angiotensin converting enzyme inhibitors

ARB: angiotensin receptor blockers

LDL: low-density lipoprotein

mmole :mili mole

L: liter

min: minute

y: years

Abstract:

This study was carried out to provide further information on the patients with chronic renal failure and any complications for the prevention of what is a life-threatening disorder.

One hundred and six chronic renal failure patients from Teaching Hospital of Al-Diwaniya city were used:- [44] males & [62] females for the period from 1/10/201٧ to 1/3/201٨. We studied the relationship between genders and complications of renal failure. The study showed that Hypertension was most common occur than other complications while Muscle Cramps was the least occur than other complications. In addition, we conclude that the males were more than females with the risk of the dangerous of renal failure complications in Al-Diwaniya city/ IRAQ

Chapter One: INTRODUCTION

Renal failure, also known as end-stage renal disease, is a medical condition in which the kidneys no longer work (1).It is divide into acute kidney failure (cases that develop rapidly) and chronic kidney failure (those that are long term)(2) Symptoms may include leg swelling, feeling tired, vomiting, loss of appetite, or confusion(1) Complications of acute disease may include uremia, high blood potassium, or volume overload.(3)Complications of chronic disease may include heart disease, high blood pressure, or anemia.(4)(5)

Classification:

Acute Renal Failure: is a fast progressive loss of renal job,(6) generally characterized by oliguria (decreased urine production, calculated as fewer than 400 mL per day in adults,(7) fewer than 0.5 mL/kg/h in children or less than 1 mL/kg/h in infants); and fluid and electrolyte imbalance. It can result from a variety of causes, generally classified as prerenal, renal, and postrenal. The underlying cause must be identified and treated to arrest the progress and dialysis may be necessary to bridge the time gap required for treating these fundamental causes.(8)

Chronic renal failure: also known as chronic kidney disease is a progressive loss of renal function over a period of months or years. Firstly, show few signs (9), and might include feeling generally unwell and experiencing a reduced appetite. Chronic renal failure occurs when one suffers from slow and usually permanent loss of kidney function over time. With loss of kidney function, there is an accumulation of water; waste; and toxic substances, in the body, that are normally excreted by the kidney.(10)

Loss of kidney function also causes other problems such as anemia, high blood pressure, acidosis (excessive acidity of body fluids), disorders of cholesterol and fatty acids, and bone disease (10)

The most common causes of CRF are Diabetes Mellitus and long-term uncontrolled Hypertension. (11) Polycystic kidney disease is another well-known cause of CRF. The majority of people afflicted with polycystic kidney disease have a family history of the disease. Other genetic illnesses affect kidney function, as well.

Overuse of common drugs such as acetaminophen (paracetamol), and ibuprofen can also cause chronic kidney disease. (12)

Some infectious disease agents, such as hantavirus , can attack the kidneys, causing kidney failure. (13)

Chronic renal disease is divided into five stages of increasing severity(14)(15):-

The stages of chronic renal disease [table1]

Stage	Description	GFR
Stage 1	Kidney damage with normal or high GFR	90 or above
Stage 2	Kidney damage with mildly low GFR	60-89
Stage 3	Kidney damage with moderately low GFR	30-59
Stage 4	Kidney damage with severely low GFR	15-29
Stage 5	Kidney failure	Below 15

PATHOLOGY:

There are many diseases that cause chronic kidney disease (CKD), each has its own pathophysiology. However, there are common mechanisms for disease progression.

Pathologic features include:

1- Fibrosis

2- Loss of renal cells

3-infiltration of renal tissue by monocytes and macrophages.

4-Proteinuria

5-Hypoxia

6-Excessive angiotensin II production all contribute to pathophysiology.

In an attempt to maintain GFR, the glomerulus hyperfiltrates ; this results in endothelial injury. Proteinuria results from increased glomerular permeability and increased capillary pressure. Hypoxia also contributes to disease progression. Angiotensin II increases glomerular hypertension, which further damages the kidney (16)

Signs and Symptoms:-

The early signs of chronic kidney disease often occur with other diseases, as well. These symptoms may be the only signs of kidney disease until the condition is more advanced. Symptoms may include:(17)

• General ill feeling and tiredness

• Generalized itching (pruritus) and dry skin

• Headaches

• Weight loss without trying to lose weight

• Appetite loss

• Nausea

Other symptoms that may develop, especially when kidney function has worsened: (17)

• Abnormally dark or light skin

• Bone pain

•Brain and nervous system symptoms

- Drowsiness and confusion
- Problems concentrating or thinking
- Numbness in the hands, feet, or other areas
- Muscle twitching or cramps

• Breath odor

• Easy bruising, bleeding, or blood in the stool

• Excessive thirst

• Frequent hiccups

•Low level of sexual interest and impotence

• Menstrual periods stop (amenorrhea)

• Sleep difficulties, such as insomnia, restless leg syndrome, and obstructive sleep apnea

• Swelling of the feet and hands (edema)

• Vomiting, typically in the morning

Diagnosis:

Chronic kidney failure is measure in five stages, which are calculated using a patient's GFR, or glomerular filtration rate. A normal GFR varies according to many factors, including sex, age, body size and ethnic background.

