Patients’ knowledge and Attitude regarding to Chronic Renal Failure and its Management in hemodialysis unit, Omdurman Teaching Hospital, Khartoum State, Sudan (2013)

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B.SC.in Nursing Sciences

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A Dissertation

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Patients’ knowledge and Attitude regarding to Chronic Renal Failure and its Management in hemodylsis unit, *Omdurman Teaching Hospital*, Khartoum State, Sudan (2013)

SafiaAbasHamza Omar

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Patients’ knowledge and Attitude regarding to Chronic Renal Failure and its Management in heamodylsis unit, *Omdurman Teaching Hospital*, Khartoum State, Sudan (2013)

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Date: January, 2014
DEDICATION

TO THE CANDLE WHICH BURNS TO LIGHT MY LIFE
THE GREATEST LOVE TO MY MOTHER, FATHER AND MY HUSBAND
TO THOSE WHO HAVE MADE IT POSSIBLE, THOSE WHO ALWAYS IN MY
SIDE, MY BROTHERS, SISTERS AND DAUGHTERS
Acknowledgement

This study was not only my own effort, but also many hands were contribute for presenting it in this way,

First, I am greatly indebted to the supervisor Dr. Hanan Mabrouk Ramadan and the second supervisor Dr. Ietimad Ibrahim Kambah.

So my gratitude’s and thanks go to their kind and help. Splendid guidance and close supervision during the course of this study; her help left appreciable remark through this study.

My thanks should be extended to Omdurman Hospital, Renal unit, colleagues and patients etc….., for their concern and help in data collecting.

Last, may thanks to all who helped me in any way.
Patients’ knowledge and Attitude regarding to Chronic Renal Failure and its Management in heamodylsis unit, Omdurman Teaching Hospital, Khartoum State, Sudan (2013)

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Abstract

Renal failure is considered as the most widespread health problem in Sudan and the world. The study aimed to assess the patients’ knowledge and attitude regarding to chronic renal failure and management in heamodylsis unit in Omdurman Teaching Hospital, Khartoum State, Sudan during the period from September 2012 to October 2013. The sample size consisted of (100) available patients. The data was collected using a questionnaire is designed for the purpose of the study. The data analyzed by using statistical package for social science (SPSS). The study showed that renal failure spread among male with 62% and 38% for female aged 45-55 years. Also it’s spread among the low economic class of 52% of cases and 27% from intermediate education level. The study showed that 42% of patients didn't know about chronic renal failure, 66% do routine investigation regularly, 63% regularly follow-up 58% of patients didn't know amount of protein allowed with positive attitude regarding their illness. The study conducted that the patients' knowledge were slightly adequate toward their illness and its management and their attitude were positive.
معرفه معلومات واتجاهات مريض الفشل الكلوي عن مرضه وعلاجه بوحدة الغسيل الديموع
بمستشفى أم درمان التعليمي، ولاية الخرطوم، السودان (2013)

صفحه عباس حمزة عمر

الخلاصة

يعتبر مرض الفشل الكلوي من المشاكل الصحية الأكثر انتشارا في العالم وفي السودان. هدفت هذه الدراسة الوصفية لمعرفة معلومات واتجاهات مريض الفشل الكلوي عن مرضه وطرق علاجه بوحدة الغسيل الديموع بمستشفى أم درمان التعليمي بأمدرمان خلال الفترة من أكتوبر 2012م وحتى سبتمبر 2013م. تم تصميم استبيان من أجل الدراسة وثم تحليل البيانات باستخدام الحزمة الإحصائية للعلوم الاجتماعية (SPSS) وكانت العينة مائة من المرضى المتواجدون في فترة الدراسة. أوضحت الدراسة بأن مرض الفشل الكلوي أكثر إصابة بنسبة 62% بين الرجال من النساء ومن عمر 45-55 سنة. كما أوضحت الدراسة أن 42% من المرضى لا يعرفون معنى المرض بينما 66% يقومون بإجراء الفحوصات الطبية اللازمة بانتظام و58% لا يعرفون كمية البروتينات اللازمة لهم بينما كانت اتجاهاتهم إيجابية تجاه المرض. خلصت الدراسة على أن معلومات المرضى كانت كافية إلى حد ما واتجاهاتهم إيجابية تجاه مرضهم. أوصت الدراسة إلى أهمية التثقيف الصحي والتواعي الصحية بعمل العديد من البرامج المرئية والمسموعة والمقروة حتى نساهم في خفض انتشار مرض الفشل الكلوي.
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<td>CRI</td>
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<td>PH</td>
<td>Percentage of hydrogen in the blood</td>
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<td>End stage renal failure</td>
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<td>Ultra urether test</td>
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<td>CUTI</td>
<td>Chronic urinary tract infection</td>
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<td>NKF</td>
<td>Normal potassium flow</td>
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<td>HCV</td>
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Introduction

1-1 Background

Chronic kidney disease (CKD) describes abnormal kidney function and/or structure. It is common, frequently unrecognized and often exists together with other conditions (for example, cardiovascular disease and diabetes). When advanced, it also carries a higher risk of mortality. The risk of developing CKD increases with increasing age, and some conditions that coexist with CKD become more severe as kidney dysfunction advances. CKD can progress to established renal failure in a small but significant percentage of people (Jacobs DR et al. 2002).

1-2 Problem of the statement

1-2-1 worldwide

Chronic kidney disease (CKD) is a worldwide threat to public health, but the dimension of the problem is probably not fully appreciated. There are ~1.8 million people in the world who are alive simply because they have access to one form or another of renal replacement therapy. Ninety percent of those live in high-income countries, where the average gross income is in excess of US $10000 per capita. However, the prevalence rate of renal replacement therapy varies among countries particularly in the emerging world, and this is related to the capacity of the health system to provide such a costly treatment rather than a true difference in epidemiology of renal disease. Although data on the prevalence of pre-dialysis CKD in low- and middle-income countries are sparse, we would expect that there are at least comparable numbers of patients with CKD in poor countries as in developed nations. Some examples indicate that the overall prevalence of CKD is 21%, 10.6% and 11% in urban areas, respectively, of Moldova, Nepal [4] and China [5]. Data from India also suggest that in a developing country the prevalence rate of CKD could vary almost 5-fold between rural and city populations [6,7]. These observations imply that CKD would affect not only very many people in the developing world, but preferentially the poor within these countries who usually have no information about disease and risk factors and cannot have access to health care. (coresh, Astor 2003).
It is also increasingly recognized that the burden of CKD is not limited to its implications on demands for renal replacement therapy (dialysis or kidney transplantation), but has major impact on the overall population health. Indeed, patients with reduced kidney function portend a population not only at risk for progression of renal disease and development of end-stage renal disease (ESRD), but also at far greater likelihood for cardiovascular disease (CVD) [8]. However, human resources and financial support of medical programmes by local governments are very limited in many developing nations, which are major hurdles for effective interventions to control non-communicable chronic diseases (Fields LE, Burt VL, Cutler JA 2000)

1-2-2 In developing countries.

In developing countries that chronic kidney disease affects over 50 million people including 1 million currently receiving renal replacement therapies such as peritoneal dialysis, hemodialysis or renal transplant (Dirks et al., 2005). In the United States (US) the prevalence of renal disease is disproportionately high in African American and Hispanic population groups (Chiapella & Feldman, 1995). Diabetes is the most common comorbid primary condition which precedes endstage renal disease (ESRD). Projections of diabetes prevalence in the US suggest an increase of 165% by 2050 with the greatest increase in incidence among African Americans and persons older than age 75 (Boyle et al., 2001). Countries around the world are struggling to find cost effective interventions to slow the progression of chronic kidney disease (CKD) and reduce the incidence of end stage renal diseaserequiring dialysis and/or renal transplant therapy. Renal replacement therapy and dialysis are federally guaranteed entitlement benefits in the US as well as many other developed countries. Current estimates are that approximately 11% of the US population is affected by CKD (US Renal Data System, 2007). Of those with CKD, 1% progress to kidney failure which is treated only by dialysis or transplant. In 2003, 453,000 Americans required dialysis or transplantation. This is projected to increase to 651,000 by 2010. Expenditures related to renal replacement therapy account for 16.5% of Medicare spending. This is twice the amount spent just 10 years ago (Avron J, Bohn RL 2002).
1-2-3 In Sudan

