RISK FACTORS OF CHRONIC KIDNEY DISEASE AMONG PATIENTS ATTENDING OLABISI ONABANJO UNIVERSITY TEACHING HOSPITAL SAGAMU, OGUN STATE

BY

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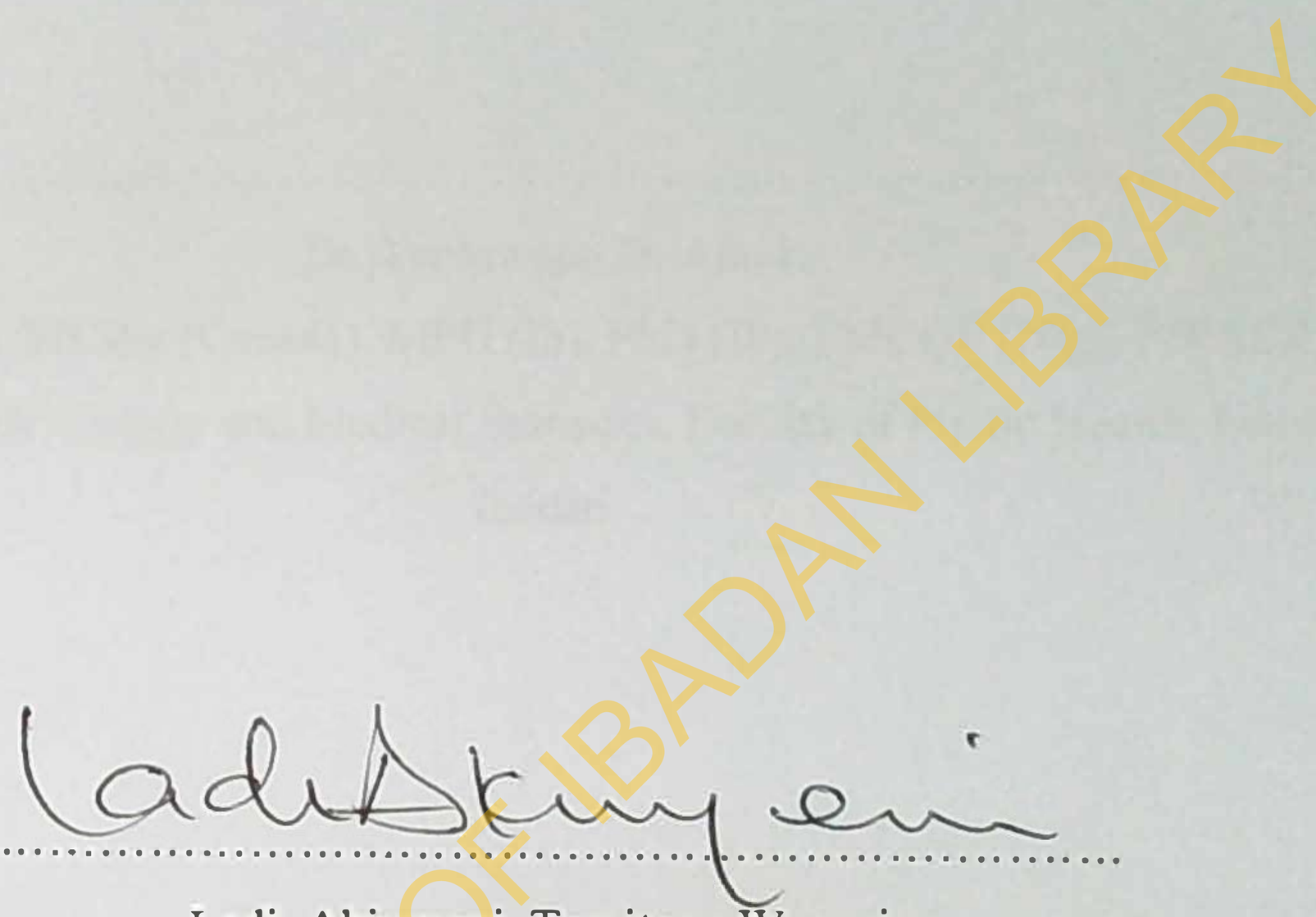
IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF MASTERS OF SCIENCE DEGREE IN EPIDEMIOLOGY AND MEDICAL STATISTICS

JUNE 2014

DECLARATION

I hereby declare that this work is original. The work has neither been presented to any other faculty for the purpose of the award of a degree nor has it been submitted elsewhere for publication.



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CERTIFICATION

We certify that this work was carried out in the Department of Epidemiology and Medical Statistics, Faculty of Public Health, University of Ibadan under our supervision

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DEDICATION

This project is dedicated to the memory of my late father Late Pa Peter Sisan Solarin. "Separated by death, together by love" Miss you Daddy.

ACKNOWLEDGEMENTS

My sincere gratitude to God Almighty for his mercy and grace upon me all the times

I would like to say thank you to my supervisor, Dr Ikeoluwa.O Ajayi, for her unrelenting support toward the success of this work. I am very grateful ma. I thank all my teachers who contributed to my knowledge in Epidemiology and Medical Statistics. My appreciation also goes to Dr Babatunde Adedokun and Dr Akinyemi for their contribution to this project. I really appreciate the contributions of all my class mates in the Msc class especially Dr Alagi, Dr Ibrahim and Miss Tinu Fatoki to the success of this program.

I cannot thank my husband and my children enough, may the good Lord keep them and shower his blessing on them.

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LIST OF ABBREVIATIONS

CKD	Chronic Kidney Disease
GFR	Glomerular Filtration Rate
OOUTH	Olabisi Onabanjo University Teaching Hospital
NKF	Nathan Kidney Foundation
AOR	Adjusted Odds Ratio
HIV	Human Immunodeficiency Virus
AIDS	Acquired Immune Deficiency Syndrome
eGFR	estimated Glomerular Filtration Rate
EPO	Erythropoietin
ESRD	End Stage Renal Disease
DM	Diabetes Mellitus
AVF	Arterio – venous Fistula
KDOQI	Kidney Disease Outcome Quality Initiative
ACR	Albumin Creatinine Ratio
LGA	Local Government Area
OND	Ordinary National Diploma
SPSS	Statistical Package for Social Sciences
SBP	Systolic Blood Pressure
DBP	Diastolic Blood Pressure
HBP	High Blood Pressure
HTN	Hypertension
CGN	Chronic Glomerulo Nephritis
NSAIDs	Non-Steroidal Anti- Inflammatory Drugs
WHO	World Health Organisation
UTI	Urinary Tract Infection
BMI	Body Mass Index

ABSTRACT

Introduction

Chronic kidney disease is a slow progressive loss of kidney function over a period of several years. Chronic kidney failure is much more common than what people realize and often go undetected and undiagnosed until the disease is well advanced and kidney failure is imminent. Global statistics show the incidence of CKD is increasing by 6 -7 % every year. It is estimated that about 36 million Nigerians are suffering from one stage of CKD as one in seven Nigerians have kidney disease. Studies had shown that CKD is common among people over 60 years old, but presently CKD is now seen among the middle age and even frequent among young adult. Lack of awareness on CKD is a major challenge noting that when people have adequate knowledge on the disease and the risk factors of the disease they will know how to prevent the disease. Despite the identified risk factors, there is still an increase in the incidence and prevalence of CKD, therefore a review of the risk factor of CKD has become necessary. Hence this study aimed at determining the risk factors of CKD among patients attending Olabisi Onabanjo University Teaching Hospital.

Methods

The research was a case control study, 150 cases and 300 controls were selected using systematic sampling technique. Selection of cases and controls was by a retrospective review of records of in-patients at the clinics/admissions from January 2008 to December 2012 in OOUTH, Sagamu. A semi-structured pro-forma was used to extract information on socio-demographic variables and risk factors associated with chronic kidney diseases. Data was analyzed using descriptive statistics, Chi-square and multivariate logistic regression at 5% level of significance.

Results

The mean age of the cases was 40.6±14.4 years and the controls were 38.6±15.8. The highest numbers of cases (24.7%) were between ages 20 – 29 years. Three hundred and two (67.1%) of the subjects were males, 207(46%) had secondary education, 218(48.4%) of the subjects were unskilled workers and 286(63.6%) of the subjects were

married. One hundred and twenty one (80.7%) of the cases and 224(74.7%) of the controls had education lower than tertiary, the odds of having education lower than tertiary was 42% higher among the cases of CKD compared with the controls (OR-1.42, CI-0.88-2.30). One hundred and thirty (86.7%) of the cases and 106 (35.3%) of the controls ingest herbal concoction, respectively, CKD patients were 12 times more likely to ingest herbal concoction compared with the controls (OR-11.90, CI-7.02-20.15). The number of cases 90(60%) with high blood pressure was significantly more than the number of controls 106(23.6%), (x^2=165.961; p-value <0.001). The odds of presence of high blood pressure were higher among the cases of CKD compared with the controls (OR-26.63, CI-14.61-48.53). Ten (6.7%) of the cases were HIV positive compared with 2(0.7%) of the controls, the odds of positive HIV status were higher among the cases of CKD compared with the controls (OR-10.64, CI-2.30-49.22). Ninety eight (64.0%) had history of chronic use of analgesic compared with 10(3.3%) of the controls. Chronic kidney disease patients were 52 times more likely to have exposure to chronic use of analgesics compared with the controls (OR-51.56, CI-25.27-105.19). Result of logistic regression revealed that the predictors of chronic kidney disease were being married (AOR-0.49, CI-0.25-0.98), alcohol consumption (AOR-0.39, CI-0.18-0.83), ingestion of herbal concoction (AOR-10.68, CI-4.88-23.34), elevated systolic (AOR-3.73, CI-1.72-8.08) and diastolic blood pressure (AOR-2.63, CI-1.29-5.35) at presentation, and history of high blood pressure (AOR-6.55, CI-3.07-13.97) and addition of salt to cooked food prior consumption (AOR-4.22, CI-2.07-8.61).

Conclusion

This study revealed that CKD is still a problem of Public Health importance with high fatality and mostly found among married adult in their productive age. Most CKD patients have elevated blood pressure, they consume alcohol and ingest herbal concoction. In order to curtail the menace of CKD, this study had provided information that there should be increase awareness and campaign on the causes and risk factors of CKD, hypertensive patients should adhere to their anti-hypertensive and individual should disengage from ingestion of herbal concoction and reduce alcohol consumption.

Keywords: Risk factors, chronic kidney disease, adult patients

CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Chronic Kidney Disease (CKD) is a worldwide health problem (Hsu CY et al., 2001). The burden of CKD and its very high cost of care is a challenge especially in developing countries. Information on the prevalence of CKD in Nigeria is scares. Hospital based data in Nigeria have reported prevalence of CKD in relation to other hospital admissions as ratio 1.6: (National kidney foundation, 2002).

Chronic Kidney Disease has been defined as either a level of glomerular filtration rate (GFR) < 60ml/min per 1.73m^2, which is accompanied in most cases by signs and symptoms of uraemia, or a need for initiation of renal replacement therapy (Alebiosu C.O, 2002a). Chronic kidney disease is a slow progressive loss of kidney function over a period of several years which could eventually lead to permanent kidney failure. Chronic kidney failure is much more common than what people realize and often go undetected and undiagnosed until the disease is well advanced and kidney failure is imminent. Most people realise they have kidney failure when their kidney function is down to 25% of normal (Ogun S.A et al., 2000).

As kidney failure advances and renal function is seriously impaired, dangerous level of fluid and waste can rapidly build up in the body. Treatment is aimed at stopping or slowing down the progress of the disease. This is done by controlling its underlying cause. If CKD ends in end- stage kidney failure, the patient will have to survive only on dialysis (artificial filtering) or kidney transplant (Ogun S.A et al., 2000).