Blood tests: Kidney function tests look for the level of waste products, such as creatinine and urea, in your blood.

Urine tests: Analyzing a sample of the urine may reveal abnormalities that point to chronic kidney failure and help identify the cause of chronic kidney disease.

Imaging tests: use ultrasound to assess your kidneys' structure and size. Other imaging tests may be used in some cases.(18)(19)

Complications of Renal failure

1-Anemia

Anemia is defined as a reduction in one or more of the major red blood cells (RBCs) measurements; hemoglobin concentration, hematocrit, or red blood cell count. The World Health Organization defines anemia as a hemoglobin level less than 13 g/ld. in men and post-menopausal women, and less than 12 g/ld. in pre-menopausal women (20).

A normochromic, normocytic anemia usually accompanies progressive chronic kidney disease (CKD) (21), and the overall prevalence of CKD-associated anemia is approximately 50%(22).

Although anemia may be diagnosed in patients at any stage of CKD, there is a strong correlation between the prevalence of anemia and the severity of CKD. One quarter of stage 1 CKD patients, half of those stratified to CKD

Stages 2, 3, and 4 and three quarters of CKD patients starting dialysis suffer from anemia (22).

Therefore, primary care providers play an important role in diagnosing and treatment anemia in CKD patients.

Anemia in CKD can result from multiple mechanisms (iron, folate, or vitamin B12 deficiency; gastrointestinal bleeding; severe hyperparathyroidism, systemic inflammation, and shortened red blood cell survival), decreased erythropoietin synthesis is the most important and specific etiology causing CKD-associated anemia.

Erythropoietin is a glycoprotein secreted by the kidney interstitial fibroblasts (23) and is essential for the growth and differentiation of red blood cells in the bone marrow .

• Anemia in to CKD usually starts to develop when the GFR is less than 60 mL/min/1.73m^{2}The prevalence of anemia increases markedly with decreasing GFR.

Management

• Other forms of anemia should be considered and excluded.

- B12 and folate levels should be checked and corrected if deficient. (24)

2- Acidosis

People with GFR < 30 mL/min/1.73m^2 are at increased risk of metabolic acidosis. The main factor is reduced renal acid excretion compounded by a reduction in bicarbonate production. Acidosis contributes to demineralization of bone and increased protein degradation, which may be associated with increased morbidity.

Management:

• Supplementation with sodium bicarbonate (Sod Bicarbonate 840 mg capsule) may be considered in patients with acidosis

• Increased sodium load may worsen blood pressure control in CKD.

3-Albuminuria:

Albuminuria is an important prognostic feature in CKD. The degree of albuminuria relates to the severity of the kidney disease and with a greater likelihood of progression to end stages of CKD. The amount of albuminuria can be decrease significantly by the use of an ACE inhibitor or ARB agent. Reduction in the amount of albuminuria is associated with improved outcomes.

Management

• ACE inhibitor or ARB as first-line therapy

• Reduction in salt output through reducing oral salt intake

• Spironolactone (25)

4-Hypertension:

Hypertension in patient are both a cause of CKD and a complication of CKD and can be difficult to control. The risks of uncontrolled hypertension include progression of kidney disease and increased risk of coronary heart disease and stroke. Hypertension should be considered as part of absolute cardiovascular risk

Management:

• Multiple medications (often 3 or more drugs) are needed to control hypertension adequately in most people with CKD.

• Consider sleep apnoea as a cause of resistant hypertension.

• People with diabetes or proteinuria should be treated with an ACE inhibitor or ARB as first line therapy.

• When treatment with an ACE inhibitor or ARB is initiated , the GFR can decrease and potassium levels can rise.(26)(24)

5-Hyperkalemia:

In CKD, excretion of potassium (K+) in the urine is impaired. Levels may also increase with ACE inhibitors and ARBs used to treat hypertension or

with use of spironolactone. Levels consistently more than 6.0 mmol/L are of concern and should be managed . Hyperkalemia, especially levels > 6.5 mmol/L, predisposes to cardiac arrhythmias.