A study of the clinical presentation and conceivable causes of chronic renal failure (CRF) in 61 Sudanese patients in Khartoum is presented. The clinical features involved almost all the systems, however, gastrointestinal and cardiovascular signs and symptoms predominated. The causes of chronic renal failure in Sudan and Sweden are also studied for comparison. The causes of CRF in Sudan are chronic glomerulonephritis, obstructive nephropathy (stone disease), hypertension and diabetes mellitus in that order. The main causes of CRF in Sweden are chronic glomerulonephritis, diabetes mellitus and chronic pyelonephritis. Of the 61 Sudanese patients 16 have kidney transplants, only one in Sudan, three patients are on regular hemodialysis, nine patients are on intermittent peritoneal dialysis, 16 are on conservative treatment and 17 died during the course of treatment.( Osman EM, AbboudOl, Danielson BG, 2006 )-

1-3 Justification and Rationale:

Renal failure is high indicator of countries health care as well as Renal failure effect in the economic status of the person and community that was observed that renal increase renal failure rates in many developing countries

1-4 Objectives:

1-4-1 General objective:

- To assess the patients' knowledge and attitude about chronic renal failure and it’s management at renal center in Omdurman teaching hospital, Khartoum state, Sudan, during the period of October 2012

1-4-2 Specific objectives:

- To assess the patients' knowledge regarding to the disease.
- To assess the patient s' compliance to the treatment and to the diet.
- To assess the patients 'attitude.
Literature review

2-1 Introduction:
The primary function of the kidney is to maintain a stable internal environment for optimal cell and tissue metabolism. The kidneys accomplish these life-sustaining tasks by balancing solute and water transport, excreting metabolic waste products, conserving nutrients, and regulating acids and bases. The kidney also has an endocrine function, secreting the hormones rennin, Erythropoietin, and 1,25-dihydroxyvitamin D₃ for regulation of blood pressure, erythrocyte production, and calcium metabolism, respectively. In times of severe fasting, the kidney also can synthesize glucose from amino acids, performing the process of gluconeogenesis. The formation of urine is achieved through the processes of filtration, reabsorption, and secretion by the glomeruli and tubules within the kidney. The bladder stores the urine that it receives from the kidney by way of the ureters. Urine is then removed from the body through the urethra. (Remuzzi G, Ruggenenti P, Perico N. Ann Intern Med. 2002; 136:604.-15 PubMed)

2-2 Anatomy of urinary system :
a. Kidneys: are paired organs located on the posterior abdominal wall outside the peritoneal cavity. They lie on either side of the vertebral column with their upper and lower poles extending from the twelfth thoracic to the third lumbar vertebrae. Each kidney is approximately
b. 11 cm long, 5 to 6 cm wide, and 3 to 4 cm thick. A tightly adhering capsule (the renal capsule) surrounds each kidney, and the kidney then is embedded in a mass of fat. The capsule and fatty layer are covered with a double layer of renal fascia, fibrous tissue that attaches the kidney to the posterior abdominal wall. The cushion of fat and the position of the kidney between the abdominal organs and muscles of the back protect it from trauma. The right kidney is slightly lower than the left; it is displaced downward by the overlying liver. A medial indentation (the hilum) contains the entry and exit for the renal blood vessels, nerves, lymphatic vessels, and ureter. The gross structure of the kidney can be identified when it is divided from top to bottom in a coronal plane. The major components are the outer renal cortex and the inner renal medulla. The cortex contains all the glomeruli and portions of the tubules. The medulla consists of a series of wedges, called renal pyramids, with an outer zone close to the cortex and an inner zone. Renal columns extend from the cortex down between the renal pyramids. The apexes of the pyramids project into a minor calyx (a cup-shaped cavity), which joins together to form a major
calyx. The major calyces join to form the renal pelvis, an extension of the upper end of the ureter. (Coresh J, Wei GL, et al. C 2001)
c. Nephron:
The nephron is the functional unit of the kidney. Approximately 1.2 million nephrons are contained in each kidney. The nephron is a tubular structure that consists of a tuft of capillaries termed the glomerulus, the site at which blood is filtered, and a renal tubule from which water and salts in the filtrate are reclaimed. The different structures of the epithelial cells lining various segments of the tubule facilitate the special functions of secretion and reabsorption. (Hsu CY, Chertow GM. Chronic renal confusion: insufficiency 2000)
i. Glomerulus: The glomerulus is a tuft of capillaries, the glomerular capillaries, that loop into a circular capsule, called Bowman capsule, like fingers pushed into bread dough. The wall of the glomerular capillary serves as a filtration membrane (the glomerular filtration membrane) and has three layers: (1) an inner capillary endothelium, (2) a middle basement membrane, and (3) an outer layer of capillary epithelium (also called podocytes or visceral epithelium). Each layer has unique structural properties that allow all components of the blood to filter through, with the exception of blood cells and plasma proteins with a molecular weight greater than 70,000. The glomerulus is supplied by the afferent arteriole and drained by the efferent arteriole. (K/DOQI clinical practice guidelines for chronic kidney disease 2002)
ii. Tubules: The proximal tubule continues from Bowman space and has an initial convoluted segment and then a straight segment that descends toward the medulla. The proximal tubular lumen consists of one layer of cuboidal cells with a surface layer of microvilli that increases reabsorptive surface area. The proximal tubule joins the loop of Henle, a hairpin loop composed of thick and thin portions of a descending segment that goes into the medulla. The tube then loops and becomes the thickening-ascending segment that extends toward the cortex. The thin segment is composed of thin squamous cell with no active transport function. The cells of the thick segment are cuboidal and actively transport several solutes. The distal tubule has straight and convoluted segments and extends to the collecting duct that then empties into a minor calyx. (Jacobs DR Jr, Murtaugh MA, Steffes M, Yu X, Roseman J, Goetz FC. Gender- and race-specific determination of albumin excretion rate using albumin-to-creatinine ratio in single, untimed urine specimens: the Coronary Artery Risk Development in Young Adults 2002)
d. Blood Vessels: The blood vessels of the kidney closely parallel nephron structure. The renal arteries arise as the fifth branches of the abdominal aorta. At the renal hilum, they divide into anterior and posterior branches and then subdivide into lobar arteries that supply blood to the lower, middle, and upper thirds of the kidney. The interlobar arteries are further subdivisions that travel down the renal columns and between the pyramids. At the cortical medullary junction, interlobar arteries branch into the arcuate arteries, which arch over the base of the pyramids and run parallel to the surface of the kidney. The interlobular arteries arise from the arcuate arteries and extend through the cortex toward the periphery and form the afferent glomerular arterioles.

e. Ureters: The urine formed by the nephrons flows from the distal tubules and collecting ducts through the renal papillae (projections of the ducts), and into the calyces and is collected in the renal pelvis. From the renal pelvis, urine is funneled into the ureters. Each adult ureter is approximately 30 cm long and is composed of long, intertwining muscle bundles. The lower ends of the ureters pass obliquely through the posterior aspect of the bladder wall. The close approximation of muscle cells permits the direct transmission of electrical stimulation, and the resulting peristaltic activity propels urine into the bladder. Peristaltic activity is affected by urine volume. When urine flow is slow, the contraction is segmented, with downward propulsion of urine. Increasing flow rates increase peristalsis. Peristalsis is maintained even when the ureter is denervated, so ureters can be transplanted. Contraction of the bladder during micturition (urination) compresses the lower end of the ureter, preventing reflux. (Gregg EW, Cheng YJ, Cadwell BL 2005)

f. Bladder and Urethra:
The bladder is a bag composed of a basket weave of smooth muscle fibers that forms the detrusor muscle and its smooth lining of transitional epithelium. As the bladder fills with urine, it distends and the layers of transitional epithelium slide past each other and become thinner as the volume of the bladder increases. The trigone is a smooth triangular area lying between the openings of the two ureters and the urethra. The position of the bladder varies with age and gender. In infants and young children, the bladder rises above the symphysis pubis, providing easy access for percutaneous aspiration. In adults, it lies in the true pelvis, in front of the rectum and in front of the uterus in women. Inferiorly, the bladder sits on the prostate in men and on the anterior vagina in women. The bladder has a profuse blood supply, accounting for the bleeding that readily occurs with trauma, surgery, or inflammation. The urethra extends from the inferior
side of the bladder to the outside of the body. Two muscles called sphincters control excretion of urine from the bladder through the urethra. A ring of smooth muscle forms the internal urethral sphincter at the junction of the urethra and bladder. The external urethral sphincter is composed of striated muscles and is under voluntary control. The entire urethra is lined with mucus-secreting glands. (Kinchen KS, , et al.. 2002 )