Chronic renal failure is a term that is sometimes used but means much the same as CKD. The CKD is a better term, as the word failure implies that the kidneys have totally stopped working. In most cases of CKD this is not so. In most people who have CKD there is only a mild or moderate reduction in kidney function, which usually does not cause symptoms, and the kidneys have not 'failed'.

Hundreds of thousands of patients around the world suffer from a kidney disease. Sooner or later these patients will need a form of renal replacements therapy such as dialysis or renal transplantation (Alebiosu C.O, 2003a). This procedure saves lives but not without great cost,

which are becoming a major issue of western countries because it account for a significant proportion of health expenditure (Alebiosu C.O, 2003a). Epidemiological studies have shown that the incidence of CKD is higher in the developing countries than the developed world(Chijioke A et al., 2010).

In the developed countries, the risk factors commonly attributed to high prevalence of CKD are family history of kidney diseases, people over sixty years of age, atherosclerosis, bladder obstruction, and poor control of Hypertension (Alebiosu C.O, 2003a). In Nigeria the commonest risk factors of CKD are alcohol consumption, cigarette smoking, and ingestion of herbal concoction, obesity, glomerulonephritis, poorly controlled hypertension, diabetic mellitus and obstructive uropathy (Alebiosu C.O, 2003a).

In Olabisi Onabanjo University Teaching Hospital, the commonest non- infectious cause of medical admission are congestive heart failure 178(9.2%) , cerebrovascular disease 169 (8.7%), chronic kidney disease 153 (7.9%) with case fatality rates of 16%, 50% and 55% respectively (Ogun S.A et al., 2000) and CKD being the third most prevalent cause of medical admission in OOUTH (Ogun S.A et al., 2000).

1.2 Problem Statement

No fewer than 27 million Nigerians have chronic kidney disease (a precursor to kidney failure) with incidence of 100 per million population (that is15,000 new cases every year) and prevalence of 300 to 400 million (that is 45,000 living with kidney failure annually), according to the Nathan Kidney Foundation (NKF)

The incidence of CKD, in Nigeria has been shown by various studies to be in the range of 1.6 and 12.4 %. In the paper titled "The Epidemiology of End-Stage Renal Disease in Nigeria: The Way Forward", it was reported that mortality rate arising from CKD is very high, ranging between 40 and 50 per cent.

Today, the burden of CKD, in Nigeria is appreciable. Global statistics show the incidence is increasing by 6- 7 % every year. An estimated 15,000 new CKD cases occur in Nigeria each year although observers believe the figure could be much higher. Available statistics indicate that kidney failure is increasing worldwide by approximately 7 per cent annually.

It is also estimated that about 36 million Nigerians are suffering from one stage of CKD as one in seven Nigerians have kidney disease. Report also have it that less than 1,000 are on dialysis, although some people are now surviving CKD after kidney transplant, an expensive lifesaving procedure.

Hypertension is the leading cause of kidney failure in Nigeria (Alebiosu C.O, 2003a). Because hypertension causes no symptoms and medications are expensive and may cause unwanted side effects, many find adherence with required treatment difficult and this further compound the problem of hypertension related kidney disease (Alebiosu C.O, 2003a).

Unfortunately, quite a high number of patients with CKD in Nigeria end up with no treatment option. In other words, they just wait to die due to unawareness, inability to afford treatments and inaccessibility to good treatment modalities. The result of a study on the awareness of kidney disorders in Nigeria demonstrated that there was a low awareness of the populace regarding the prevalence, the cause and prevention of kidney diseases in the environment (Alebiosu C.O, 2002b). The emergence of diabetes mellitus as an increasingly common cause has been documented in a study where diabetes mellitus was found to be the third commonest cause of end stage renal disease and constituted 28.4% of cases (Alebiosu C.O, 2003a).

The incidence of kidney disease cuts across most ages and the prevalence is highest among patients aged between 20 and 50 years (Chijioke A et al., 2010). Studies had shown that the mean age of patient with CKD was 42.55 ± 15.43years and most of the patients seen were less than 60years of age (Ulasi I. I and Ijoma C. K, 2010),(Afolabi MO et al., 2009, Shittu AO et al., 2013). This means that a significant number falls within the working population and may pose a serious threat to the future of Nigeria's economy.

It has been revealed that more people die every day from kidney related diseases than malaria and HIV/AIDS in Nigeria (Afolabi M.O et al., 2009). Expert has raised alarm that kidney failure in pregnancy has become a leading cause of maternal mortality in the country even as it called for the enactment of a solid organ transplant edict as a matter of urgency (Afolabi M.O et al., 2009)

1.3 Justification of the study

Nigerian health-care delivery system has been described as sparsely and ill-equipped to deal with the increasing rate of patients suffering from chronic kidney disease (Ulasi I. I and Ijoma C. K, 2010), so the health care delivery need more of prevention strategies. It has been observed that poverty, inadequate health facilities and lack of subsidy for medical treatment have been the main factors contributing to the increasing rate of chronic kidney disease in the country (Ulasi I. I and Ijoma C. K, 2010).

Studies have also revealed that lack of awareness on the disease is a major challenge noting that when people are educated on the disease they will know how to prevent the disease (Alebiosu C.O, 2002a). Kidney problems have been dubbed a silent killer, awareness of CKD should be on the increase. kidney failure is expensive to treat anywhere in the world, but the difference in developed countries is that government gets involve in the treatment by introducing a kind of subsidy which is usually up to 80 per cent (Afolabi M.O et al., 2009). Nigerian government need to join countries like Sudan and the US to subsidies the treatment of CKD.

There are several risk factors ascribed to chronic kidney disease many of which are related to life-style, for example consumption of alcohol, cigarette smoking. Some socio- cultural practices had been documented, a good example is ingestion of herbal concoction and scarification marks. Studies had revealed that disease state such as poorly controlled hypertension, poorly controlled diabetic mellitus, sickle cell nephropathy, infection and obesity are risk factor of CKD. Some dietary habit had been implicated for example adding salt to cooked food before consumption and consumption of can food. Age is another important risk factor of CKD, most patient of CKD in the developed countries are ages greater than 60 years but in the developing countries, their ages are less than 60 years (this are working population), this will directly or indirectly affect the economy of the country.

Many of the studies on CKD were conducted outside Nigeria with few recorded in Nigeria, these few studies in Nigeria worked on knowledge and awareness of CKD. Not so much has been documented on risk factors, hence this study aimed at determining risk factors associated with CKD among patients attending Olabisi Onabanjo University Teaching

Hospital. Findings from this study will help in providing evidence – based information to appropriate intervention for this environment.

1.4 Research questions

This study addressed specific questions,

1. What are the risk factors associated with chronic kidney disease among patients attending OOUTH, Sagamu?

2. What are the socio-demographic characteristics of chronic kidney disease patients attending OOUTH, Sagamu?

3. What proportion of chronic kidney disease patients has developed end stage renal disease at the study site?

1.5 Objectives

1.4.1General Objectives: The general objective of this study is to determine the risk factors associated with chronic kidney disease among patient attending OOUTH Sagamu.

1.4.2 Specific Objectives: The specific objectives are to determine

1. the risk factor associated with chronic kidney disease in OOUTH Sagamu
2. The type of kidney disease that is common among chronic kidney disease patients attending OOUTH, Sagamu.
3. the proportion of chronic kidney disease patients with end stage renal disease in OOUTH Sagamu.

CHAPTER TWO

LITERATURE REVIEW

2.1 What is chronic kidney disease (CKD)?

A patient is diagnosed with chronic kidney disease, when the patient's glomerular filtration rate (GFR) is less than 60 mL/min/1.73m^2 for more than three months (Alebiosu C.O, 2003b)

OR

Evidence of kidney damage for more than three months, regardless of the GFR

Kidney damage can be any of the following:

albuminuria

haematuria

pathological abnormalities (such as an abnormal kidney biopsy result)

structural abnormalities (such as an abnormal kidney ultrasound result) (Alebiosu C.O, 2003b)

The stages of CKD

Kidney function can be classified into stages (Fresenins medical care, 2000) depending on the eGFR.

Stage 1:	A normal GFR greater than or equal to 90 mL/min/1.73m^2
Stage 2:	Slightly decreased GFR between 60-89 mL/min/1.73m^2 If the kidney function is at stage 1 or 2, the patient only have CKD if the patient have albuminuria, haematuria, a pathological abnormality or a structural abnormality.
Stage 3a:	Mild-moderate decrease in GFR between 45-59 mL/min/1.73m^2
Stage 3b:	Moderate-severe decrease in GFR between 30-44 mL/min/1.73m^2
Stage 4:	Severe decrease in GFR between 15-29

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Stage 4: Severe decrease in GFR between 15-29

	mL/min/1.73m^2
Stage 5:	Kidney failure as GFR decreases to less than 15 mL/min/1.73m^2 or dialysis is started

The eGFR and albuminuria results are combined to provide an overall picture of how well the kidneys are working. Doctor uses this information to decide which treatment is best for the patient. Treatment also depends on the cause of the kidney damage. Controlling diabetes and high blood pressure can help to slow or prevent further kidney damage. It also reduces the risk of other health problems, such as heart attacks and strokes. Many factors affect the progress of kidney failure and these are not completely understood (Fresenins medical care, 2000).

EARLY STAGES

In the early stages of kidney disease, there is only a small amount of damage to the kidneys. The early stages of kidney disease can cause scarring and blockages that change blood flow to parts of the kidneys so they are not working as well as they should. Even in the early stages of chronic kidney disease the risk of cardiovascular disease (such as a heart attack or stroke) has been shown to increase, so measures to reduce this risk are essential.

In the early stages patient may have no symptoms and blood tests can be normal. However patient can be at more risk of dehydration and have a higher sensitivity to medications. It is very important to talk to the doctor before starting any new medications. Maintaining a good blood pressure and following any suggested dietary changes, may delay or prevent progress to the next stage (Fresenins medical care, 2000).

MIDDLE STAGES

In the middle stages of kidney disease symptoms may begin to appear as the level of waste products in the blood rises. Patient may begin to feel unwell and notice changes in the number of times he urinates. As the kidneys slow down, blood pressure rises. High blood pressure can increase the risk of cardiovascular disease. Early signs of bone disease may also be present. It is very important to work with the health care team to treat these conditions and prevent other problems developing later on.

Anaemia can also appear during these stages. Anaemia is caused when there are not enough red blood cells in the blood. Red blood cells carry oxygen so anaemia makes patient feel weak,

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Stage 5:	Kidney failure as GFR decreases to less than 15 mL/min/1.73m^2 or dialysis is started

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MIDDLE STAGES

In the middle stages of kidney disease symptoms may begin to appear as the level of waste products in the blood rises. Patient may begin to feel unwell and notice changes in the number of times he urinates. As the kidneys slow down, blood pressure rises. High blood pressure can increase the risk of cardiovascular disease. Early signs of bone disease may also be present. It is very important to work with the health care team to treat these conditions and prevent other problems developing later on.

Anaemia can also appear during these stages. Anaemia is caused when there are not enough red blood cells in the blood. Red blood cells carry oxygen so anaemia makes patient feel weak,

tired and short of breath. Anaemia can be treated with erythropoietin (EPO) which is a body chemical (hormone) mainly made by the kidneys that tells the bone marrow to make red blood cells.

LATER STAGES

In the later stages of CKD patient will start to notice changes in the amount of urine passed and high blood pressure almost always occurs. The amount of albumin in the urine increases, as do the levels of creatinine and urea in the blood. There may be need for dietary changes including limiting your use of salt or reducing the amount of potassium or phosphorus in the diet.