Management:

• Decrease K+ diet

• Correct metabolic acidosis (target serum HCO3 > 22 mmol/L)

• Potassium wasting diuretics (e.g., thiazides)

• Avoid salt substitutes which may be high in K+

• Cease ACE inhibitor/ARB/ spironolactone if K+ persistently > 6.0 mmol/L and not responsive to above therapies

• Refer to nearest Emergency Department if K+ more than 6.5 mmol/L(25)

6- Dyslipidemia:

Dyslipidemia is a major risk factor for cardiovascular morbidity and mortality and is most common in People with CKD. Lipid profiles change widely in these patients,

reflecting the level of kidney function and the degree of proteinuria(٢7). In general, the prevalence of hyperlipidemia increases as renal function

Decline ،With the degree of hypertriglyceridemia and elevation of Low density lipoprotein (LDL) cholesterol being proportional to the severity of renal impairment. Patients with CKD have a reduction in the activity of lipoprotein lipase and hepatic triglyceride lipase. This interferes with uptake of triglyceride-rich, apolipoprotein B-containing lipoproteins by the liver and in peripheral tissue, yielding increased circulation of these atherogenic lipoproteins. Hypercholesterolemia in nephrotic syndrome is thought to be due to increased production and reduce catabolism of lipoproteins. The level of lipoprotein abnormality is roughly proportional to the amount of proteinuria and inversely proportional to serum albumin levels. However, infusions of albumin or dextran both normalize lipoprotein concentrations, suggesting that oncotic pressure changes rather than hypoalbuminemia signals increased lipoprotein synthesis by the liver.(28)

Additional data supporting this hypothesis is derived from in-vitro experiments demonstrating direct

stimulation of increased hepatic apolipoprotein-B gene transcription in cells exposed to reduced oncotic pressure(٢8). Studies also suggest that hyperparathyroidism and the accumulation of calcium in pancreatic islet cells likely contribute to dyslipidemia of CKD as well (٢9)

CKD is associated commonly with substantial abnormalities of lipid metabolism, including increased low-density lipoproteins, triglycerides, very

low-density lipoproteins (LDL), and lipoprotein (a), and reduced levels of high-density lipoprotein cholesterol. Dyslipidemia is more severe in individuals with albuminuria, particularly those with nephrotic syndrome.

Management:

• In adults with newly identified CKD, evaluation with a fasting lipid profile is recommended.

• Consider secondary causes and specialist evaluation if severely elevated fasting lipid levels (LDL cholesterol >4.9 mmol/L or triglycerides >11.3 mmol/L).

• Follow-up measurement of lipid levels is not required for the majority of patients.

• If aged ≥50 years with any stage of CKD (irrespective of lipid levels):

- Statin if GFR is > 60 mL/ min/1.73m^2

- Statin or statin/ezetimibe combination if GFR is ≤ 60 mL/ min/1.73m^2.

• If aged less than 50 years with any stage of CKD (irrespective of lipid levels):

- Statin if presence of one or more of: coronary disease, previous ischaemic stroke, diabetes or estimated 10-year incidence of fatal or non-fatal myocardial infarction above 10%

• Lifestyle advice if hypertriglyceridaemia is present (٣0)(31)

7-Bone disorder:

The term “CKD-associated mineral and bone disorders” comprises abnormalities in bone and mineral metabolism and/or extra-skeletal calcification secondary to CKD pathophysiology (32)(33).

Renal osteodystrophy is the spectrum of histological changes, which occur in bone architecture of people with chronic renal failure . The kidney is the primary site for phosphate excretion and 1-α-hydroxylation of vitamin D. (CKD) patients develop hyperphosphatemia as a result of inadequate 1, 25 dihydroxy-vitamin D levels that reflect decreased synthesis from parenchymal scarring. In addition, renal phosphate

excretion is decrease. Together both processes cause, serum calcium levels to fall resulting in increased secretion of parathyroid hormone(secondary hyperparathyroidism). Parathyroid hormone has a phosphaturic effect. It also increases the calcium levels by increasing bone resorption and promoting 1-α-hydroxylation of 25-hydroxy vitamin D synthesized by the liver (limited effect because of reduced kidney reserve from scarring).