2-3 Physiology of urinary system :

a. Renal Blood Flow (RBF): The kidneys are highly vascular organs and usually receive 1000 to 1200 ml of blood per minute, or about 20% to 25% of the cardiac output. With a normal hematocrit of 45%, about 600 to 700 ml of blood flowing through the kidney per minute is plasma. From the renal plasma flow, 20% (approximately 120 to 140 ml/min) is filtered at the glomerulus and passes into Bowman capsule. The filtration of the plasma per unit of time is known as the glomerular filtration rate (GFR), and the GFR is directly related to the perfusion pressure in the glomerular capillaries. Blood flow to the kidneys is regulated by:

i. Autoregulation: a local mechanism within the kidney that tends to keep the rate of blood flow and GFR fairly constant over a range of arterial pressures between 80 and 180 mmHg.

ii. Neural regulation: the sympathetic nervous system innervates the kidney and regulates RBF related to systemic arterial pressure. When systemic pressure decreases, RBF decreases. This reduced blood flow reduces GFR and diminishes the excretion of sodium and water, promoting an increase in blood volume and thus an increase in systemic pressure.

iii. Hormonal regulation: Hormonal factors can alter the resistance of the renal vasculature by stimulating vasodilation or vasoconstriction. A major hormonal regulator of RBF is the renin-angiotensin system, which can increase systemic arterial pressure and change RBF(Hsu CY, Chertow GM, Curhan GC.. 2002 )

b. Production of Urine:

Urine is the fluid secreted from the blood by the kidneys. Normal urine is 95% water but also contains urea, sodium, chloride, creatinine, and other organic and inorganic substances in minute amounts. Urine is produced by:

i. Glomerular filtration: filtration of the blood through the epithelial walls of the glomerulus produces glomerular filtrate.
ii. Tubular reabsorption: a process where much of the glomerular filtrate passes out of the nephron tubule and returns to the blood. As much as 99% of material in the filtrate is returned to the blood.

iii. Tubular secretion: substances not removed from the blood during glomerular filtration are transported from the peritubular capillaries directly into the nephron tubule.

1. Ions removed from the blood by tubular secretion include: potassium, hydrogen, and ammonium. The secretion of hydrogen ions is important in maintaining blood pH.
2. Other molecules secreted include: food preservatives, pesticides, medications, and creatinine.
3. Marijuana, cocaine, heroin, and other drugs are also removed by tubular secretion, which makes it possible to perform urine drug testing. (Mokdad AH, Ford ES, Bowman BA. et al 2003)

**2-4 Causes of kidney failure**

Kidney failure can occur from an acute situation or from chronic problem. In acute renal failure, kidney function is lost rapidly and can occur from a variety of insults to the body. The list of causes is often categorized based on where the injury has occurred.

a). Prerenal causes are due to decreased blood supply to the kidney. Examples of prerenal causes are:

- Hypovolemia due to blood loss
- Dehydration from loss of body fluid (vomiting, diarrhea, sweating, fever)
- Poor intake of fluids
- Medication, for example, diuretics may cause excessive water loss.
- Loss of blood supply to the kidney due to obstruction of the renal artery or vein.

b). Renal causes (damage directly to the kidney itself) include:

- Sepsis: The body's immune system is overwhelmed from infection and causes inflammation and shutdown of the kidneys. This usually does not occur with urinary tract infections. (Levinsky NG. Specialist evaluation in chronic kidney disease 2002)
Medications:

Some medications are toxic to the kidney, including no steroidal anti-inflammatory drugs like ibuprofen and naproxen. Others are antibiotics like amino glycosides [gentamicin (Garamycin), tobramycin], lithium (Eskalith, Lithobid), iodine-containing medications such as those injected for radiology dye studies. (United States Renal Data System. 2000)

Rhabdomyolysis:

This is a situation in which there is significant muscle breakdown in the body, and the degeneration products of muscle fibers clog the filtering system of the kidneys. Often occurring because of trauma and crush injuries, it can also be caused by some medications used to treat high cholesterol.

Multiple Myeloma

Acute glomerulonephritis or inflammation of the glomeruli, the filtering system of the kidneys. Many diseases can cause this inflammation including systemic lupus erythematosus, Wegener's granulomatosis, and Good pasture syndrome.

C). Post renal causes are due to factors that affect outflow of the urine:

- Obstruction of the bladder or the ureters can cause back pressure when there is no place for the urine to go as the kidneys continue to work. When the pressure increases enough, the kidneys shut down.
- Prostatic hypertrophy or prostate cancer may block the urethra and prevents the bladder from emptying.
- Tumors in the abdomen that surround and obstruct the ureters.
- Kidney stones
- Chronic renal failure develops over months and years. The most common causes of chronic renal failure are related to:
  - Poorly controlled diabetes
  - Poorly controlled high blood pressure
  - Chronic glomerulonephritis
d). Less common causes:

- Polycystic Kidney Disease
- Reflux nephropathy
- Kidney stones
- Prostate disease.

2.4.1. Sign and symptoms of kidney failure

- In the beginning, kidney failure may be asymptomatic. As kidney function decreases, the symptoms are related to the inability to regulate water and electrolyte balances, to clear waste products from the body, and to promote red blood cell production. Lethargy, weakness, shortness of breath, and generalized swelling may occur. Unrecognized or untreated, life-threatening circumstances can develop. Metabolic acidosis, or increased acidity of the body due to the inability to manufacture bicarbonate, will alter enzyme and oxygen metabolism, causing organ failure. Inability to excrete potassium and rising potassium levels in the serum (hyperkalemia) is associated with fatal heart rhythm disturbances (arrhythmias). Rising urea levels in the blood (uremia) can affect the function of a variety of organs ranging from the brain (encephalopathy) with alteration of thinking, to inflammation of the heart lining (pericarditis), to decreased muscle function because of low calcium levels (hypocalcemia). Generalized weakness can be due to anemia, a decreased red blood cell count, because lower levels of erythropoietin do not adequately stimulate the bone marrow. A decrease in red cells equals a decrease in oxygen-carrying capacity of the blood, resulting in decreased oxygen delivery to cells for them to do work; therefore, the body tires quickly. As well, with less oxygen, cells more readily use anaerobic metabolism (an=without + aerobic=oxygen) leading to increased amounts of acid production that cannot be addressed by the already failing kidneys. As waste products build in the blood, loss of appetite, lethargy, and fatigue become apparent. This will progress to the point where mental function will decrease and coma may occur. Because the kidneys cannot address the rising acid load in the body, breathing becomes more rapid as the lungs try to buffer the acidity by blowing off carbon dioxide. Blood pressure may rise because of the excess fluid, and this fluid can be deposited in the lungs, causing congestive heart failure. (Profiles of General Demographic Characteristics: 2001)
2.4.2. Classification:

Renal failure

The terms renal insufficiency, renal failure, azotemia, and uremia are all associated with decreasing renal function. Often, they are used synonymously, although with some distinctions. Generally, renal insufficiency refers to a decline in renal function to about 25% of normal or a GFR of 25 to 30 ml/min. Levels of serum creatinine and urea are mildly elevated. Renal failure often refers to significant loss of renal function. When less than 10% of renal function remains, this is termed end-stage renal failure (ESRF). Renal failure may be acute and rapidly progressive, although the process may be reversible. Renal failure also can be chronic, progressing to ESRF over a period of months or years (USRDS 2006).

Uremia is a syndrome of renal failure and includes elevated blood urea and creatinine levels accompanied by fatigue, anorexia, nausea, vomiting, pruritus, and neurologic changes. Azotemia and uremia are sometimes incorrectly used interchangeably. Azotemia means increased serum urea levels and frequently increased creatinine levels as well. Renal insufficiency or renal failure causes azotemia. Uremia represents the numerous consequences related to renal failure, including retention of toxic wastes, deficiency states, and electrolyte disorders. Both azotemia and uremia indicate an accumulation of nitrogenous waste products in the blood, a common characteristic that explains the overlap in definitions of terms.