End stage kidney disease is the last stage of CKD. The kidneys are only functioning at 10-15% and are unable to properly filter waste products, remove extra water from the body and help to maintain the blood's chemical balance. Now it's time to begin preparing for dialysis or a kidney transplant (Fresenins medical care, 2000).

2.2 Burden of CKD

Chronic kidney disease is a problem of enormous magnitude, and it is quite ironic that incidence of this traumatizing ailment is on the increase. Presently, CKD has become a worldwide public health problem. Nothing confirms this more than the 2002 World Health Report and the Global Burden of Disease Project reports, which shows that diseases of the kidney and urinary tract are responsible for approximately 850,000 deaths every year and over fifteen million disability-adjusted lives. Globally, these ailments represent the 12th cause of death and 17th cause of disability (Odubanjo M.O et al., 2011). About 1 in 10 people have some degree of CKD (Odubanjo M.O et al., 2011). It can develop at any age and various conditions can lead to CKD. It becomes more common with increasing age and is more common in women in the developed countries (Odubanjo M.O et al., 2011).

Chronic kidney disease (CKD) means that an individual's kidneys are not working as well as they once did. Various conditions can cause CKD. Severity can vary but most cases are: mild or moderate, occur in any age group but more common in older people (in the developed countries), do not cause symptoms and do not progress to kidney failure. People with any stage of CKD have an increased risk of developing heart disease or a stroke. This is why it is

important to detect even mild CKD, as treatment may not only slow down the progression of the disease, but also reduce the risk of developing heart disease or stroke (Odubanjo M.O et al., 2011)

Chronic renal failure is a major cause of premature death and morbidity in Nigeria (Afolabi M.O et al., 2009). Unfortunately, majority of those with end stage renal failure who are in the most productive age bracket of 17-55years do die from inability to pay the cost of regular heamodialysis which is the most commonly available mode of care. Furthermore the quality of life of the few that can afford the cost is poor compared to that of the few transplant patients which is good (Alebiosu C.O, 2003b)

2.3 Risk factors of CKD

A risk factor is something that increases the likelihood of getting a disease or condition. Risk factors of chronic kidney disease (Jerime A et al., 2002) : are Risk of CKD increases with age, 60 years or older (in the developed countries), but less than 60 years (in developing countries) Result of a study conducted in Olabisi Onabanjo University teaching hospital on chronic renal failure revealed that the peak age of the patients was between 20-49 years, with a mean of 39.6±14.8 (range 14–72years) (Alebiosu C O et al., 2006). Another study from Ladoke Akintola University Teaching Hospital on the prevalence of chronic kidney disease in a Nigeria family practice population shows that the majority of the study subjects were 45 years and older. This study also shows that significant risk factors to chronic kidney diseases are age above 55 years. (Afolabi M.O et al., 2009).

Sex is another risk factor, men are more likely than women to develop ESRD, while CKD is more common among women, men with CKD are 50% more likely than women to progress to kidney failure (Arije A et al., 2000), (Fresenins medical care, 2000). Result from a study in India on epidemiology and risk factors of CKD revealed that patients with CKD were more likely to be male, (Singh AK et al., 2013). Study conducted in Olabisi Onabanjo University teaching hospital on chronic renal failure revealed that there were 90 males and 63 females (Alebiosu C O et al., 2006). Other risk factors that are categorised under socio demographic causes are educational level of the patients, people with a lower educational background have a higher risk of developing CKD and people with family history of CKD have higher risk of developing CKD.

Cigarette smoking and heavy alcohol consumption had been identified as risk factor of CKD, finding from study on smoking is a risk factor in the progression to kidney failure

found that the risk of kidney failure was three to four times higher in smokers) (Hallan S I and Ortho S R, 2011). Smoking has been linked to the progression of renal disease among diabetic and hypertensive patients(EBSCO DynaMed website, 2013). Ingestion of herbal concoction had been implicated as a risk factor of CKD, study from Ladoke Akintola revealed that habitual use of herbal medications was a significant risk factor of CKD (Afolabi M.O et al., 2009).

Health related risk factors are; diabetes, established heart problems (heart failure or past heart attack) and/or stroke, high blood pressure and obesity (Body mass index ≥ 30). Inadequately controlled diabetes is the biggest risk factor for developing CKD, about one-third of the people who develop ESRD have diabetes. Inadequately controlled hypertension is the second most common cause of CKD (National Institute of Diabetes & Digestive & Kidney Diseases website, 2010, Hill G S, 2008). Result from a study in India on epidemiology and risk factors of CKD revealed that patients with CKD are more likely to be overweight or obese, to have diabetes, hypertension and cardiovascular disease than patients without CKD. The most common risk factors and other characteristics among the subjects diagnosed with CKD were hypertension (64.5%), anaemia (40.7%) and diabetes (31.6%) (Singh AK et al., 2013). A previous study conducted at Ladoke Akintola University Teaching Hospital Ogbomosho showed that significant risk factors to chronic kidney disease are elevated systolic blood pressure, elevated diastolic blood pressure, history of diabetes mellitus (DM), habitual use of analgesic and herbal medications, as well as abnormal waist-to-hip ratio, (Afolabi M.O et al., 2009).

Uses of recreational drugs, notable examples are opiates and cocaine has been linked to an increased risk for chronic renal disease. Overuse of over-the-counter pain medication or abuse of illegal drugs increases risk of CKD. Another study conducted in USA, on Lifestyle risk factors and chronic kidney disease showed that cases with CKD were more likely than controls to have a lower level of education, use analgesic medications daily, and has histories of hypertension and diabetes (Vupputuri S and Sandler D P, 2003).

Another risk factor of CKD is renal disease a good example is glomerulonephritis; this disease damages the glomeruli, which are the filtering units in the kidney. It is the third leading cause of CKD. Other diseases conditions also affect the kidney functions are kidney stones, Polycystic kidney disease (cysts in the kidney), Systemic lupus erythematosis, Congenital nephrotic syndrome and atherosclerosis (National Institute of Diabetes & Digestive & Kidney Diseases website, 2010). Result of a study conducted in Olabisi Onabanjo University teaching hospital on chronic renal failure revealed that the commonest

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Health related risk factors are; diabetes, established heart problems (heart failure or past heart attack) and/or stroke, high blood pressure and obesity (Body mass index ≥ 30). Inadequately controlled diabetes is the biggest risk factor for developing CKD, about one-third of the people who develop ESRD have diabetes. Inadequately controlled hypertension is the second most common cause of CKD (National Institute of Diabetes & Digestive & Kidney Diseases website, 2010, Hill G S, 2008). Result from a study in India on epidemiology and risk factors of CKD revealed that patients with CKD are more likely to be overweight or obese, to have diabetes, hypertension and cardiovascular disease than patients without CKD. The most common risk factors and other characteristics among the subjects diagnosed with CKD were hypertension (64.5%), anaemia (40.7%) and diabetes (31.6%) (Singh AK et al., 2013). A previous study conducted at Ladoke Akintola University Teaching Hospital Ogbomosho showed that significant risk factors to chronic kidney disease are elevated systolic blood pressure, elevated diastolic blood pressure, history of diabetes mellitus (DM), habitual use of analgesic and herbal medications, as well as abnormal waist-to-hip ratio, (Afolabi M.O et al., 2009).

Uses of recreational drugs, notable examples are opiates and cocaine has been linked to an increased risk for chronic renal disease. Overuse of over-the-counter pain medication or abuse of illegal drugs increases risk of CKD. Another study conducted in USA, on Lifestyle risk factors and chronic kidney disease showed that cases with CKD were more likely than controls to have a lower level of education, use analgesic medications daily, and has histories of hypertension and diabetes (Vupputuri S and Sandler D P, 2003).

Another risk factor of CKD is renal disease a good example is glomerulonephritis; this disease damages the glomeruli, which are the filtering units in the kidney. It is the third leading cause of CKD. Other diseases conditions also affect the kidney functions are kidney stones, Polycystic kidney disease (cysts in the kidney), Systemic lupus erythematosis, Congenital nephrotic syndrome and atherosclerosis (National Institute of Diabetes & Digestive & Kidney Diseases website, 2010). Result of a study conducted in Olabisi Onabanjo University teaching hospital on chronic renal failure revealed that the commonest

causes were chronic glomerulonephritis 63(41.2%), hypertensive nephrosclerosis 40(26.1%) and diabetes mellitus 20(13.1%). The mean presenting systolic and diastolic blood pressures were 167.34±37.6mmHg and 106.03±28.9 mmHg respectively (Alebiosu C O et al., 2006).

2.4 Challenges of CKD in Nigeria

The attention being paid globally to CKD is attributable to five factors:

The rapid increase in its prevalence, the enormous cost of treatment, recent data indicating that overt disease is the tip of an iceberg of covert disease, an appreciation of its major role in increasing the risk of cardiovascular disease, and the discovery of effective measures to prevent its progression.

These factors render CKD an important focus of health care planning even in the developed world, but the problems they delineate in the developing world are far more challenging. Some 85% of the world's population lives in low-income or middle-income countries, where the clinical, epidemiologic, and socioeconomic effects of the disease are expected to be the greatest. Data from the United States suggest that for every patient with ESRD, there are more than 200 with overt chronic kidney disease (stage 3 or 4) and almost 5000 with covert disease (stage 1 or 2) (Levey AS et al., 2009) Mortality, for CKD, is directly related to the technical and organizational competence of programs offering renal-replacement therapy. An estimated 11.5 per cent of adults ages 20 or older (23 million adults) have physiological evidence of CKD determined from data collected through the National Health and Nutrition Examination Survey in United State of America (Wish JB). Hospital based data in Nigeria have reported prevalence rates of between 1.6 and 8%.The most common risk factors of CKD in the developed world are diabetes mellitus and hypertension. However, in Nigeria, the commonest risk factors are hypertension and chronic glomerulonephritis (Levey AS et al., 2009) (Rodriguez JA et al., 2000)

The United States Institute of Medicine has recommended that female patients with chronic kidney disease should be referred to a nephrologist for initial consultation when their serum creatinine is 1.5mg/dl and male patients should be referred when their serum creatinine is 2.0mg/dl (NKF-K/DOQI, 2001). Patient with GFR of less than 60ml/min should also be referred to the nephrologist for management. However, in developing countries like Nigeria, late referral is very common. Patients are usually referred to the nephrologist when they have stage 4 or 5 chronic kidney disease, and in most cases with features of ureamia. This late referral is also experienced to a lesser extent, in developed countries of the world. In Europe

approximately 30% of dialysis patients are referred late to the nephrologist in the final months preceding dialysis treatment (Kinchen KS et al., 2002). In Nigeria there is no available data on late referral from literature search. Early referrals to the nephrologists lead to better management of these patients and this helps to slow the progress to end stage renal failure. Late referral leads to the following;

i) Increase use of haemodialysis over peritoneal dialysis

ii) Poorer nutritional status, poorer patient's rehabilitation

iii) Increased use of temporary vascular access, with associated increased access failure and increased morbidity (Levinsky NG, 2002).