Rising phosphorus levels are almost universally observed in stage 3(CKD) patients. However, secondary hyperparathyroidism often begins to distort bone architecture earlier before serum phosphorus is noted to be abnormal, indicating that phosphate binder therapy needs to be initiated when GFRs have declined below 50 mL/min per 1.73m^2.(34)

Changes in bone architecture can be due to either a high bone turnover state or a low bone turnover state. Four types of bone phenotypes (renal osteodystrophy) can be diagnosed in CKD patients: osteitis fibrosa cystica (high bone turnover with secondary hyperparathyroidism), Osteomalacia (low bone turnover and inadequate mineralization, primarily related to diminished vitamin D synthesis), adynamic bone disorder (low bone turnover from excessive suppression of the parathyroid glands), and mixed osteodystrophy (with elements of both high and low bone turnover).

The predominant type of renal osteodystrophy and CKD-mineral and bone disorder differs between pre-dialysis and end stage renal disease patients.(34)

In pre-dialysis patients, high bone turnover bone disease is most prevalent. In contrast, low bone turnover predominates in dialysis patients. Patients with low turnover disease represent the majority of cases of renal osteodystrophy(34).

The cause of this prevalent bone phenotype results from oversuppression of parathyroid hormone and high calcium dialysate concentrations(35).

Acidosis, the suppressive effect of phosphate retention on renal synthesis of 1, 25 dihydroxyvitamin D synthesis, and absence of the physiologic inhibitory effect of vitamin D on parathormone secretion are also minor factors that contribute to the low turnover bone disease in CKD patients (36)

Management:

• Phosphate

- Dietary restriction of phosphate

- Use of phosphate binders, which bind dietary phosphate to prevent absorption. Commonly used binders are typically calciumbased. - Sevelamer and lanthanum are available for patients on dialysis.

• Calcium

- If phosphate is controlled, calcium will typically remain in normal range. If the level is low with normal phosphate level consider Vitamin D supplementation.

- Excess calcium administration should be avoided as this may be associated with increased risk of vascular calcification in CKD (25)(37) .

• Vitamin D

- Cholecalciferol, the form of vitamin D that comes from sun exposure, can be given as a dietary supplement and will be converted to 25-hydroxyvitamin D by the liver.

- If kidney function is still intact, it will then be converted to calcitriol, the most active form and will help to suppress the development of secondary

hyperparathyroidism

- Calcitriol, the most active form of vitamin D is used in CKD for suppression of secondary hyperparathyroidism and is the preferred vitamin D in later stages of

CKD when kidney function is very poor. Cholecalciferol should still be used for 25-hydroxyvitamin D deficiency in advanced CKD, including in combination with calcitriol

• Cinacalcet - Cinacalcet, a calcimimetic agent, can be used to management hyperparathyroidism for individuals on dialysis

- In people with CKD and severe hyperparathyroidism who fail to respond to medical/ pharmacological therapy, parathyroidectomy should be considered, particularly when calcium or phosphate levels cannot be satisfactorily controlled (25)(37)

8-Muscle cramps:

Many patients with chronic kidney failure may experience muscle cramps caused by imbalances in fluid and electrolytes, peripheral neuropathy or peripheral vascular disease.

Management:

• Encourage stretching and massaging of the affected area

• Tonic water can be effective for frequent cramps

9-Pruritus

Itchy skin is a common and debilitating side-effect of kidney disease, and can affect up to 70% of Patients with Stage 4 or 5 CKD. The causes are multifactorial, including calcium and phosphate imbalance, inadequate dialysis,

overactive parathyroid gland activity, high levels of magnesium and vitamin A, and nerve changes in the skin(36).

Management:

• Ensure that there are no other causes for pruritus (e.g., allergies, scabies, inadequate dialysis, calcium/ phosphate)

• Evening Primrose Oil

• Skin emollients (36)

10-Uraemia:

Uraemia is a syndrome seen in Stage 4 or 5 CKD, and is caused by the accumulation of the breakdown of protein. The symptoms include anorexia, nausea, vomiting, lethargy, confusion, muscle twitching, convulsions and coma. Although urea and creatinine are the substances we measure, the symptoms are most likely due to the accumulation of other toxic end products . These symptoms can lead to poor food intake and malnutrition.

Management:

• Dialysis should be commenced as soon as uraemic symptoms develop

• If non-dialysis pathway is planned:

- a low protein diet will help control gastrointestinal symptoms

- anti-emetics are of limited value (38)

Chapter Two:

Patients AND Method

It is a descriptive statistical study. Data collected from Teaching Hospital in Diwaniyah city /IRAQ. We started filling out the data from 1/10/2017 to 1/3/2018. Data collection was obtained through filling the researcher's questionnaire considering the followings: - Gender, age and Hypertension, Anemia, Acidosis, Albuminuria, Hyperkalemia , Dyslipidemia ,Muscle cramps , Pruritus ,Uremia & Bone disorder complications. In addition, General physical examination and systemic evaluation were carried out; patients were also examining for other renal disease complications. We were able to obtain the required data of [106] cases for this research, [44] Males & [62] females renal failure patients.