1. Acute Renal Failure:

Acute renal failure (ARF) is an abrupt reduction in renal function and plasma creatinine levels. Acute renal failure is usually associated with oliguria (urine output of less than 30 ml/hr or less than 400 ml/day), although urine output may be normal or increased. Most types of acute renal failure are reversible if diagnosed and treated early. Acute renal failure can be caused by different clinical conditions, severe hypotension including vascular obstruction, or severe glomerular disease; commonly it is classified as pre-renal, intra-renal, or post-renal. A combination of ischemic or hepatotoxic factors may produce acute renal failure. (Elixhauser A, Klemstine K, Steiner C, Bierman 2001.)
a. Pre-renal acute renal failure:
Pre-renal acute renal failure is caused by impaired renal blood flow. The GFR declines because of the decrease in filtration pressure. Poor perfusion can result from renal vasoconstriction, hypotension, hypovolemia, hemorrhage, or inadequate cardiac output. Acute pre-renal failure may occur when chronic renal failure exists if a sudden stress is imposed on already marginally functioning kidneys. Failure to restore blood volume or blood pressure may cause acute tubular necrosis or acute cortical necrosis.

b. Intra-renal acute renal failure:
Intra-renal acute renal failure may result from pre-renal acute renal failure (e.g., acute tubular necrosis or cortical necrosis) or many other diseases, including acute glomerulonephritis, malignant hypertension, dis-seminated intravascular coagulation, and renal vasculitis. Acute tubular necrosis (ATN) is the most common cause of acute renal failure. ATN caused by ischemia occurs most frequently after surgery (40% to 50% of cases), but ATN is produced by numerous antibiotics, but the aminoglycosides (neomycin, gentamicin, also associated with sepsis, obstetric complications, or severe burns Nephrotoxic ATN can be tobramycin) are the major culprits. Radiocontrast media (x-ray media) also may be nephrotoxic. Dehydration, advanced age, concurrent renal insufficiency, and diabetes mellitus tend to enhance nephrotoxicity from either aminoglycosides or radiocontrast media. Other substances such as excessive myoglobin (oxygentransporting substance in muscles), carbon tetrachloride, heavy metals (mercury, arsenic), or methoxyflurane anesthesia may promote renal failure. Necrosis caused by nephrotoxins is usually uniform and limited to the proximal tubules. Ischemic necrosis tends to be patchy and may be distributed along any part of the nephron.


c. Post-renal acute renal failure:
Post-renal acute renal failure usually occurs with urinary tract obstruction that affects the kidneys bilaterally (e.g., bladder outlet obstruction, prostatic hypertrophy, or bilateral ureteral obstruction). A pattern of several hours of anuria with flank pain followed by polyuria is a
characteristic finding. This type of renal failure can occur after diagnostic catheterization of the ureters, a procedure that may cause edema of the tubular lumen.

**Causes of acute renal failure:**

i. Toxic agents, e.g., carbon tetrachloride, methoxyflurane, sulfonamides, aminoglycoside antibiotics, amphotericin B, mercury bichloride, arsenic, diethylene glycol, and mushroom poisoning. X-ray contrast materials are hazardous in patients with dehydration, renal disease, diabetic nephropathy, liver failure, or multiple myeloma.

ii. Traumatic shock due to severe injury, surgical shock, or myocardial infarction, and ischemia associated with surgery on the abdominal aorta (vasomotor nephropathy).

iii. Tissue destruction due to crushing injury, rhabdomyolysis, burns, intravascular hemolysis (transurethral resection of the prostate, incompatible blood transfusion).

iv. Infectious diseases, e.g., leptospirosis, hemorrhagic fever, gram-negative bacteremia with shock, toxic shock syndrome, peritonitis.

v. Disseminated intravascular coagulation.

vi. Complications of pregnancy, e.g., bilateral cortical necrosis.

vii. Immunologic mechanisms induced by methicillin, penicillin, phenytoin, and other drugs.

(Chobanian 2003)

**Clinical Manifestations**

i. Sudden onset of oliguria; urine volume 20-200 mL/day. (Oliguria may not occur).

ii. Proteinuria and hematuria; specific gravity of 1.010 -1.016.

iii. Anorexia, nausea and vomiting, lethargy, elevation of blood pressure. Signs of uremia.

iv. Progressive increase in serum urea nitrogen, creatinine, potassium, phosphate, sulfate; decrease in sodium, calcium, bicarbonate.

v. Spontaneous recovery in a few days to 6 weeks.

**2. Chronic Renal Failure:**

The kidney has many important regulatory functions, including body fluid volume, solute concentration and dilution, acid-base balance, excretion of waste products, and secretion of hormones that regulate red blood cell production, blood pressure, and calcium metabolism. Progressive and irreversible loss of renal function (chronic renal failure), regardless of the cause, affects these vital processes with changes manifest throughout all organ systems. The kidneys,
however, exhibit remarkable adaptive abilities, and symptomatic changes resulting from increased creatinine, urea, potas-sium, and alterations in salt and water balance usually do not become apparent until the renal function declines to less than 25% of normal.


2.4.3. Renal Parenchymal Disease

Interstitial Nephritis

a. Pathology: Diffuse inflammation of the interstitial tissue (non-glomerular) tissue of the kidney.

b. Etiology: May be due to systemic infections from bacteria, viruses, and spirochetes and sensitivity to drugs, including antibiotics, diuretics, non-steroidal anti-inflammatory agents, and others. Some patients will show other signs of hypersensitivity such as rash, arthralgia, fever, and eosinophilia.

c. Signs and Symptoms:
   i. Hematuria, Proteinuria, Enlargement of the kidneys are commonly demonstrable, Occasionally, acute renal failure may occur and Recovery may be complete

Cystic Disease of the Kidney

a. Polycystic Kidneys
   i. Pathology: Polycystic kidney disease is familial (autosomal dominant) and often involves not only the kidney but the liver and pancreas as well. The formation of cysts in the cortex of the kidney is thought to result from failure of union of the collecting tubules and convoluted tubules of some nephrons. New cysts do not form, but those present enlarge and, by pressure, cause destruction of adjacent tissue. Cysts may be found in the liver and pancreas. The incidence of cerebral vessel (“berry”) aneurysms is higher than normal.


   ii. Signs and Symptoms: Cases of polycystic disease are discovered during the investigation of hypertension, by diagnostic study in patients presenting with pyelonephritis or hematuria, or by investigating the families of patients with polycystic disease. At times, flank pain due to hemorrhage into a cyst will call attention to a kidney disorder. Otherwise, the symptoms and signs are those commonly seen in hypertension or renal insufficiency. On physical examination, the enlarged, irregular kidneys are easily palpable
b. Medullary Cystic Disease: Medullary cystic disease is a familial disease (either autosomal dominant or recessive) that may become symptomatic during adolescence. Anemia is usually the initial manifestation, but azotemia, acidosis, and hyperphosphatemia soon become evident. Hypertension may develop. The urine is not remarkable, although there is often an inability to produce concentrated urine. Many small cysts are scattered through the renal medulla. Renal transplantation is indicated by the usual criteria for the operation.

i. Medullary Sponge Kidney: Sponge kidney is asymptomatic and is discovered by the characteristic appearance of the urogram. Enlargement of the papillae and calices and small cavities within the pyramids are demonstrated by the contrast media in the excretory urogram. Many small calculi often occupy the cysts, and infection may be troublesome. Life expectancy is not affected, and only symptomatic therapy for ureteral impaction of a stone or for infection is required.

Infections of the Urinary Tract

The term urinary tract infection denotes a wide variety of clinical entities in which the common denominator is the presence of a significantly large number of microorganisms in any portion of the urinary tract. Microorganisms may be evident only in the urine (bactericidal), or there may be evidence of infection of an organ, e.g., urethritis, prostatitis, cystitis, pyelonephritis. At any given time, any one of these organs may be asymptomatic or symptomatic. Infection in any part of the urinary tract may spread to any other part of the tract. Symptomatic urinary tract infection may be acute or chronic. The term relapse implies recurrence of infection with the same organism; the term re-infection implies infection with another organism.

b. Pathogenesis: Urine secreted by normal kidneys is sterile until it reaches the distal urethra.