CKD patient referred early to nephrologist also have the time to plan with their nephrologist for the creation of native Arterio-venous fistula (AVF), if they have chosen haemodialysis as the mode of treatment they prefer or can afford when they progress towards ESRD. It is widely accepted that the optimal vascular access device is the AVF (Weiss FM),(Wish JB). Majority of patients undergoing dialysis in Nigeria make use of temporary form of vascular access mainly due to the following (Wish JB); late referral, few vascular surgeons skilled in the art of AVF creation in Nigeria, Cost, (it cost about twenty five thousand naira)

The contribution of primary care to outcome in patients with chronic kidney disease has not been demonstrated (Wish JB). Given the magnitude of the rapid increase in the number of cases of chronic kidney disease, primary care evaluation and timely referral are recommended. The Kidney Disease Outcome Quality Initiatives (KDOQI) endorses a model of collaboration between primary health care physician and sub-specialist (Wish JB). Primary health care system is not well developed in Nigeria. Most communities do not have a primary health centre and this makes it difficult to identify a large pool of people with chronic kidney disease and those at risk of developing the disease. Where the facility exists there is lack of doctors to effectively man the hospital. Our patient was diagnosed as having hypertension first time, when he presented with features of chronic kidney disease in a private hospital. Examination finding showed that he had features of long standing hypertension

Patients with chronic kidney disease in Nigeria find it extremely difficult to afford dialysis (Wish JB). The cost of single session of haemodialysis in Nigeria is about twenty five thousand naira. A patient on chronic dialysis needs to be dialyzed at least three times a week. The minimum wage is less than twenty thousand naira, and a fresh graduate earns less than

hundred thousand naira a month. Our patient makes less than twenty thousand naira a month and could not afford the cost of dialysis, and was managed conservatively.

Peritoneal dialysis is a long time treatment alternative for any patient with end-stage renal disease. Peritoneal dialysis has some medical advantages over haemodialysis in some circumstances. Initiation of haemodialysis in newly diagnosed end-stage kidney failure is associated with a rapid decline in what is left of kidney function. Treatment with peritoneal dialysis preserves native kidney function longer. This advantage has led several experts to recommend that peritoneal dialysis is the best modality to use early in the course of renal failure. There are some relative contraindications to peritoneal dialysis (Wish JB). Another advantage is that it can be carried out at home by the patient.

Unfortunately, there are only very few centres in Nigeria where this service is offered. Where available it is also much more expensive than haemodialysis. The anaemia of chronic kidney disease is caused primarily by deficiency of erythropoietin. K/DOQI recommends a target haematocrit/haemoglobin of 33-36%/l l-13mg/dl. This is supported by a number of studies that demonstrated that this haematocrit/haemoglobin level is associated with improved functional and cognitive status, improved quality of life, regression of left ventricular hypertrophy, and decreased morbidity and mortality when compared with patients with chronic renal failure and lower haematocrit and haemoglobin levels(Wish JB).

A dose of erythropoietin of 50IU/kg of body weight three times weekly intravenously, during the later phase of dialysis is recommended for those on dialysis. With the dose titrated at monthly interval depending on the haematocrit response. Haemoglobin target should be reached in 3-4months (1g/dl per month). Maintenance dose is usually reduced to 50-75% of the initial dose. Erythropoietin is an expensive drug. It cost at least twenty two thousand naira (cheapest brand) for a pack of 6 vials. An 80kg patient on dialysis will need a pack a week. This implies that patients would have needed about eighty eight thousand naira to buy erythropoietin monthly. For pre dialysis patients, and patient on peritoneal dialysis, the 50IU/kg two times a week subcutaneously, is usually recommended, although some nephrologists may prefer 30IU. The cost is beyond the reach of average Nigeria with CKD.

Renal transplant is better treatment modality for end stage chronic kidney disease than dialysis because it corrects the endocrine function that is lost in patient with ESRD. Kidney transplant is a very expensive procedure. There are only about 3 centres in Nigeria that offer

this service. Most patients that have undergone renal transplants had the procedure performed abroad. The cost of renal transplant offshore is about 7 million naira. Moreover, renal transplant patient are placed on immunosuppressive drugs for life. One of our renal transplant patients, a consultant surgeon, spends hundred thousand naira a month on immunosuppressive drugs. Nigerian nephrologists also lack facilities to adequately manage renal transplant patients. The plight of chronic kidney disease patients in Nigeria is multifaceted, the prevailing poverty in the country, lack of government attention to those with chronic CKD, low number of doctors in rural areas/ low number of nephrologist in the country and lack of facilities in the country to effectively manage these patients are major challenges encountered by those with CKD. They need help from the government and also from both local and foreign nongovernmental organizations.

2.5 Measuring CKD

Functions of the kidneys are:

(i) Filter out waste products from the bloodstream, to be passed out in the urine. (ii)Help control blood pressure - partly by the amount of water passed out of the body as urine and partly by making hormones which are involved in blood pressure control. (iii) Make a hormone called erythropoietin, which stimulates the bone marrow to make red blood cells. This is needed to prevent anaemia. (iv) Help keep various salts and chemicals in the blood at the right level (Arije A et al., 2000).

Signs of CKD

Kidney disease is called a 'silent disease' as there are often no warnings. It is not uncommon for people to lose up to 90% of their kidney function before getting any symptoms. The first signs may be general and include (Arije A et al., 2000): (i) High blood pressure, (ii) Changes in the amount and number of times urine is passed, e.g. at night, (iii) Changes in the appearance of urine, (iv) Blood in the urine, (v) Puffiness e.g. legs and ankles, (vi) Pain in the kidney area, (vii)Tiredness, (viii)Loss of appetite, (ix)Difficulty sleeping, (x)Headaches, (xi)Lack of concentration, (xii) Itching, (xiv) Shortness of breath, (xv) Nausea and vomiting, (xvi) Bad breath and a metallic taste in the mouth.

Diagnosis of CKD

If kidney disease is suspected, the patient will have some kidney function tests to measure how well his kidneys are working and help plan his treatment, (Fresenins medical care, 2000) these

tests include tests for albumin/protein and/or blood in the urine.

A blood test to find out the level of waste products in the blood and calculate the glomerular filtration rate

A blood pressure test as kidney disease causes high blood pressure, which can damage the small blood vessels in the kidneys. High blood pressure can also cause kidney disease.

An ultrasound or Computed Tomography scans show the size of the kidneys, locate kidney stones or tumours and find any problems in the structure of the kidneys and urinary tract.

The patient may also visit a kidney specialist (called a nephrologist) to help manage his care and decide if a kidney biopsy is needed. During a kidney biopsy a small piece of kidney tissue is removed and looked at under a microscope to find out the type of kidney disease and check if the kidneys are damaged (Fresenins medical care, 2000).

Kidney test results

The following blood and urine tests are commonly performed to assess kidney function, this include Glomerular filtration rate (GFR) is the best measure of kidney function and helps decide the stage of kidney disease. It shows how well the kidneys are cleaning the blood. GFR is usually estimated (eGFR) from the results of the creatinine blood test. eGFR is reported in millilitres per minute per 1.73m^2(mL/min/1.73m^2). eGFR can also be used to work out per cent of kidney function. This is an estimate of the level that each kidney is working. A GFR of 100 mL/min/1.73m^2 is in the normal range so it is useful to say that 100 mL/min/1.73m^2 is about equal to '100% kidney function'. A GFR of 50mL/min/1.73m^2 could be called '50% kidney function' and a GFR of 30 mL/min/1.73m^2 could be called '30% kidney function' (Jerime A et al., 2002).

Albuminuria can mean that the kidneys are damaged so albumin, a kind of protein, leaks into the urine. A small or 'micro' amount of albumin in the urine is called microalbuminuria, and a larger 'macro' amount is called macroalbuminuria. Albuminuria is often an early warning of kidney disease but can also be present for other reasons. Albuminuria can be detected by a special urine test called an albumin:creatinine ratio (ACR). An ACR is performed on a single sample of urine (Jerime A et al., 2002).

Haematuria or blood in the urine occurs when red blood cells leak into the urine. It can turn urine into a red or dark cola colour. Sometimes the blood in the urine is not visible to the eye, but may be found on a urine test. This is called microscopic haematuria. Blood in the urine is a

common sign of urinary tract infections but can also be the first sign of a problem with the kidneys or the bladder.

Creatinine is a waste product made by the muscles. It is usually removed from the blood by the kidneys and passes out in the urine. When the kidneys aren't working well, creatinine stays in the blood. A blood test helps to work out how quickly your kidneys remove or 'clear' creatinine from the blood. Creatinine is a good measure of kidney function as it does not change with diet. However it does vary with age, gender and body weight so is not an accurate way of measuring overall kidney function.

Urea is a waste product made by the body as it uses protein from the food we eat. If some kidney functions have been lost, the kidneys may not be able to remove all the urea from the blood.

Potassium is a mineral found in many foods. If kidneys are healthy, they remove extra potassium from the blood. If kidneys are damaged, the potassium level can rise and affect the heart. A low or high potassium level can cause an irregular heartbeat (Jerime A et al., 2002).

2.6 Treatment of CKD

With CKD, the damage to the kidneys is usually permanent. It cannot be fixed, but one can take steps to help slow down the CKD and keep the damage from getting worse (Bamgboye E.B, 2003).

Control of the blood sugar if the patients have diabetes, keep a healthy blood pressure, eat a heart healthy diet (low in salt and fat), exercise most days of the week, keep a healthy weight, do not smoke or use tobacco, limit alcohol consumption, talk to the doctor about medicines that might help protect the kidneys. If kidney disease is treated early, one might be able to slow it down! If kidney disease is not treated, it can cause the kidneys to fail, and the patient will need dialysis or a kidney transplant in order to live (Bamgboye E.B, 2003).

2.7 Complications of CKD

If the chronic kidney disease progresses to kidney failure, the following complications are possible

Anaemia, central nervous system damage, dry skin, skin colour changes, fluid retention - this can lead to swollen tissue, heart failure, and fluid build-up in the lungs, blood potassium

levels rise; this can result in heart damage, insomnia, lower libido, male erectile dysfunction, ostemalacia, Pericarditis, stomach ulcers, weak immune system (Bamgboye E.B, 2003).

2.8 Prognosis

Stages 1-3 CKD (mild-to-moderate) are common, with most cases occurring in older people. It tends to get gradually worse over months or years. However, the rate of progression varies from case to case, and often depends on the severity of any underlying condition. For example, some kidney conditions may cause kidney function to get worse relatively quickly. However, in most cases, CKD progresses only very slowly. Only a small number of people with CKD progress to end-stage kidney failure (stage 5 CKD) that requires kidney dialysis or kidney transplant (Rashad S and Barsoum M.D, 2006).

CHAPTER THREE
METHODOLOGY

3.1 Study area

The study was carried out in Ogun-State, South West Nigeria. Ogun State is one of the 36 States in the Federal Republic of Nigeria. It was carved out of the defunct Western State on the third day of February, 1976. It covers a total land area of 16,409.26 sq. km. it lies within the South- Western region of the country. It is bounded in the north by Oyo and Osun State, in the east by Ondo state, in the south by Lagos and in the west by the Republic of Benin. The state capital, Abeokuta, lies about 100km north of Lagos, Nigeria's commercial capital. The projected population of the State is 3,728098. The people of the state belong to the Yoruba ethic group of south-west Nigeria. The main ethnic groups of the state are the Egbas, Yewas, Eguns, Aworis ,Ijebus and Remos. A greater proportion of the state lies in the tropical rain forest zone. The main occupation in the state is farming, which is largely subsistence in scale. Cocoa and kola-nut are the main cash crops produced. The State is one of the highest producers of cocoa in the country. In the urban areas, petty trading and white-collar jobs are the major occupation. The industries and manufacture base is located at Abeokuta, Ota and Agbara.

The state has twenty (20) Local Government Areas, with each LGA headed by an executive chairman each. The state is divided into 8 geo political zones, 3 senatorial districts, 9 federal and 26 state constituencies. Ogun state has two federal hospital, one state tertiary health facility (Olabisi Onabanjo University Teaching Hospital), one private tertiary health facility (Babcock University Teaching Hospital), 904 private health facilities, 29 secondary health facilities and 424 primary health facilities.