Chapter Three:

Results

The results showed in table(2) that Hypertension[71%] has been most common than other complications then anemia[53%] , bones disorder[33%] while muscle cramps[3%] was the least occur than other complications.

Table (2) illustrate the complication and their percentage

Complications	No of patients	Percentage= compls/sum *100%
CVD	76	71%
ANEMIA	57	53%
BONES DISORDER	34	33%
ACIDOSIS	17	16%
Hyperkalemia	10	9%
Dyslipidemia	9	8%
Pruritus	5	4%
Muscle cramps	4	3%
106		

The results have been showed in figure (1) that the occurrence of cardiovascular diseases is the most common in comparison with other complications that we found in Teaching Hospital in Diwaniyah city during the period of study. While the occurrence of Pruritus is the least complication in comparison with other complications.

In addition, our results have been showed in figure (2) that the percentage of chronic renal failure complications in male (41%) more than the percentage of diabetes complications in female (59%) during the study period.

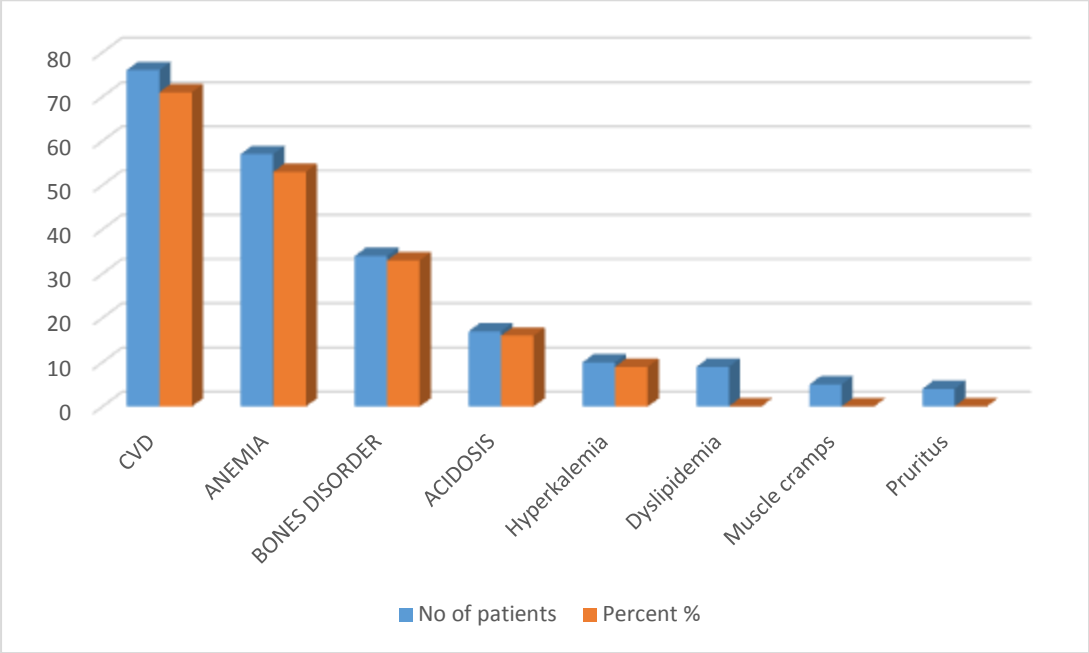

Figure (1) complications of chronic renal failure

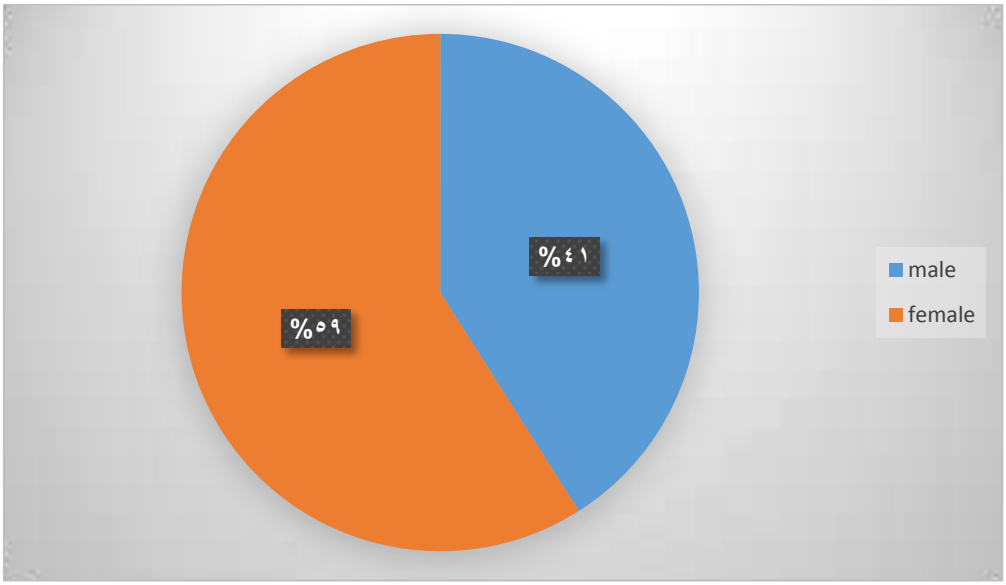

Figure (2) percentage of complications in males and females