Bacteria can reach the urinary tract by the ascending route or by hematogenous spread. The latter occurs during bacteremia (e.g., with staphylococci) and results in abscess formation in the cortex or the perirenal fat. Far commoner is ascending infection, where bacteria are introduced into the urethra (from fecal flora on the perineum or the vaginal vestibule, or by instrumentation) and travel up the urinary tract to reach the bladder, ureter, or renal pelvis. The most important factor in aiding or perpetuating ascending infection is anatomic or functional obstruction to free urine flow. Free flow, large urine volume, complete emptying of the bladder, and acid pH are important antibacterial defenses.
c. Pathology: Acute urinary tract infection shows inflammation of any part of the tract and sometimes intense hyperemia or even bleeding of the mucous membranes. The prominent lesion in the kidney is acute inflammation of the interstitial tissue, which may progress to frank suppuration and patchy necrosis. Papillary necrosis (e.g., in diabetics) may lead to slough of papillae and ureteral obstruction. Recurrent urinary tract infection may cause only minimal changes or progressively more severe scarring in any part of the tract. Chronic pyelonephritis may lead to widespread fibrosis and scarring of functional cortical and medullary tissue, resulting in renal insufficiency: it appears unlikely that repeated urinary tract infection causes renal insufficiency unless there is concomitant obstruction. Chronic interstitial nephritis may result from bacterial infection or from other causes (e.g., hypersensitivity, vasculitis, use of analgesics). (United States Renal Data System. 2000)

Acute Urinary Tract Infection

i. Lower Urinary Tract (Urethritis, Cystitis, Pyelonephritis): Manifestations include burning pain on urination, often with turbid, foul-smelling, or dark urine, frequency, and suprapubic or lower abdominal discomfort. There are usually no positive physical findings unless the upper tract is involved also.

ii. Upper Urinary Tract: (Pyelonephritis)

Manifestations include: headache, malaise, vomiting, chills and fever, costovertebral angle pain and tenderness, and abdominal pain. The absence of upper tract signs does not exclude bacterial invasion of the upper tract, however. Laboratory findings were bacteriuria and pyuria.

b. Chronic Urinary Tract Infection (Cystitis, Pyelonephritis): Chronic or recurrent episodes of urinary tract infection usually produce no permanent harm unless obstruction is present. In these patients, chronic bacterial pyelonephritis may progress to inflammation of interstitial tissue, scarring, atrophy, and, rarely, progressive renal failure. In most patients with these pathologic findings, “chronic pyelonephritis” is in fact not caused by infection but instead represents interstitial nephritis of immunologic or toxic cause. Occasionally, chronic infection is due to a unilateral structural abnormality (e.g., ureteral stricture), and nephrectomy may be curative. With bilateral nephritis, chronic suppression of infection may stabilize renal function. Some women have chronic bacteremia, which is asymptomatic; in the absence of anatomic abnormalities, the prognosis for preservation of renal function appears to be good. (Gregg EW, Cheng YJ, Cadwell BL. 2005)
i. Signs and Symptoms
1. Recurrent episodes of lower or upper tract involvement.
2. Absence of symptoms or signs referable to the urinary tract, but persistent asymptomatic bacteriuria.
3. Obstruction or other anatomic abnormality in the urinary tract is consistently found in men, occasionally in women.
4. Impairment of renal function rare unless obstruction is present.

ii. Laboratory Findings:
1. Elevated serum BUN and creatinine, Anemia, Bacteriurimayor may not be present.

f. Prostatitis: Bacteria may reach the prostate from the bloodstream or from the urethra. Prostatitis is thus commonly associated with urethritis, or with active bacterial infection of the lower urinary tract.

i. Signs and Symptoms: These include perineal pain, fever, dysuria, frequency, and urethral discharge. In acute prostatitis, the prostate feels enlarged, boggy, and very tender; fluctuation occurs only if an abscess has formed. Even gentle palpation of the prostate results in expression of copious purulent discharge. In chronic prostatitis, there may be dull lumbo-sacral and perineal pain, mild dysuria and frequency, and scanty urethral discharge. Palpation reveals a symmetrically enlarged, boggy, and slightly tender prostate.

3. Urinary Stones
a. Nephrocalcinosis: Urinary stones and calcification in the kidney may be associated with metabolic disease; may be secondary to infection in the urinary tract; may occur in sponge kidney, tuberculosis of the kidney, or papillary necrosis; or may be idiopathic. The incidence of urinary tract calculus is higher in men.

i. Pathology: Chronic hypercalciuria and hyperphosphaturia may result in precipitation of calcium salts in the renal parenchyma (nephrocalcinosis). The commonest causes are hyperparathyroidism, hypervitaminosis D (particularly with associated high calcium intake), and excess calcium and alkali intake. Chronic interstitial nephritis predisposes to nephrocalcinosis. Other causes include acute osteoporosis following immobilization, sarcoidosis, renal tubular acidosis, the de Toni-Fanconi syndrome, and destruction of bone by metastatic carcinoma.
ii. Signs and Symptoms: The symptoms, signs, and laboratory findings are those of the primary disease. The diagnosis is usually established by x-ray demonstration of calcium deposits in the kidney, which appear as minute calcific densities with linear streaks in the region of the renal papillae. True renal stones may be present as well in these patients. (Sarnak MJ, Levey AS. Cardiovascular disease and chronic renal disease: a new paradigm. Am J Kidney Dis. 2000)

b. Renal Stone: The location and size of the stone and the presence or absence of obstruction determine the changes that occur in the kidney and caliceal system. The pathologic changes may be modified by ischemia due to pressure or by infection.

i. Etiologies:
Excessive excretion of relatively insoluble urinary constituents of Calcium Oxalate Uric acid
2. Physical changes in urine Increased concentration of urine solute as a consequence of low intake of fluid and low urine volume. Changes in urine pH
3. Nucleus (nidus) for stone formation
   a. Uricosuria—Crystals of uric acid or sodium hydrogen urate may initiate precipitation of calcium oxalate from solution.
   
   a. Bits of necrotic tissue, blood clots, and clumps of bacteria, particularly in the presence of stasis or infection, may serve as a nucleus for stone formation

4. Congenital or acquired deformities of the kidneys as Sponge kidney, Horseshoe kidney and Local caliceal obstruction or defect.
   ii. Signs and Symptoms include:-
   Often asymptomatic.
   
   Symptoms of obstruction of calix or ureteropelvic junction, with flank pain and colic, Nausea, vomiting, abdominal distention, Hematuria and Chills and fever and bladder irritability if infection is present.

c. Ureteral Stone: Ureteral stones are formed in the kidney but produce symptoms as they pass down the ureter.

   i. Signs and Symptoms:
   1. Obstruction of ureter produces severe colic with radiation of pain to regions determined by the position of the stone in the ureter.
   2. Gastrointestinal symptoms common.
3. Urine usually contains fresh red cells.
4. May be asymptomatic.
5. Exacerbations of infection when obstruction occurs.

(Shlipak MG, Fried LF, Crump C, Bleyer AJ, Manolio TA, Tracy RP, et al.. Cardiovascular disease risk status in elderly persons with renal insufficiency 2002)

Bladder Stone:
Vesical stones occur most commonly when there is residual urine infected with urea-splitting organisms (e.g. Proteus, staphylococci). Thus, bladder stones are associated with urinary stasis due to bladder neck or urethral obstruction, diverticula, neurogenic bladder, and cystocele. Foreign bodies in the bladder act as foci for stone formation. Ulceration and bladder inflammation predispose to stone formation. Most vesical stones are composed of calcium phosphate, calcium oxalate, or magnesium ammonium phosphate. Uric acid stones are common in the presence of an enlarged prostate and uninfected urine.

i. Signs and Symptoms include
   Bladder irritability, with dysuria, urgency, and frequency, Interruption of urinary stream as stone occludes urethra, Hematuria and Benign prostatic hypertrophy is occasionally present in men.