3.2 Study site

The study was conducted at the Olabisi Onabanjo University Teaching Hospital (OOUTH) Sagamu, Ogun state. The OOUTH is a tertiary institution with two hundred and fifty beds and serve as a referral centre for other hospitals in and outside Ogun state. There are two main medical wards in the hospital, the male and the female medical ward, each of the wards accommodating a minimum of twenty five patients. The hospital also has a dialysis machine for patients with kidney failure. Every month the hospital admits about eight to ten CKD patients.

The health record department of OOUTH is made up of central record and about seven units. The central record serves administrative purposes. It is also the usual place where new case notes are retrieved and reference numbers are assigned. Case note of patients who have not visited the hospital in a long time are also kept at the central records. Recently retrieved case note from the wards are also kept there before sending them to the assigned units.

The pattern of flow of a CKD and the orthopaedic patient's case note is from the clinic to the ward (in case of admission) and from the ward to the central record after the patient has been discharged. In case of out-patient visit, the case note moves from the central records to the clinics and back to the central records. The control group for this study were patients from surgery department, orthopaedic unit.

3.3 Study design

A case control study was carried out. The ratio of case to controls was 1:2

Case definition – patients with GFR of less than 60 ml /min /1.73m^2 or evidence of kidney damage for more than three months.

Control definition – patients without evidence of kidney damage or with GFR of >90ml/min / 1.73m^2

3.4 Study population

The study population consisted of patients diagnosed of chronic kidney disease and accessing treatment at the nephrology unit of the internal medicine department of Olabisi Onabanjo University Teaching hospital, Sagamu Ogun State. Comparable controls were patients involved in road traffic accident and were being managed at the orthopedic unit of the surgery department of the same teaching hospital.

3.5.1 Inclusion criteria

For the cases- these were patients that were diagnosed of CKD and were been attended to by nephrologists in renal unit of internal medicine department, OOUTH.

For the control- these were patients that were involved in RTA and were managed by orthopedic surgeon in orthopedic unit of surgery department, OOUTH.

3.5.2 Exclusion criteria

For the cases- these were patients with other medical conditions except CKD.

Patients with GFR > 90mls/min/1.73m^2

For the control- these were patients that are diagnosed of other surgical conditions.

Patients with evidence of kidney damage

3.6 Sample size estimation

Since the study intend to determine the risk factors for CKD and the case fatality rate between the cases of chronic kidney disease and the control patients in OOUTH Sagamu, a sample size computation with statistical power component was more appropriate. According to a formula given by Kirkwood B.R and Sterne J.A.C (2005), it is expected that about 40% of control (p_0=0.4) was exposed to the risk factors, and we would like to detect a difference if exposure to the risk factors was associated with a twofold increase of chronic kidney disease (OR =2) with a power of 80%, confidence level of 95%, (Kirkwood B.R and Sterne J.A.C, 2003,) the sample size (n) is estimated thus;

$$n \text{ (each group)} = \frac{(p_0q_0 + p_1q_1)(z_{1-\alpha/2} + z_{1-\beta})^2}{(p_1 - p_0)^2}$$

Power =80%

Odds ratio (OR) = 2

The proportion of the population exposed to one or more risk factors in the control group is 0.4

Where p_1 = the proportion of exposure among cases

P_0 = the proportion of exposure among controls

$z_{1-\alpha/2}$ = value of the standard normal distribution corresponding to a significance level of alpha (1.96 for a two-sided test at the 0.05 level)

$z_{1-\beta}$ = value of the standard normal distribution corresponding to the desired level of power (0.84 for a power of 80%)

therefore

$p_0 = 0.40$

$q_0 = 1 - 0.104 = 0.60$

$p_1 = p_0 \times OR / 1 + p_0 (OR - 1)$

$= 0.40 \times 2 / 1 + 0.4 (2 - 1) = 0.57$

$q_1 = 1 - 0.57 = 0.43$

$$n = \frac{(0.40 \times 0.60 + 0.57 \times 0.43)(0.84 + 1.96)^2}{(0.57 - 0.40)^2}$$

n= 131.59806 =132

In order to increase the statistical power of the study, a ratio of 1: 2 was used. A total of 150 cases and 300 controls were studied.

3.7 Sampling technique

The patients diagnosed of CKD within January 2008 to December 2012 were one thousand and one hundred; selection of the case notes into the study for the cases was by systematic random sampling, 150 divided by1, 100 equal 1/ 7.3. Therefore the sampling fraction for the cases was 1/7, the sampling interval size (k) was 7. Number 3 was randomly selected from number 1 to 7. To select the case notes for this study, the third case note on the list was the first case note to be selected and every 7th case note therafter was selected into the study.

For the control, there were about three thousand three hundred and fifty orthopedic cases within January 2008 to December 2012. Selection of the case notes into the study was also by systematic random sampling, 300 divided by 3,300 equal 1/11. The sampling fraction was 1/11; the sampling interval size (k) was 11. Number 5 was randomly selected from number 1 to 11. To select the case notes for the control in this study, the fifth case note was the first case note to be selected and every 11th case note was selected into the study.

Selection of subjects

Selection of subjects was by a retrospective review of records of in-patients at the clinics/admissions from January 2008 to December 2012 in OOUTH, Sagamu. Those diagnosed to have CKD were selected into the study as the cases. While the control, were patients that were seen at the orthopedic unit, surgery department.

3.8 Data collection

A semi-structured pro-forma was used to extract variables needed from the case notes. The ~~pro-forma~~ obtained information on socio-demographic variables, admission and risk factors associated with chronic kidney diseases. The occupations of the patients were grouped into skilled, semi-skilled and unskilled. Skilled for professional and civil servant, Semi-skilled for artisans and unskilled for traders or business men and women, students and unemployed Information was sought on chronic kidney disease patients with end stage renal disease and the pro- forma extracted information on the type of kidney disease and the treatment outcome of patients with chronic kidney disease. The same was also done on the control group.

Four research assistants with Ordinary National Diploma (OND) in Health Information Management were trained for three days to assist with data collection. The research assistants were supervised daily. Data was extracted throughout the month of June 2013.

3.9 Data Analysis

Data was entered, cleaned and analysed with SPSS version 17. Socio-demographic categorical variables such as sex, marital status, religion, level of education and occupation were presented as proportions. Continuous variable were presented as percentages, means, standard deviation, median and range as appropriate. Data was presented using frequency tables and charts. Chi-square test was used to test for association between risk factors and CKD using a 2x2 contingency table. Independent variables from the bivariate analysis were entered into the logistic regression model at 10% level of significance, however variables with very wide confident interval were not entered as this will distort the result of the model. Predictors of CKD were determined at a level of statistical significance of 5%.

Variable included in the analysis

Dependent (outcome) variable

Cases of chronic kidney diseases

Independent variables

Socio – demographic characteristics of the cases and controls

Life style of the cases and controls

Medical history of the cases and controls

Drugs and dietary history of the cases and controls

History of End Stage Renal Disease

Treatment outcome of the cases and controls

3.10 Ethical considerations

Approval for the study was obtained from the OOUTH Ethical review Committee. Permission for the study was received from the Chairman Medical Advisory Committee of OOUTH, Sagamu. Permission to access the case note was sought from the head of the central records department. Strict confidentiality of all information and result of findings was maintained. Result of the information will be disseminated to the appropriate places.

CHAPTER FOUR

RESULTS

Out of five hundred pro forma filled, four hundred and seventy pro forma were completely filled but four hundred and fifty pro forma were analysed.

3.1 Socio – demographic characteristics of the subjects

Table 4.1 below shows the socio demographic characteristics of the subjects. The highest number of subjects 111(24.7%) were between 20 – 29 years. The mean age of the subjects was 39.3±15.4 years and the age range was between 14 to 88 years. Three hundred and two (67.1%) of the subjects were males, 207(46.0%) had secondary education, 218(48.4%) of them were unskilled and 286(63.6%) of the subjects were married.

Table 1: Socio – demographic characteristics of the subjects

Variables N = 450	Frequency	(%)
Age groups (years)		
<20	25	5.6
20 - 29	111	24.7
30 - 39	110	24.4
40 - 49	90	20.0
50 - 59	64	14.2
≥ 60	50	11.1
Sex		
Male	302	67.1
Female	148	32.9
Level of education		
No formal education	50	11.1
Primary	88	19.6
Secondary	207	46.0
Tertiary	105	23.3
Occupation		
Student	82	18.2
Unemployed	28	6.2
Unskilled	219	48.4
Semi – skilled	80	17.8
Skilled	42	9.3
Marital status		
Single	141	31.3
Married	286	63.6
Divorced	4	0.9
Widow / widower	19	4.2

3.2 Life style of the subjects

The table below depicts the life style of the subjects. Three hundred and ninety eight (88.0%) of the subjects did not smoke cigarette and 325(72.2%) of the subjects did not consume alcohol. Two hundred and thirty six (52.4%) of the subjects ingest herbal concoction while only 22(4.9%) of them use bleaching substances.

Table 2: Life style of the subjects

Variables	Frequency	(%)
N = 450		
Cigarette smoking		
Yes	52	11.6
No	398	88.4
Alcohol consumption		
Yes	125	27.8
No	325	72.2
Ingestion of herbal concoction		
Yes	236	52.4
No	214	47.6
Use of bleaching cream / soap		
Yes	22	4.9
No	428	95.1

4.3 Medical condition of the subjects

Four hundred and forty two (98.2%) of the subjects did not have family history of CKD. At presentation 271(60.2%) of the subjects had elevated systolic blood pressure and 210(46.7%) had elevated diastolic blood pressure. The mean systolic and diastolic blood pressures of the subjects at presentation were 138.2±35.5 and 86.2±23.6 respectively. Three hundred and forty four (76.4%) of the subjects were not known hypertensive, 428(95.1%) were not known diabetics. Four hundred and thirty eight (97.3%) of the subjects were HIV negative, none of them was a sickle cell patient, 444(98.7%) of them never had urinary tract infection and 439(97.6%) of the subjects did not have cancer.

Table 3: Medical condition of the subjects

Variables N = 450	Frequency	(%)
Family history of CKD		
Yes	8	1.8
No	442	98.2
Systolic blood pressure at presentation (SBP)		
Normal (≤ 120mmHg)	179	39.8
Elevated (> 120mmHg)	271	60.2
Mean SBP	138.2±35.5	
Diastolic blood pressure at presentation (DBP)		
Normal (≤ 80mmHg)	240	53.3
Elevated (> 80mmHg)	210	46.7
Mean DBP	86.2±23.6	
High blood pressure		
Yes	106	23.6
No	344	76.4
Diabetes mellitus		
Yes	22	4.9
No	428	95.1
HIV status		
Yes	12	2.7
No	438	97.3
Urinary tract infection		
Yes	7	1.6
No	443	98.4
Cancers		
Yes	13	2.9
No	437	97.1

4.4 Use of drugs and diet in the subjects

Three hundred and forty eight (77.3%) of the subjects did not engage in regular use of Non-steroidal anti-inflammatory drug (NSAIDs). There was history of chronic use of analgesics in 106(23.6%) of the subjects. About 329(73.1%) of the subjects did not engage in addition of table salt to already cooked food and 447(99.3%) did not engage in consumption of can food.

Table 4: Use of drugs and diet in the subjects

Variables	Frequency	(%)
N =450		
Regular use of NSAIDs		
Yes	102	22.7
No	348	77.3
Chronic use of analgesics		
Yes	106	23.6
No	344	76.4
Addition of table salt to cooked food		
Yes	121	26.9
No	329	73.1
Consumption of can food		
Yes	3	0.7
No	447	99.3

4.5 Proportion of subjects with ESRD and treatment outcome of the subjects

Fifty eight (12.9%) of the cases were on dialysis. Four hundred and seven (90.4%) of the subjects were alive while 43(9.6%) of the subjects were dead.