The results of the present study as shown in figure (3) that the occurrence of cardiovascular diseases is the most common in male while the bone disorders are the most common in female. And the occurrence of Muscle cramps is the least common in both male and female.

Anemia complication of chronic renal failure as shown in figure (3) is most common in the age group (20-30y) while it's occurrence in the age group (10-20y) is the least .

For cardiovascular diseases complication also most common occur in the age group (60-70y) while it's occurrence in the age group (0-10 and 10_20y) is

the least.

For bones disorder complication most common occur in both age groups (20-30y) while their occurrence in the age groups (0-10 and 10-20y) are the least.

For acidosis complication we found that this complication most common occur in the age group (40-50) while their occurrence in the age groups (0-10 and 10-20) are the least.

For other complications in general there is no difference between it's occurrence in all age groups.

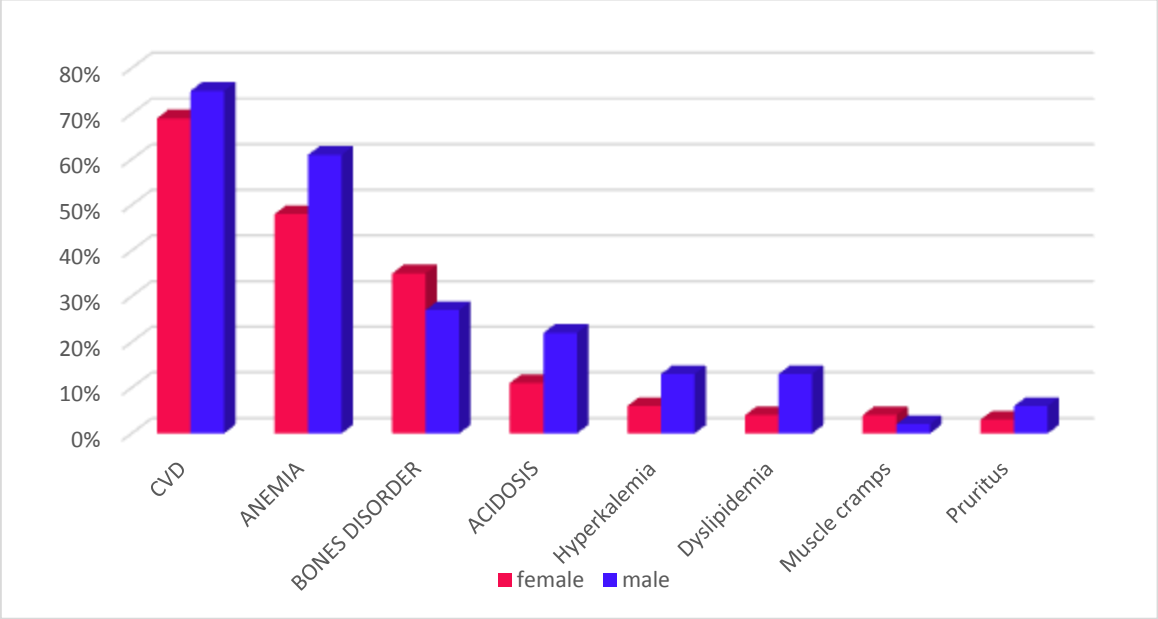

Figure (3) complications of chronic renal failure for both males and females

Table3: (distribution of complication in male)

complications	No of patients	Percentage= compls/sum *100%
CVD	33	75%
ANEMIA	27	61%
BONES DISORDER	12	27%
ACIDOSIS	10	22%
Hyperkalemia	6	13%
Dyslipidemia	6	13%
Muscle cramps	1	2%
Pruritus	3	6%
44		