5. Obstructive Uropathy: Obstruction of the urinary tract can result in serious damage to the kidneys; early detection and treatment are required to prevent irreversible function and anatomic damage.
   The site and degree of obstruction, the duration of obstruction, and the complication of urinary tract infection determine the presenting manifestations

a. Pathology: Complete obstruction to the flow of urine produces increase in pressure in the ureters and in the renal pelvis, which then become dilated. Renal papillae become flattened, the renal tubules dilate, and glomerular filtration is impeded. Functional impairment of tubule function affects the excretion of solute, the reabsorption of sodium, and the secretion of hydrogen ion. Renal blood flow is reduced. Destruction of the kidney results within a few weeks. Partial obstruction produces lesser impairment of renal function.

b. Etiology: Obstructive uropathy is the result of:
   i. Congenital anatomic abnormalities (eg, ureteropelvic, ureterovesical, or urethral stricture)
   ii. Stone, tumor, or clot that obstructs a ureter or the bladder neck
iii. Extrinsic tumors, bands, or fibrosis
iv. Neuromuscular disorder related to the spinal cord or peripheral nerve lesions
c. Signs and Symptoms: The site of obstruction and rapidity of onset determine the presentation.
   Chronic or low-grade obstruction is usually asymptomatic. Acute and complete obstruction of a
   ureter will produce pain in the flank or groin associated with distention of the renal capsule or
   ureteral colic. Acute obstruction of the urethra by an enlarged prostate, postoperative bladder
   dysfunction, or stone will produce painful distention of the bladder. Chronic urethral obstruction
   may result in a distended bladder with “overflow” dribbling. If a neurologic lesion is the cause of
   bladder dysfunction, there may be overflow dribbling from a distended bladder, involuntary
   voiding, and frequency with incomplete emptying of the bladder.
   (Manjunath G, Tighiouart H, Coresh J, Macleod B, Salem DN, Griffith JL, et al..  Level of
   kidney function as a risk factor for cardiovascular outcomes in the elderly. 2003)
6. Testicular Disease
a. Epididymitis
   i. Pathology: Acute epididymitis is caused by bacterial infection ascending from the urethra or
   prostate. In older men, it usually follows urinary tract obstruction and infection or
   instrumentation of the lower genitourinary tract
      ii. Signs and Symptoms: Sudden pain in the scrotum, rapid unilateral scrotal enlargement, and
   marked tenderness of the testes, spermatic cord, and groin are the characteristic manifestations.
   Secondary orchitis with a swollen, painful testicle may occur. Elevation of the scrotum provides
   some relief.
   b. Orchitis: Acute orchitis is usually due to mumps and occurs during the years just following
   adolescence. It is most often unilateral but may be bilateral. Mumps may produce acute
   oophoritis as well. Chronic orchitis may be due to syphilis, tuberculosis, leprosy, filariasis, and
   schistosomiasis. Destruction of the test is usually leaves some hormonal cell function.
   c. Testicular Torsion: Testicular torsion (torsion of the spermatic cord) is most common in
   adolescent males and young men under age 25. An anomaly of the tunica vaginalis or of the
   relationship of the epididymis to the testis is usually present. The characteristic presentation is
   with a sudden onset of unabating pain in the scrotum, groin, or lower abdomen, made worse by
   elevation of the scrotum. The testis is swollen, tender, and retracted. Testicular torsion must be
differentiated from epididymitis, orchitis, and trauma to the testis. Treatment consists of immediate surgery to remove the infarcted testis. Orchiopexy of the other testis is desirable because of the high incidence of the bilateral anatomic abnormality associated with torsion (Aronoff GR, Berns JS, Brier ME, Golper TA, Morrison G, Singer I, et al. 2002.)

7. Tumors of the Genitourinary Tract:-

a. Adenocarcinoma of the Kidney (Renal cell carcinoma, Hypernephroma)
   i. Pathology: The commonest malignant tumor of the kidney is adenocarcinoma, which occurs more frequently in men. It rarely occurs before age 35 and more commonly after age 50. This tumor metastasizes early to the lungs, liver, and long bones. Adenocarcinoma of the kidney apparently arises from renal tubule cells or adenomas. It invades blood vessels early. On microscopic examination, the cells resemble renal tubule cells arranged in cords and varying patterns.
   ii. Signs and Symptoms include:-
      Gross hematuria with or without flank pain, Fever and Enlarged kidney may be palpable
b. Tumors of the Bladder
   i. Pathology: Bladder tumors are the second most common urinary tract tumors. At least 75% of bladder tumors occur in men over age 50. Tumors usually arise at the base of the bladder and involve ureteral orifices and the bladder neck. The common tumor is transitional cell carcinoma, which is often of low-grade malignancy; epidermoid tumors, adenocarcinomas, and sarcomas are rare. Metastases involve regional lymph nodes, bone, liver, and lungs
   ii. Signs and Symptoms include:-
      Hematuria, gross or microscopic, Malignant cells by urine cytology, Suprapubic pain and bladder symptoms associated with infection and Visualization of tumor at cystoscopy.

c. Benign Prostatic Hyperplasia (BPH)
   i. Pathology: Hyperplasia of the prostatic lateral and subcervical lobes that are invaded by periurethral glands results in enlargement of the prostate and urethral obstruction.
   ii. Signs and Symptoms as:-
      Prostatism: hesitancy and straining to initiate micturition, reduced force and caliber of the urinary stream, nocturia, Acute urinary retention, Enlarged prostate and Uremia follows prolonged obstruction
d. Carcinoma of the Prostate

i. Pathology: Cancer of the prostate is rare before age 60. It metastasizes early to the bones of the pelvis and locally may produce urethral obstruction with subsequent renal damage. The growth of the tumor is increased by androgens and inhibited by estrogens. The prostatic tissue is rich in acid phosphatase, and when cancer has extended beyond the prostate to the periprostatic tissue or to bone, the serum acid phosphatase is increased. The serum acid phosphatase concentration thus provides a good index of extension and growth of the tumor. (Mokdad AH, Ford ES, Bowman BA 2003)

ii. Signs and Symptoms as:-
Prostatism, Hard consistency of the prostate, Metastases to bone produce pain, particularly in the low back and Elevated serum acid phosphatase in 85% of patients with extension of the cancer beyond the prostatic capsule.

2.4.4. Treatment for kidney failure

Prevention is always the goal with kidney failure. Chronic disease such as hypertension and diabetes are devastating because of the damage that they can do to kidneys and other organs. Lifelong diligence is important in keeping blood sugar and blood pressure within normal limits. Specific treatments are dependent upon the underlying diseases. Once kidney failure is present, the goal is to prevent further deterioration of renal function. If ignored, the kidneys will progress to complete failure, but if underlying illnesses are addressed and treated aggressively, kidney function can be preserved, though not always improved.


a. Diet
Diet is an important consideration for those with impaired kidney function. Consultation with a dietician may be helpful to understand what foods may or may not be appropriate. Since the kidneys cannot easily remove excess water, salt, or potassium, they may need to be consumed in limited quantities. Foods high in potassium include bananas, apricots. Phosphorus is a forgotten chemical that is associated with calcium metabolism and may be elevated in kidney failure. Too much phosphorus can leech calcium from the bones and cause
osteoporosis and fractures. Foods with high phosphorus content include milk, cheese, nuts, and cola drinks (Wendy Bazilian, DrPH, MA, RD • 2001 American Specialty Health, Inc.)

b. Medications

  Medications may be used to help control some of the issues associated with kidney failure.

- Phosphorus-lowering medications [calcium carbonate (Caltrate), calcitriol (Rocaltrol), sevelamer (Renagel)]
- Red blood cell production stimulation [erythropoietin, darbepoetin (Aranesp)]
- Red blood cell production (iron supplements)
- Blood pressure medications
- Vitamins

1. Once the kidneys fail completely, the treatment options are limited to dialysis or kidney replacement by transplantation.

  c. Dialysis

  Dialysis cleanses the body of waste products in the body by use of filter system. There are two types of dialysis.

  a. Hemodialysis

  Hemodialysis uses a machine filter called a dialyzer or artificial kidney to remove excess water and salt, to balance the other electrolytes in the body, and to remove waste products of metabolism. Blood flows through tubing into the machine, where it passes next to a filter membrane. A specialized chemical solution (dialysate) flows on the other side of the membrane. The dialysate is formulated to draw impurities from the blood through the filter membrane. Blood and dialysate never touch in the artificial kidney machine.

  For this type of dialysis, access to the blood vessels needs to be surgically created so that large amounts of blood can flow into the machine and back to the body. Surgeons can build a fistula, a connection between a large artery and vein in the body, usually in the arm, that causes a large amount of blood flow into the vein. This makes the vein larger and its walls thicker so that it can tolerate repeated needle sticks to attach tubing from the body to the machine. Since it takes many weeks for a fistula to mature enough to be used, significant planning is required if hemodialysis is to be considered as an option. (Remuzzi G, Schieppati A, Ruggenenti P. Clinical practice. Nephropathy in patients with type 2 diabetes. N Engl 2002)

  If the kidney failure happens acutely and there is no time to build a fistula, special catheters may be inserted into the larger blood vessels of the arm, leg, or chest. These catheters may be left in place for up to three weeks. In some diseases, the need for dialysis will be temporary, but if the expectation is that dialysis will continue for a prolonged period of time, these catheters act as a bridge until a fistula can be planned, placed, and matured.