Table 5: Proportion of cases on dialysis and treatment outcome of the subjects

Variables N = 450	Frequency	(%)
Patient on dialysis		
Yes	58	12.9
No	392	87.1
Treatment outcome		
Alive	407	90.4
Dead	43	9.6

4.6 Distribution of cases and controls by socio demographic characteristics

Table 6 shows the distribution of the subjects by cases and controls and their socio demographic characteristics. There were 150 cases and 300 controls in the study. The mean age of the cases and controls were 40.7±14.4 years and 38.5±15.7 years, respectively. One hundred and thirty two (88.0%) of the cases and 268(89.3%) of the controls were age less than 60 years, the odds of being age <60 was lesser among the cases of CKD compared with the controls (OR-0.88, CI-0.47-1.62). There was no statistically significant difference between the mean age of cases and controls (t=1.660; p=0.098). Ninety (60%) of the cases were males as well as 212(70.7%) of the controls, the odds of being a male was lesser among the cases of CKD compared with the controls (OR-0.62, CI-0.41-0.94)

One hundred and twenty one (80.7%) of the cases and 224(74.7%) of the controls had education lower than tertiary. Cases of CKD were 42% more likely to have education lower than tertiary compared with the controls (OR-1.42, CI-0.88-2.29). One hundred and thirty four (89.3%) and 274(91.3%) of the cases and controls were unskilled, the odds of being unskilled was lesser among the cases of CKD compared with the controls (OR-0.80, CI-0.41-1.53). Forty two (28.0%) of the cases and 122(40.7%) of the controls were unmarried. Chronic kidney disease patients were 43% less likely to be unmarried compared with the controls (OR-0.57, CI-0.37-0.87).This was statistically significant (x^2= 6.927; p= 0.008).

Table 6: Distribution of cases and controls by socio demographic characteristics

Variables	Subjects		Total (%)	Test statistic	P - value
Age (years)	**Cases**	**Controls**			
<60	132(88.0)	268(89.3)	400(88.9)		
≥60	18(12.0)	32(10.7)	50(11.1)	X^2=0.180	0.671
Mean age	40.7±14.4	38.5±15.7		t=1.660	0.098
Sex					
Male	90(60.0)	212(70.7)	302(67.1)		
Female	60(40.0)	88(29.3)	148(32.9)	X^2=5.155	0.023
Education					
Lower education	121(80.7)	224(74.7)	345(76.7)		
Higher education	29(19.3)	76(25.3)	105(23.3)	X^2=2.012	0.156
Occupation					
Unskilled	134(89.3)	274(91.3)	408(90.7)		
Skilled	16(10.7)	26(8.7)	42(9.3)	X^2=0.473	0.492
Marital status					
Unmarried	42(28.0)	122(40.7)	164(36.4)		
Married	108(72.0)	178(59.3)	288(63.6)	X^2=6.927	0.008*

*Significant at 5% level of significance. Lower education = no education, primary and secondary education; higher education= tertiary education; unskilled = unemployed, student, semi-skilled; unmarried = single, divorced and widow/ widower.

Table 6: Distribution of cases and controls by socio demographic characteristics

Variables	Subjects		Total (%)	Test statistic	P - value
Age (years)	**Cases**	**Controls**			
<60	132(88.0)	268(89.3)	400(88.9)		
≥60	18(12.0)	32(10.7)	50(11.1)	X^2=0.180	0.671
Mean age	40.7±14.4	38.5±15.7		t=1.660	0.098
Sex					
Male	90(60.0)	212(70.7)	302(67.1)		
Female	60(40.0)	88(29.3)	148(32.9)	X^2=5.155	0.023
Education					
Lower education	121(80.7)	224(74.7)	345(76.7)		
Higher education	29(19.3)	76(25.3)	105(23.3)	X^2=2.012	0.156
Occupation					
Unskilled	134(89.3)	274(91.3)	408(90.7)		
Skilled	16(10.7)	26(8.7)	42(9.3)	X^2=0.473	0.492
Marital status					
Unmarried	42(28.0)	122(40.7)	164(36.4)		
Married	108(72.0)	178(59.3)	288(63.6)	X^2=6.927	0.008*

*Significant at 5% level of significance. Lower education = no education, primary and secondary education; higher education= tertiary education; unskilled = unemployed, student, semi-skilled; unmarried = single, divorced and widow/ widower.

4.7 Distribution of cases and controls by life style

The table below shows the association between the subjects (cases and controls) and their life style. Nineteen (12.7%) of the cases and 33(11.0%) of the controls smoke cigarette, the odds of exposure to cigarette smoking was 17% higher among the cases of CKD compared with the controls (OR-1.173, CI-0.643-2.142). The mean numbers of sticks smoked / day among the cases was 6.6±4.8 and among the controls was 1.9±1.0. There was a significant difference in the mean of sticks smoked / day between the cases and the controls (t = 4.265; p-value < 0.001). Fifty two (34.7%) cases and 73(24.3%) controls drink alcohol. Chronic kidney disease patients were almost 2 times more likely to consume alcohol compared with the controls (OR-1.66, CI-1.08-2.53). There was a statistically significant association in the mean difference of bottle drank / day between the cases and the controls (t = 3.100; p-value = 0.003). The mean numbers of bottle drank / day among the cases (3.7±4.1) almost double that among the controls (1.9±1.1).

One hundred and thirty (86.7%) of the cases and 106 (35.3%) of the controls ingest herbal concoction, respectively. Cases of CKD were 12 times more likely to ingest herbal concoction compared with the controls (OR-11.90, CI-7.02-20.15). Ingestion of herbal concoction was statistically significantly more among the cases compared with the controls (x^2 = 105.657; p-value < 0.001). Use of bleaching substances was recorded among 20(13.3%) of the cases and 2(0.7%) of the controls, the odds of use of bleaching substances was higher among the cases of CKD compared with the controls (OR-22.92, CI-5.28-99.51). This was statistically significant (x^2= 34.505; p-value < 0.001).

Table 7: Distribution of cases and controls by life style

Variables	Subjects		Total	Test statistic	p-value
Cigarette smoking	**Cases n (%)**	**Controls n (%)**	**n (%)**		
Yes	19(12.7)	30(11.0)	52(11.6)		
No	131(87.3)	267(89.0)	398(88.4)	X^2= 0.272	0.602
Mean of sticks/ day	6.6 ± 4.8	1.9 ± 1.0		t = 4.265	<0.001*
Alcohol consumption					
Yes	52(34.7)	73(24.3)	125(27.8)		
No	98(65.3)	227(75.7)	325(72.2)	X^2=5.322	0.021*
Mean of bottles / day	3.7 ± 4.1	1.9 ± 1.2		t =3.100	0.003*
Ingestion of herbal concoction					
Yes	130(86.7)	126(42.0)	256(56.9)		
No	20(13.3)	174(58.0)	194(43.1)	X^2=105.657	<0.001*
Use of bleaching substances					
Yes	20(13.3)	2(0.7)	22(4.9)		
No	130(86.7)	298(99.3)	428(95.1)	X^2=34.505	<0.001*

*Significant at 5% level of significance

4.8 Distribution of cases and controls by medical condition

Table 8 below shows that 8(5.3%) of the cases had family history of CKD while none 0(0.0%) of the control had similar history, This was statistically significant (x^2= 16.290; p-value < 0.001).The result of blood pressure of the subjects at presentation shows that cases 131(87.3%) with elevated systolic blood pressure (SBP) were statistically significantly more than the controls 121(40.3%), (x^2= 89.651; p-value <0.001), cases of CKD were 10 times more likely to have elevated SBP compared with the controls (OR-10.20,CI-5.98-17.39). The mean SBP of the cases was 168.2±37.7 and that of the controls was 123.2±22.4. The mean difference was significant (t = 13.501; p<0.001). One hundred and thirteen (75.3%) of the cases and 72(24.0%) of the controls had elevated diastolic blood pressure (DBP). Chronic kidney disease patients were 10 times more likely to have elevated DBP compared with the controls (OR-9.67,CI-6.13-15.26). This was significant (x^2=108.844; p<0.001). The mean DBP of the cases was 105±28.6 and that of the controls was 76.4±12.8.

The number of cases 90(60%) with high blood pressure was significantly more than the number of controls 106(23.6%), (x^2=165.961; p-value <0.001). Cases of CKD were 27 times more likely to have high blood pressure compared with the controls (OR-26.63, CI-14.69-48.53). There were more cases 17(11.3%) with diabetic mellitus compared with the controls 5(1.7%), this was also significant (x^2=20.096; p-value < 0.001), the odds of presence of diabetes mellitus were higher among the cases of CKD compared with the controls (OR-7.54, CI-2.73-20.87). Ten (6.7%) of the cases were HIV positive compared with 2(0.7%) of the controls. Chronic kidney disease patients were 11 times more likely to have positive HIV status compared with the controls (OR-10.64,CI-2.30-49.22), this was also significant (x^2=13.870; p-value <0.001). Cases 6(4.0%) with history of urinary tract infection were significantly more than the controls 1(0.3%), (x^2=8.779; p-value =0.006). Cases of CKD were 12 times more likely to have history of UTI compared with the controls (OR-12.46,CI-1.49-104.45). Eleven (7.3%) of the cases had cancers compared with 2(0.7%) of the controls, this was significant (x^2=15.842; p-value <0.001). The odds of presence of cancer were higher among the cases of CKD compared with the controls (OR-11.79, CI-2.58-53.91).

Table 8: Distribution of cases and controls by medical condition

Variables	Subjects		Total n (%)	Test statistic	p-value
	Cases (%)	Controls(%)			
Systolic bld pressure (SBP) at presentation					
Elevated (>120mmHg)	131(87.3)	121(40.3)	252(56.0)		
Normal (≤120mmHg)	19(12.7)	179(59.7)	198(44.0)	x^2=89.651	<0.001*
Mean SBP	167.0±40.0	130.3±30.5	142.5±38.0	t=13.501	<0.001*
Diastolic bld pressure (DBP) at presentation					
Elevated (>80mmHg)	113(75.3)	72(24.0)	185(41.1)		
Normal (≤80mmHg)	37(24.7)	228(76.0)	265(58.9)	x^2= 108.844	<0.001*
Mean DBP	105±28.6	81±18.8	89.0±28.2	t= 12.466	<0.001*
Family history of CKD					
Yes	8(5.3)	0(0.0)	8(1.8)		
No	142(94.7)	300(100.0)	442(98.2)	x^2=16.290	<0.001*
High blood pressure					
Yes	90(60.0)	16(5.3)	106(23.6)		
No	60(40.0)	284(94.7)	344(76.4)	x^2= 165.961	<0.001*

*Significant at 5% level of significance

Table 8: Distribution of cases and controls by medical condition

Variables	Subjects		Total n (%)	Test statistic	p-value
	Cases (%)	Controls(%)			
Systolic bld pressure (SBP) at presentation					
Elevated (>120mmHg)	131(87.3)	121(40.3)	252(56.0)		
Normal (≤120mmHg)	19(12.7)	179(59.7)	198(44.0)	x^2=89.651	<0.001*
Mean SBP	167.0±40.0	130.3±30.5	142.5±38.0	t=13.501	<0.001*
Diastolic bld pressure (DBP) at presentation					
Elevated (>80mmHg)	113(75.3)	72(24.0)	185(41.1)		
Normal (≤80mmHg)	37(24.7)	228(76.0)	265(58.9)	x^2= 108.844	<0.001*
Mean DBP	105±28.6	81±18.8	89.0±28.2	t= 12.466	<0.001*
Family history of CKD					
Yes	8(5.3)	0(0.0)	8(1.8)		
No	142(94.7)	300(100.0)	442(98.2)	x^2=16.290	<0.001*
High blood pressure					
Yes	90(60.0)	16(5.3)	106(23.6)		
No	60(40.0)	284(94.7)	344(76.4)	x^2= 165.961	<0.001*