Table5: (distribution of complication in female)

complications	No of patients	Percentage= compls/sum *100%
CVD	43	69%
ANEMIA	30	48%
BONES DISORDER	22	35%
ACIDOSIS	7	11%
Hyperkalemia	4	6%
Dyslipidemia	3	4%
Muscle cramps	3	4%
Pruritus	2	3%
62		

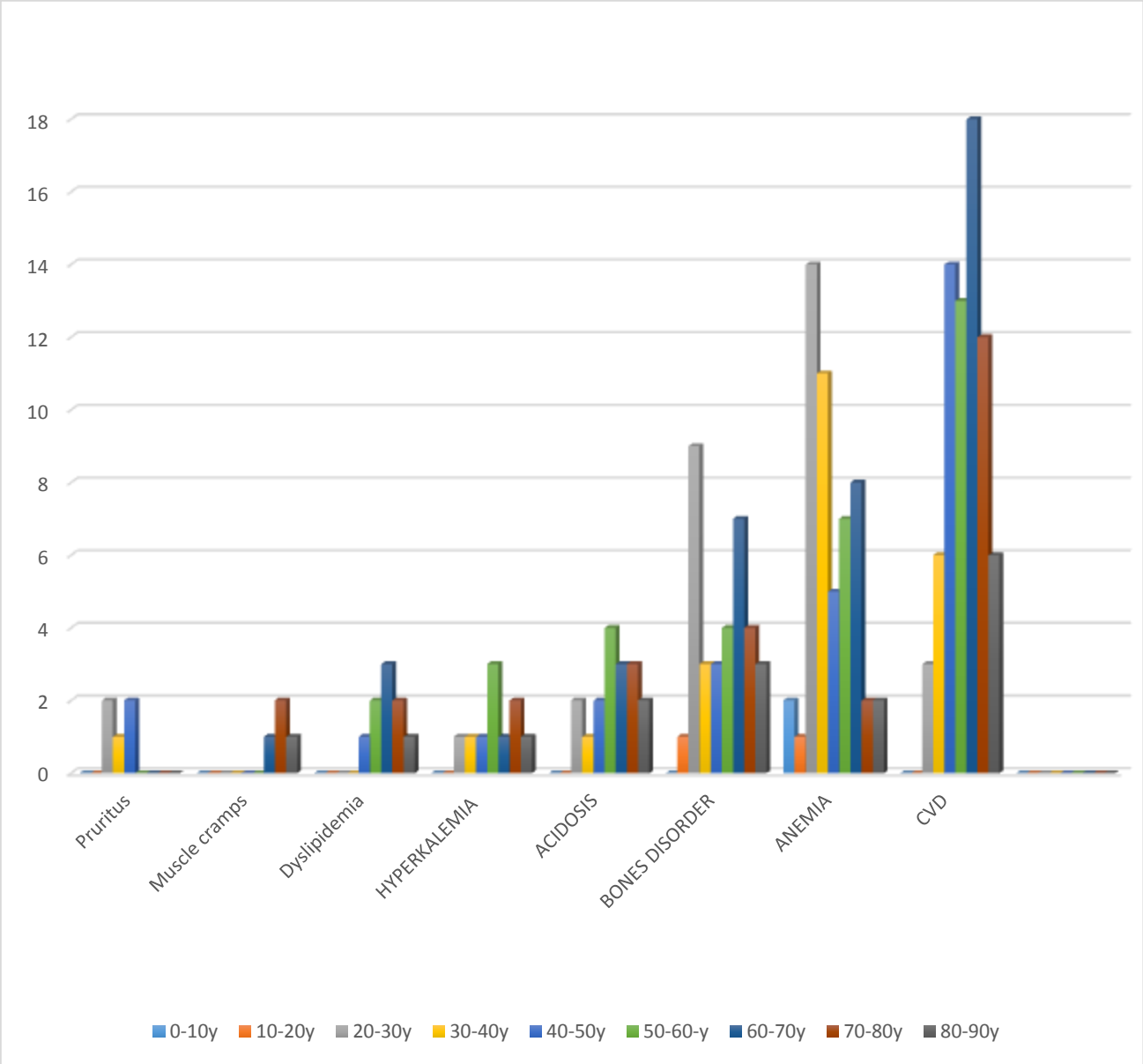

Figure (4) the relationship between each complication and age

Chapter Four: Discussion

Chronic kidney disease (CKD) is recognized as a major health problem in population Numbers of prevalent CKD patients will continue to rise, reflecting the growing elderly population and increasing numbers of patients with diabetes and hypertension. As numbers of CKD patients increase, primary care practitioners will be confronted with management of the complex medical problems unique to patients with chronic renal impairment (39)