  Dialysis treatments normally occur three times a week and last a few hours at a time. Most commonly, patients travel to an outpatient center to have dialysis, but home dialysis therapy is becoming an option for some.
b. Peritoneal dialysis
Peritoneal dialysis uses the lining of the abdominal cavity as the dialysis filter to rid the body of waste and to balance electrolyte levels. A catheter is placed in the abdominal cavity through the abdominal wall by a surgeon and is expected to remain there for the long-term. The dialysis solution is then dripped in through the catheter and left in the abdominal cavity for a few hours and then is drained out. In that time, waste products leech from the blood normally flowing through the lining of the abdomen (peritoneum).
There are benefits and complications for each type of dialysis. Not every patient can choose which type he or she would prefer. The treatment decision depends on the patient's illness and their past medical history along with other issues. Usually, the nephrologist will have a long discussion with the patient and family to decide what will be the best option available (Wikipedia 2010)

2.5. Prevention of kidney failure

Some common ways to lower the risk of developing kidney failure

1. DO NOT use any prescription medicines, over-the-counter medicines, herbal or nutrition supplements without talking to the doctor.
2. Take the medicines for diabetes and high blood pressure regularly, and follow the doctor's instructions.
3. Let the doctor know about any reactions or allergies to medicines.
4. Early diagnosis and management of renal or urinary problems.

(McClellan W 2002)

Previous Studies:

Poor nutritional status of haemodialysis patients is the result of several interrelated factors. Apart from the catabolic effect of dialysis, nutrient loss in dialysis and uraemic toxicity, several comorbid conditions may also contribute to malnutrition, including chronic infection and superimposed diseases that result in anorexia and inadequate food intake. It was also observed from the present study and that of Afshar et al. [9] that many patients were suffering from symptoms related to malnutrition such as fatigue and malaise, headache, weight loss, muscle wasting, frequent infections, impaired wound healing and bone troubles. This finding can be compared with Basaleem et al.’s study, where all the 50 study patients were suffering of bone pains and arthralgia. Moe et al. also reported that renal osteodystrophy was common in ESRD patients and related to disturbance in bone
Proper nutrition may help to reverse the wasting syndrome in dialysis patients with kidney disease on dialysis. This intervention study aimed to identify malnutrition problems and assess the effect of dietary counselling on improvement of health status of end-stage renal disease patients subjected to haemodialysis. Pre-intervention data were collected from 41 patients attending El Haram dialysis centre, Giza, Egypt; 97.5% of the patients were considered mildly to moderately malnourished and multiple malnutrition problems were detected (protein–energy malnutrition, hypocalcaemia, and anaemia and hyperphosphataemia). Nutritional counseling sessions resulted in statistically significant post-intervention improvements in Karnofsky performance scale scores, malnutrition inflammation scores and nutritional knowledge of the patients. Providing one-to-one nutrition counseling could be linked to improvements in the patients’ nutritional knowledge and practices and to their health status and performance in activities of daily life.
Materials and methods

3-1 The study design:

This descriptive study was conducted at Hemodialysis units in Omdurman teaching hospital at assessing the patients’ knowledge and attitude about chronic renal failure and its management during the period of the study.

3-2 The study area:

The study was conducted in hemodialysis unit in Omdurman teaching hospital.

Omdurman is the largest city in Sudan and Khartoum state, lying on the western banks of the river Nile opposite the capital Khartoum (capital of Sudan).

Omdurman has a population of about 2,395,159 (2008).

Omdurman teaching hospital includes 3 departments (surgery-medicine–pediatrics) all managed by medical and paramedical personal. the capacity of this about 350 beds which are almost fully occupied throughout the year. The hemodialysis unit follow to medicine department which includes 3 units led by specialists (see table 3-1) statistical department of hemodialysis units teaching hospital 2012) distribution of beds, patients, machines and words.

Table (1) distribution of beds, patients, machines and words

<table>
<thead>
<tr>
<th>No. of word</th>
<th>No. of beds</th>
<th>No. of patients per day</th>
<th>No. of machines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult 1</td>
<td>16</td>
<td>64</td>
<td>18</td>
</tr>
<tr>
<td>Adult 2</td>
<td>16</td>
<td>64</td>
<td>18</td>
</tr>
<tr>
<td>Pediatric</td>
<td>12</td>
<td>48</td>
<td>14</td>
</tr>
</tbody>
</table>

Note

In the any word 2 beds for HBV positive ad 1 bed for HCV positive and others beds for negative patients. all the machines works for four shifts even the overnight.

They are 2 machines stand bay (one for emergency patient and anther for disfunctioning or stopped machine)
Note
The hemodialysis for patients twice per week just due to low socio-economic status.

The nurses staff changes every 3 days (total number is 56)

3.3 / Study Population

100 of patient complain of chronic Renal failure at hemodialysis unit in Omdurman Teaching Hospital during the period of October 2012 to September 2013.

3.3.1 Inclusion criteria:

All patients in hemodialysis unit in Omdurman teaching hospital during the period of study.

3.4 / Sample Size

The study sample size consisted of 100 patients' who consider all patients in renal centre, in Omdurman Teaching Hospital during the period of the study from October, 2012 to September 2013.

3.5 / Sample Technique

Permission were taken from the hemodialysis unit to collect ed the data.

Pilot study was done on 10 patient to modify the questionnaire.

Explain was done to each patient about the study and the questionnaire.

The research asked patient to complete the questionnaire.

3.6 / Data collection tools

One tool was used to collect study data which was interview questionnaire sheet. Consist of sociodemographic data about the subject and their knowledge about their illness and its management.

3.7 / Data Analysis

For the purpose of this study that data were collected processed and transferred to computer coding. The descriptive analysis was adopted which includes percentage, table, figures. Using Statistical package of social sciences (SPSS) programme was applied to determine the relationship between independent variable and dependent variable.
4.1 Results

Figure (1)  Distribution of the study sample according to their sex

From the study the men is more affected of chronic renal failure(62%) than women(38%).
Figure (2) Distribution of study sample according to their age

The age from 45-55 years more affected of chronic renal failure by 28%.
Figure (3) Distribution of the study sample according to the work

Male patients were non working so the renal failure defect the work and economic of the person and community by 40%.
<table>
<thead>
<tr>
<th>Educational Level</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illiteracy</td>
<td>13</td>
<td>13%</td>
</tr>
<tr>
<td>Write and read</td>
<td>6</td>
<td>6%</td>
</tr>
<tr>
<td>Primary</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Intermediate</td>
<td>19</td>
<td>19%</td>
</tr>
<tr>
<td>High secondary</td>
<td>27</td>
<td>27%</td>
</tr>
<tr>
<td>University</td>
<td>21</td>
<td>21%</td>
</tr>
<tr>
<td>Post graduate</td>
<td>3</td>
<td>3%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Most of the patients is at 27% high secondary school so their knowledge is not enough.
Figure (4) onset of chronic renal failure

54% of the patients developed chronic renal failure from 1-5 years.
Figure (5) history of the disease

67% of the patients have family history of chronic renal failure.
Table (3) knowledge of patient regarding chronic renal failure

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>I know all</td>
<td>28</td>
<td>28%</td>
</tr>
<tr>
<td>I know few</td>
<td>30</td>
<td>30%</td>
</tr>
<tr>
<td>I don’t know</td>
<td>42</td>
<td>42%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

42% of the patients’ don’t known about chronic renal failure.
Table (4) The patient knowledge about routine investigation that requested for regularly

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>All the time</td>
<td>66</td>
</tr>
<tr>
<td>Sometimes</td>
<td>32</td>
</tr>
<tr>
<td>Rarely</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
</tr>
</tbody>
</table>

66% of the patients' do the routine investigation regularly
Figure (6) Number of hemodialysis session for the patient

85% of patients do the hemodialysis session twice per week.
Table (5) distribution of regular follow up

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63</td>
<td>63%</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

63% of the patients’ on regular
Table (6) the patient regarding the medication efficacy on his health

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>89</td>
<td>89%</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>11%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

89% of the patients’ approve that the medication improve his health.
Figure (7) knowledge of the patient regarding to their treatment