*Significant at 5% level of significance

Table 9: Distribution of cases and controls by medical condition (cont)

Variables	Subjects		Total n (%)	Test statistic	p-value
	Cases n(%)	Controls(%)			
Diabetes mellitus					
Yes	17(11.3)	5(1.7)	22(4.9)		
No	133(88.9)	295(98.3)	428(95.1)	x^2=20.096	< 0.001*
HIV status					
Yes	10(6.7)	2(0.7)	12(2.7)		
No	140(93.3)	298(99.3)	438(97.3)	x^2= 13.870	< 0.001*
Urinary tract infection					
Yes	6(4.0)	1(0.3)	7(1.6)		
No	144(96.0)	299(99.7)	443(98.4)	x^2=8.779;	0.006*
Cancers					
Yes	11(7.3)	2(0.7)	13(2.9)		
No	139(92.7)	298(99.3)	437(97.1)	x^2=15.842	< 0.001

*Significant at 5% level of significance

4.9 Distribution of cases and controls by use of drugs and diet

Regular use of non- steroidal anti-inflammatory drugs (NSAIDs) had been identified as a risk factor of CKD. Number of cases 94(62.7%) on regular use of NSAIDs were statistically significantly more than the number of controls 8(2.7%), (x^2=205.375; p< 0.001). The odds of regular use of NSAIDs were higher among the cases of CKD compared with the controls (OR-61.27, CI-28.19-133.17). Ninety eight (64.0%) had history of chronic use of analgesic compared with 10(3.3%) of the controls, the odds of chronic use of analgesic were higher among the cases of CKD compared with the controls (OR-51.56, CI-25.27-105.19). This was significant, (x^2=204.391; p-value < 0,001). History of addition of salt to cooked food prior consumption was statistically significantly more in cases 92(61.3%) compared with controls 29(9.7%), (x^2=135.789; p<0.001). The odds of addition of salt to cooked food prior consumption were higher among the cases of CKD compared with the controls (OR-14.82, CI-8.95-24.55). Consumption of can food was significant among the cases 3(2.0%) and controls 0(0.0%), (x^2=3.153; p=0.037).

4.9 Distribution of cases and controls by use of drugs and diet

Regular use of non- steroidal anti-inflammatory drugs (NSAIDs) had been identified as a risk factor of CKD. Number of cases 94(62.7%) on regular use of NSAIDs were statistically significantly more than the number of controls 8(2.7%), (x^2=205.375; p< 0.001). The odds of regular use of NSAIDs were higher among the cases of CKD compared with the controls (OR-61.27, CI-28.19-133.17). Ninety eight (64.0%) had history of chronic use of analgesic compared with 10(3.3%) of the controls, the odds of chronic use of analgesic were higher among the cases of CKD compared with the controls (OR-51.56, CI-25.27-105.19). This was significant, (x^2=204.391; p-value < 0,001). History of addition of salt to cooked food prior consumption was statistically significantly more in cases 92(61.3%) compared with controls 29(9.7%), (x^2=135.789; p<0.001). The odds of addition of salt to cooked food prior consumption were higher among the cases of CKD compared with the controls (OR-14.82, CI-8.95-24.55). Consumption of can food was significant among the cases 3(2.0%) and controls 0(0.0%), (x^2=3.153; p=0.037).

Table 10: Distribution of cases and controls by use of drugs and diet

Variables	Subjects		Total n (%)	Test statistic	p-value
	Cases n (%)	Controls n (%)			
Regular use of NSAIDs					
Yes	94(62.7)	8(2.7)	102(22.7)		
No	56(37.3)	292(97.3)	348(77.3)	x^2=205.375	< 0.001*
Chronic use of analgesics					
Yes	98(64.0)	10(3.3)	106(23.6)		
No	54(36.0)	290(96.7)	344(76.4)	x^2=204.391	<0.001*
Addition of table salt to cooked food					
Yes	92(61.3)	29(9.7)	121(26.9)		
No	58(38.7)	271(90.3)	329(73.1)	x^2=135.789;	<0.001*
Consumption of can food					
Yes	3(2.0)	0(0.0)	3(0.7)		
No	147(98.0)	300(100.0)	447(99.3)	x^2=6.040	0.037*

*Significant at 5% level of significance

4.10 Proportion of cases and controls on dialysis

Fifty seven (38%) out of the 150 cases had dialysis compared with 1(0.3%) out of the 300 controls who also had dialysis. Among the cases, there were 90 males and 60 females, 36(63.2%) out of the 90 males had dialysis and 21(36.8%) out of the 60 females had dialysis, this was shown in figure 4.1. Regarding the treatment outcome of the cases and controls, one hundred and eight (72.0%) of the cases were alive while 299(99.7%) of the controls were alive, this was shown in figure 4.2. Case fatality rate was higher among the cases compared with the controls, the case fatality rate among the cases was 28% while that of the controls was 0.3%. Figure 4.3 shows the type of kidney disease among the cases, two-third 100(66.5%) of the cases had kidney diseases while the remaining one-third 50(33.5%) of the cases had other conditions such as HIV, UTI, cancer, family history of CKD and use of bleaching substances. Forty –nine (32.5%) of the cases had hypertensive nephropathy, 20(13.3%) had chronic glomerulonephritis (CGN), 12(8%) had diabetic nephropathy, 11(7.3%) had interstitial tubulonephritis and 8(5.3%) had nephrotic syndrome.