From the result, Renal failure and its complications is widespread between people, including those who lived in Al-Diwaniya city. The most Risk factor for development of Renal failure in patients have diabetes ,hypertension ,established cardiovascular disease , a family history of kidney failure , are obese (body mass index ≥ 30 kg/m2) ,are a smoker ,are 60 years or older, and , have a history of acute kidney injury (AKI)

Through the [figure 1], we can see that the most widespread complication is cardiovascular disease according to the data that was obtained from statistics center in Al-Diwaniya teaching hospital and from examination diabetic center. The second more common complication according to this research is anemia, the third common complication is Bone disorder-The forth more common complication is Acidosis- the fifth most common complication is hypertension –the sixth most common complication is Dyslipidemia –the seventh and eighth most common complication are muscle cramp and pruritus frequently.

In the [figure 2], we can see that the complications of renal failure presented with people of Al-Diwaniya city is more widespread in female than in male. The percentage in female is 59% and in male is 41%

In figure (3) in our result the comparison between complication according to age of patients show that for anemia complication of chronic renal failure as shown in figure 3 is most common occur in the age group (20-30y) while it's occurrence in the age group (10-20y) is the least .

For cardiovascular diseases complication also most common occur in the age group (60-70y) while it's occurrence in the age group

(0-10 and 10_20y) is the least.

For bones disorder complication most common occur in both age groups (20-30y) while their occurrence in the age groups (0-10 and 10-20y) are the least.

For acidosis complication we found that this complication most common occur in the age group (40-50) while their occurrence in the age groups (0-10 and 10-20) are the least.

Chronic kidney disease (CKD) is common in the elderly, leading some professional organizations to recommend routine age-based screening for CKD in the primary care setting3; however, relatively little is known about the clinical course of CKD in older individuals.

Most previous studies of CKD and current recommendations for its management have not distinguished between patients of different ages , and efforts to identify risk factors for progression of CKD have generally focused on patient characteristics other than age.4–17 (40) that agree with our result that most common in elderly patients in Diwaniya teaching hospital , Age differences in the prognostic significance of GFR observed here probably reflect a variety of different phenomena. The lower incidence of ESRD among older compared with younger patients with similar levels

Of GFR is likely due, at least in part, to their greater competing risk for death.(37 -39)

Other considerations include the greater likelihood that older patients in this prevalent cohort are CKD survivors and thus by definition have non-progressive

or slowly progressive disease. Differences in outcomes may also reflect age differences in the underlying cause of low GFR. Perhaps in older patients, low GFR functions more commonly as a “marker” for a variety of other age-related coexisting comorbid conditions and thus tends to be a better predictor of “global” health outcomes (e.g., mortality) than of more “specific” renal outcomes. In contrast, in younger patients, perhaps low GFR results more frequently from a single disease affecting the kidney and thus may better predict renal outcomes to occuraspart of “normal” aging .(39 -40)

CKD progression may differ depending on sex Male patients show higher prevalence of CKD and incidence rate of ESRD than observed in female (41). This do not agree with our result that female(59%) have more complication than male(41%)

Poor blood pressure and control, Cultural and social environment differences, difference in treatment prescription or disease perception and biologically influences (Hormonal and Genetic factor) were shared risk factor for renal progression in male and female

The risk factors in patients with renal failure to develop cardiovascular disease are increase cholesterol low density lipoprotein blood pressure diabetes and smoking

All have been associated with risk for cardiovascular disease (CVD)

The risk rises incrementally with decline in GFR and is maximal with end stage kidney disease other factor including proteinuria , left ventricular hypertrophy, impaired calcium-phosphate homeostasis , anemia and inflammation contribute to (CVD) risk in this population .

Chapter Five:
Conclusion

We conclude from my survey that:

- The gender of the patient who has renal failure may play a major role in the manifestation and development of the complications. The results of this study concluded that female with renal failure who suffering from the complications are at more risk than male.
- During the period of survey or study we conclude that cardiovascular disease the most occurrences in patients with renal failure while pruritus and muscle cramp the least occurrence among them.
- The age of the patient who has renal failure and the presence of other disease also has an effect on the manifestation and occurrence of the complication.

Chapter Six:

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