55% of the patients’ take treatment in the time regularly.
Table (7) distribution of medication, diet control and feeling of outcome of diet control

distribution of medication

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>66</td>
<td>66%</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>34%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

distribution, diet control

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>53%</td>
</tr>
<tr>
<td>No</td>
<td>47</td>
<td>47%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100%</td>
</tr>
</tbody>
</table>

Distribution feeling of outcome of diet control

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<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>66</td>
<td>66%</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>34%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Most of the patient have side effect from medication and diet control.
Table (8) distribution of patient feeling about diet control boring and type of food allowed

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>66</td>
<td>66%</td>
</tr>
<tr>
<td>No</td>
<td>34</td>
<td>34%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

66% of the patients’ feel that diet control bored them
<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>28</td>
<td>28%</td>
</tr>
<tr>
<td>No</td>
<td>66</td>
<td>66%</td>
</tr>
<tr>
<td>I know few</td>
<td>6</td>
<td>6%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Most patient diet not know allowed diet and program of type of food.
Figure (8) distribution amount of protein allowed
58% of the patients’ did not know how much protein they should take
Figure (9) follow up

55% of the patients’do what the doctor say.
Table (10) distribution of negative impact on the patient's comfortable and health education from the nursing staff

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>80</td>
<td>80%</td>
</tr>
<tr>
<td>No</td>
<td>20</td>
<td>20%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63</td>
<td>63%</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62</td>
<td>62%</td>
</tr>
<tr>
<td>No</td>
<td>38</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Most of the patient have negative impact and have health education from the nursing staff.
Table (11) distribution of patient fatigue and tiredness after hemodialysis and trend nursing staff

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>63</td>
<td>63%</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>37%</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

86% of the patients said that have trend nursing staff.
4.2. Discussion

Chronic kidney disease (CKD) describes abnormal kidney function and/or structure. It is common, frequently unrecognised and often exists together with other conditions (for example, cardiovascular disease and diabetes). When advanced, it also carries a higher risk of mortality. The risk of developing CKD increases with increasing age, and some conditions that coexist with CKD become more severe as kidney dysfunction advances. CKD can progress to established renal failure in a small but significant percentage of people.

The study aims to know the patients’ awareness about his illness and the ways of treatment in Omdurman Teaching Hospital.

From the study the researcher found that men are affected more than women (62%) in figure (1). This is agreed with the study done in Canada (August 2012) which revealed that males are affected more than females. The same result were obtained from studies done in Iraq (source: American society of Nephrology, News release, August 2012).

Regarding Age, the study showed that chronic renal failure is more common at the age (45-55) figure (2). It is also agreed with a study done in Brazil 2007 that chronic renal failure was found more common at the age (50-59 years) indicating that chronic renal failure is more common with increasing age, this study done by Garg 2004.

The study showed that marital status and occupational status has no influence on chronic renal failure in figure (3,4).

Most of the patients in the study group were of low economic status (52%) and also they were of moderate education level in table (2).

The duration of chronic renal failure among patient in the study group was between 1-5 years in figure (4).

The majority 67% of them have family history of chronic renal failure figure (5). The study group have no enough information about their illness and 42% of patient in Option of treatment table (3).
All of the patient in the study were on regular hemodialysis twice per week figure(6).

63% were on regular follow up table(6) and 67% were compliant with their medication table (5).

Most of them 66% suffer from side effect of the medication e.g. nausea, vomiting.

Half of the patient have good diet control 66% of those agreed that diet control is useful, although they think that food items are limited and it is agreed with study done by Wendy Bazillian, Dr pH, MA, 2001 American Specialty Health, table (8, 9, 10).

50% of the patient have no enough information regarding how much protein is allowed

The study showed that 80% of the patient have negative impact of chronic renal failure on their life.

Also 63% of the patient feel uncomfortable from the long duration of treatment table (10).

62% of the patient in the study group received health education from the medical staff table (11).
Conclusion and Recommendations

5-1 Conclusion:

Based on the result the research concluded that there were adequate knowledge regarding patient.

Attitude it was observed that there was positive or negative patient attitude to words their illness and management.
5-2 Recommendations:

Based on the result the research Recommended the following program:

- Health education about causes, signs and symptoms, diet, prevention of chronic renal failure for the patient and community by comprehensive workshops, Mass Media by move qualified head team members.
- Treatment of chronic renal failure should be available and high quality care should be available. (for government)
- Rehabilitation of the patient so as to accept the disease or new life style.
18. McClellan W. As to diseases, make a habit of two things –to help, or at least do no harm. J Am SocNephrol. 2002
27. Wikipedia 2010
بسم الله الرحمن الرحيم

استبيان عن معلومات واتجاهات مريض الفشل الكلوي عن مرضه وعلاجه بوحدة الغسيل الديمو بمستشفى
أم درمان التعليمي - ولاية الخرطوم - السودان

١/ معلومات شخصية:

الاسم: ..............................................................

٢/ الجنس: ذكر ( ) أنثى ( )

٣/ الفئة العمرية:
من 15 - 25 عام ( ) من 25 - 35 عام ( ) من 35 - 45 عام ( ) من 45 - 55 عام ( ) ما فوق 55 عام ( )

٤/ الحالة الاجتماعية:
متعزج ( ) غير متعزج ( )

٥/ الحالة الوظيفية:
موظف ( ) متقاعد ( ) طالب ( ) عاطل عن العمل ( )

٦/ المستوى التعليمي:
أبتدائي ( ) ثانوي ( ) جامعي ( ) فوق الجامعي ( )

ب/ معلومات المريض عن المرض وعلاجه

٧/ منذ متى وانت تعاني من مرض الفشل الكلوي؟
(أ) قبل من سنه (ب) سنة الى 5 سنوات (ج) أكثر من 5 سنوات ()

٨/ هل لديك قريب مصاب بنفس المرض؟
نعم ( ) لا ( )

٩/ ماما تعرف عن مرض الفشل الكلوي؟
يعرف مايكم ( ) يعرف القليل فقط ( ) لا يعرف ( )

١٠/ هل تجري جميع التحاليل الطبية التي يطلبها منك الطبيب بانتظام؟
لا دائمًا ( ) أحيانًا ( ) أبداً ( )

11/ كم مرة في الأسبوع يتم الغسيل الدموي لك؟
   (أ) مرة ( ) (ب) مرتين ( ) (ج) ثلاثة مرات ( )

12/ هل انت منظم في زيارة طبيبك المعالج كمتبعة؟
   (نعم ( ) لا ( )

13/ هل الدواء الذي تتناوله يفيدك صحياً؟
   (نعم ( ) لا ( )

14/ هل تأخذ الدواء بصورة منتظمة؟
   دائمًا ( ) أحيانًا ( ) نادراً ( ) لا ( )

15/ هل يحدث لك الدواء مضاعفات؟
   (نعم ( ) لا ( )

16/ هل تتبع نظام غذائي معين؟
   (نعم ( ) لا ( )

17/ هل إحدى النظم الغذائية تنتج إيجابيًا معك؟
   (نعم ( ) لا ( )

18/ هل تشعر أن النظام الغذائي يقيدك ولا يعطيك الحرية في تناول ما تريده؟
   (نعم ( ) لا ( )

19/ هل تشعر بالملل من النظام الغذائي؟
   (نعم ( ) لا ( )

20/ هل انت على علم تمامًا بالسمومات والمنبهات من المنتجات الغذائية في نظامك الغذائي؟
نعم ( ) لا ( ) أعلم القليل فقط ( )

21/ ما هي كمية البروتين المصرح لك بتناولها؟

100 جرام ( ) 60 جرام ( ) لأعلم ( )

22/ هل تتبع جميع النصائح والطعام الغذائي الذي يصفه لك الطبيب؟

دائمًا ( ) أحيانًا ( ) نادراً ( ) لا ( )

معلومات عن اتجاهات المريض

23/ هل يؤثر مرض الفشل الكلوي سلبًا على حياتك؟

نعم ( ) لا ( )

24/ هل تشعر بالضيق لطول فترة العلاج؟

نعم ( ) لا ( )

25/ هل تتلقى توعية صحيه تامة ( تنفيذ صحي ) عن المرض من الممرضات؟

نعم ( ) لا ( )

26/ هل تشعر بالتعب والمشقة الجسمية بعد عملية الغسيل الدموي؟

نعم ( ) لا ( )

27/ هل توجد كوازير طبية مؤهلة لاداء الغسيل الدموي؟

نعم ( ) لا ( )