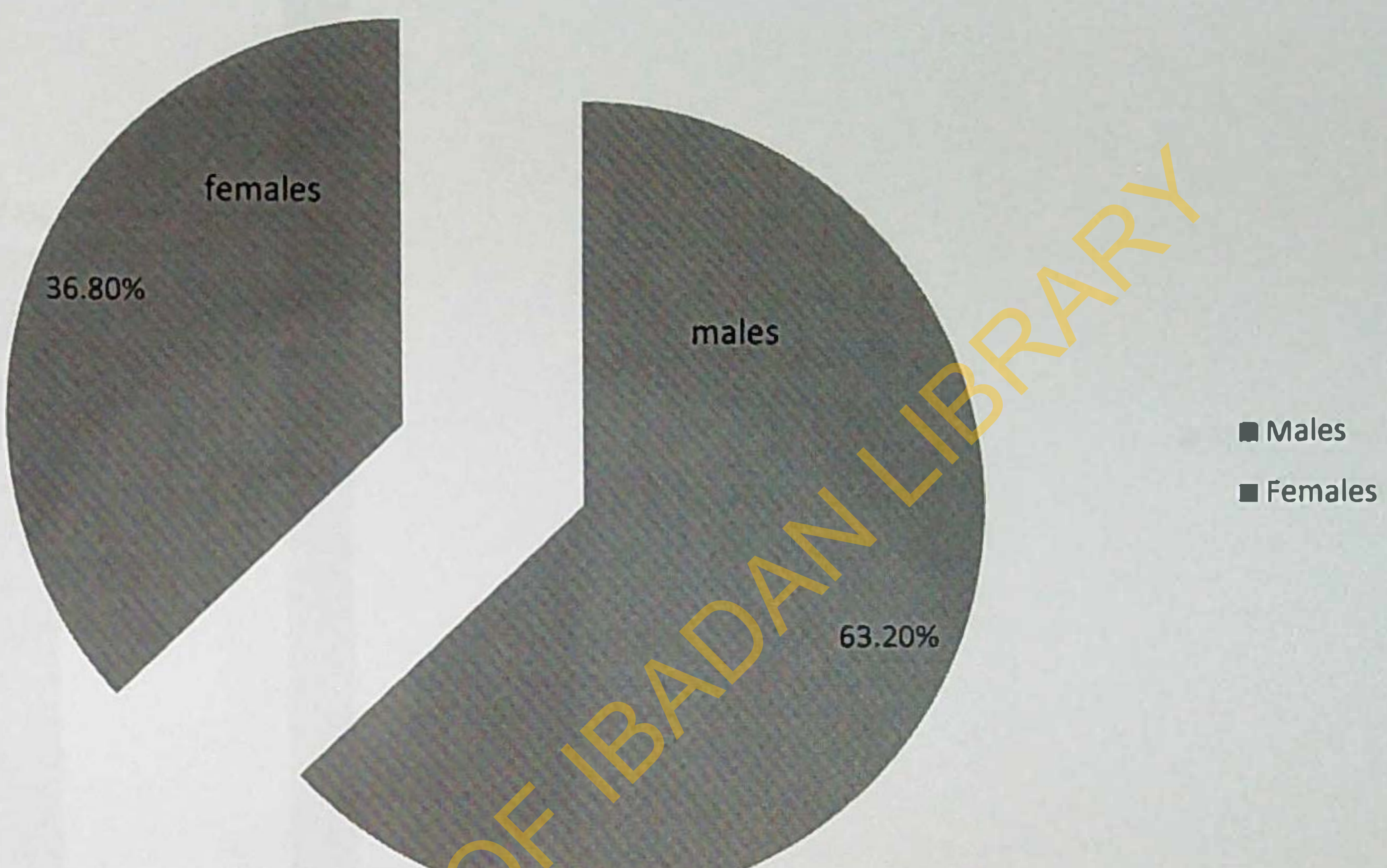

Figure 4.1: Sex distribution of cases on dialysis

Figure 4.2: Treatment outcome of the cases and controls

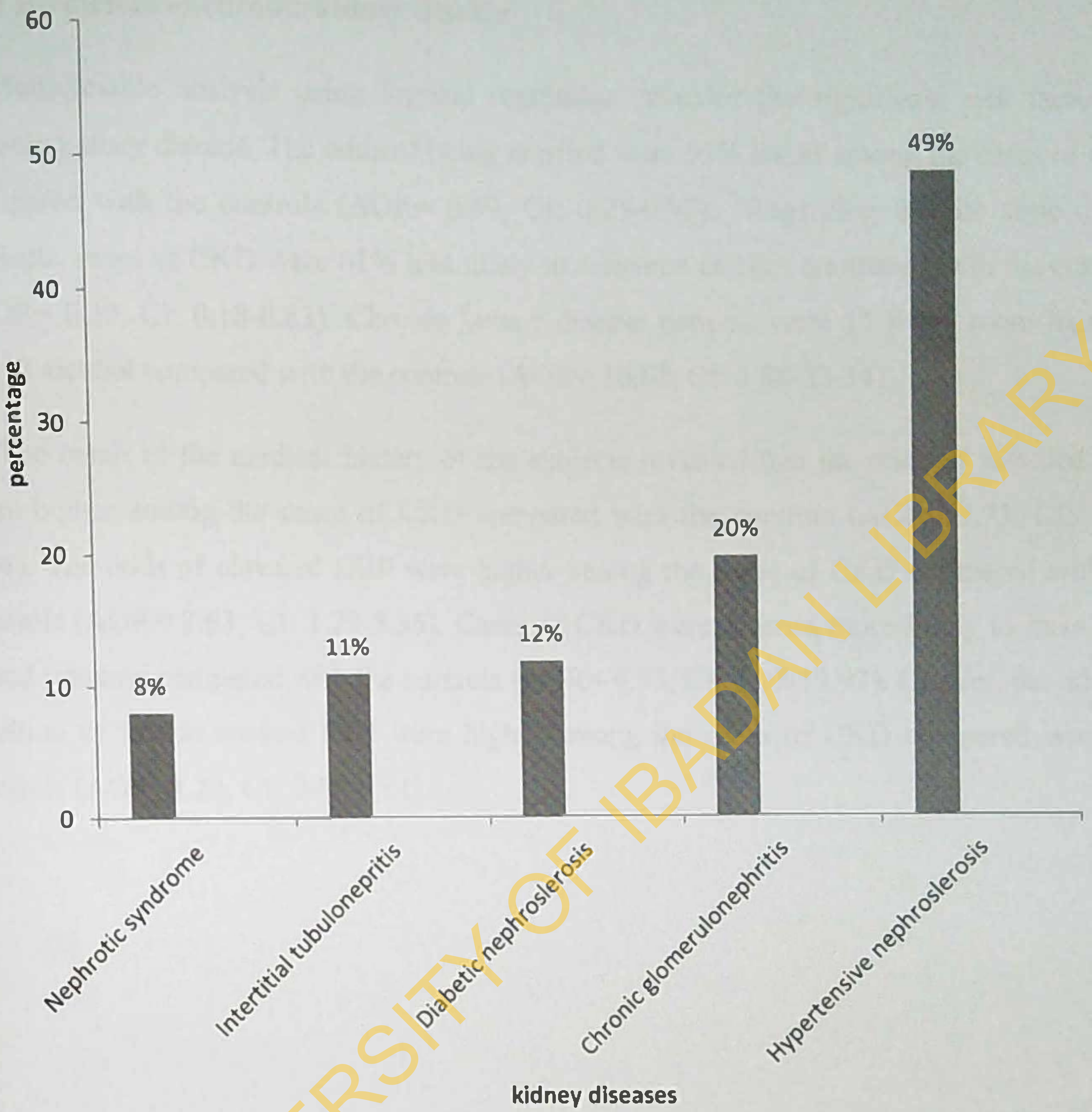

Figure 4.3: Distribution of kidney disease among cases of CKD

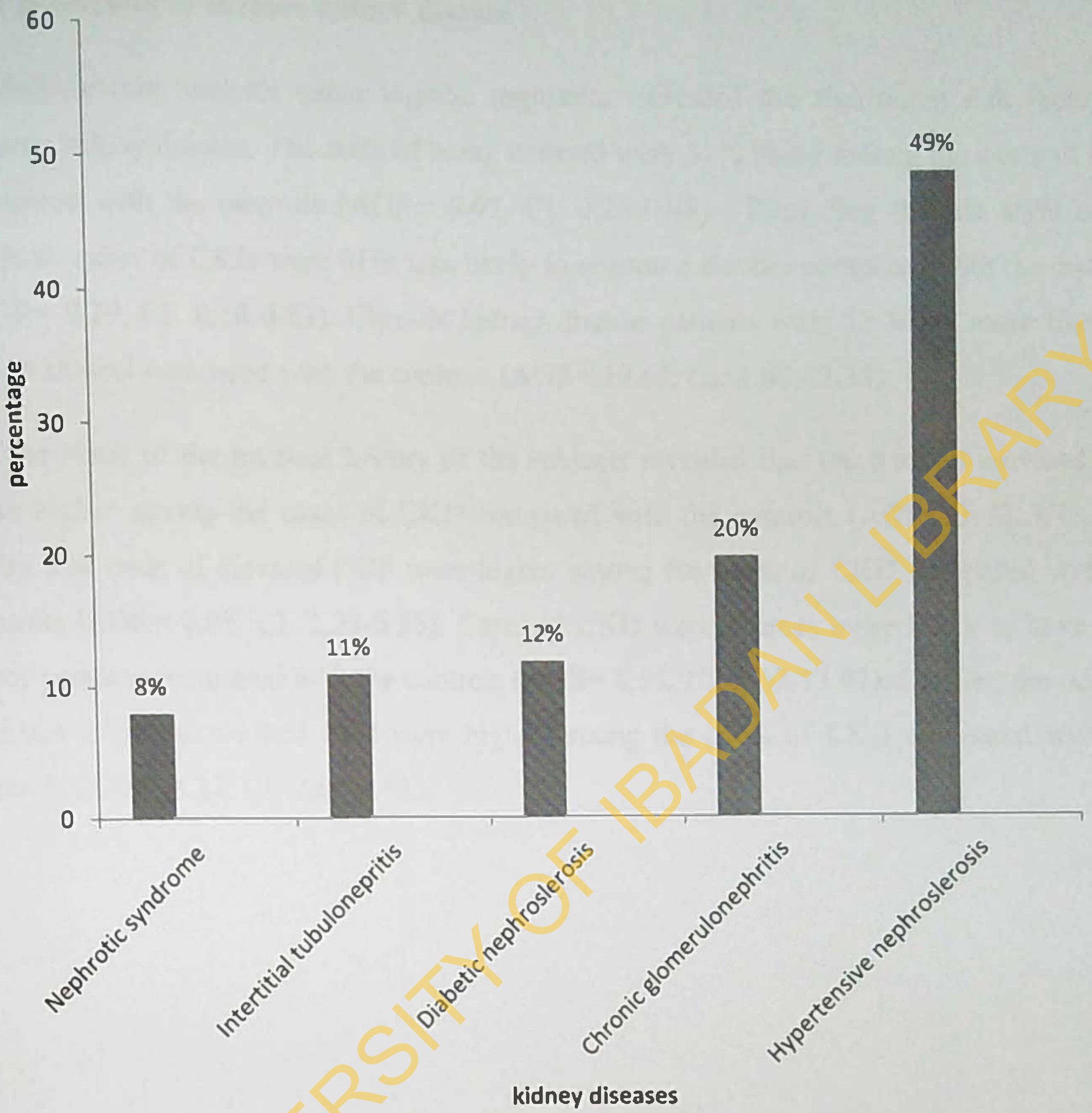

Figure 4.3: Distribution of kidney disease among cases of CKD

4.11 Predictors of chronic kidney disease

Multivariable analysis using logistic regression revealed the significant risk factors of chronic kidney disease. The odds of being married were 51% lesser among the cases of CKD compared with the controls (AOR= 0.49, CI: 0.25-0.98). Regarding the life style of the subjects, cases of CKD were 61% less likely to consume alcohol compared with the controls (AOR= 0.39, CI: 0.18-0.83). Chronic kidney disease patients were 11 times more likely to ingest alcohol compared with the controls (AOR= 10.68, CI: 4.88-23.34).

The result of the medical history of the subjects revealed that the odds of elevated SBP were higher among the cases of CKD compared with the controls (AOR= 3.73, CI: 1.72-8.08). The odds of elevated DBP were higher among the cases of CKD compared with the controls (AOR= 2.63, CI: 1.29-5.35). Cases of CKD were 6 times more likely to have high blood pressure compared with the controls (AOR= 6.55, CI: 3.07-13.97). On diet, the odds of addition of salt to cooked food were higher among the cases of CKD compared with the controls (AOR=4.22, CI:-2.07-8.61).

Table 11: Predictors of chronic kidney diseases

Variables	Odd – ratio	95% Confidence Interval		P – value
		Lower	Upper	
Sex				
Male	0.85	0.44	1.64	0.620
Female	1			
Marital status				
Unmarried	1			
Married	0.49	0.25	0.98	0.045*
Alcohol consumption				
Yes	0.39	0.18	0.83	0.014*
No	1			
Ingestion of herbal concoction				
Yes	10.68	4.88	23.34	<0.001*
No	1			
SBP at presentation				
Elevated	3.73	1.72	8.08	0.001*
Normal	1			
DBP at presentation				
Elevated	2.63	1.29	5.35	0.008*
Normal	1			
High blood pressure				
Yes	6.55	3.07	13.97	<0.001*
No	1			
Diabetes mellitus				
Yes	2.85	0.75	10.85	0.125
No	1			
Addition of salt to cooked food prior consumption				
Yes	4.22	2.07	8.61	<0.001*
No	1			

*Significant at 5% level of significance

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATION

5.1 Discussion

5.1.1 Risk factors of chronic kidney disease

The mean age of the cases was 40.7±14.4 years while that of the controls was 38.5±15.7 years and most of the cases and controls were less than 60years of age, a finding that is consistent with findings from similar study within and outside Nigeria where mean age of patient with CKD was 42±15.43 years (Ulasi I. I and Ijoma C. K, 2010, Yacoub R et al., 2010, Shittu AO et al., 2013, Alebiosu C O et al., 2006). But different from a similar studies from India where the mean age was 45.22±15.2 (Jerime A et al., 2002) , Ogbomosho where the mean age of CKD patients was 50.52± 13.03 years and majority of the patients were ≥ 45 years (Afolabi MO et al., 2009) and another study from USA where the mean age was 62 years. Majority (24.7% and 24.4%) of the subjects were within the age range of 20-29 and 30-39, then 40-49 and 50-59, this is consistent with study from Ilorin (Chijioke A et al., 2010) but different from study from Ogbomosho (Afolabi M.O et al., 2009). Most of these patients are in their productive age, this will definitely affect the economy of the country. Most of the subjects (both the cases and controls) were males, a finding that is consistent with similar study in Sagamu where more of the subjects were males (Alebiosu C O et al., 2006), however the finding is different from similar study in Ogbomosho where most cases were females (Afolabi M.O et al., 2009).

Majority of the cases had secondary education, followed by those with no education. This can explain the inadequacy in the knowledge and awareness of CKD and its risk factors on the part of the cases regarding their life style. This had been documented in other study (Alebiosu C.O, 2002b). About half of the cases were unskilled, this is consistent with result of similar study in Ogbomosho where majority of the cases were unskilled (Afolabi M.O et al., 2009). Over (70%) of the cases were married, this finding is consistent with similar study where most of the cases were married (Afolabi M.O et al., 2009).

More than two third of the subjects never smoked cigarette and neither do they consume alcohol, this is consistent with a similar study in Nigeria (Afolabi M.O et al., 2009) and also a similar study in the USA (Vupputuri S and Sandler D P, 2003). However there was a significant difference between the mean sticks of cigarette smoked per day between the cases

and controls and the means of bottles of alcohol consumed per day between the cases and controls. A Large percentage of the cases ingest herbal concoction, this could be attributed to our socio-cultural belief and life styles, and it could also be as a result of the state of the economy in the country. It is generally believed by the less educated and the unskilled population in Nigeria that it is more expensive to go to the hospital for treatment if you are sick compared with use of herbal concoction, this is consistent with similar study in Nigeria (Afolabi MO et al., 2009). In addition to these, more of the cases use bleaching substances compared with the control. This is because these people are ignorant of the content of this cream/soap and the damage they can do. Furthermore, World Health Organisation (WHO) had revealed that 77% of Nigeria women, the highest in the world use skin lightening cream on regular basis. These bleaching substances contain mercury which damages the skin and the kidney of the user.

Higher proportion of the cases had family history of CKD compared with the controls. Most of the cases had elevated systolic and diastolic blood pressure at presentation. More than half of these cases were known hypertensive. The reason for this could be as a result of our attitude towards our health. Most Nigerians do not do routine medical check-up and by the time they are finding out that they have one chronic disease or the other, complications already set in. The mean presenting systolic and diastolic blood pressure for the case were 167.0±40.0mmHg and 130.3±30.5mmHg respectively, a finding that is consistent with result of similar study from Sagamu, Ogun-State (Alebiosu C O et al., 2006) and that of the controls were 105±28.6mmHg and 81±18.8mmHg. More of the cases compared with the controls had high blood pressure and diabetes mellitus.

More of the cases than the controls were HIV positive. This is because HIV reduces body immunity and can lead to several organs damage. All these risk factors were statistically significant. These findings are consistent with result of similar study from USA (Vupputuri S and Sandler D P, 2003). Neither the cases nor the controls had sickle cell disease, more of the cases compared with the controls had history of urinary tract infection. Urinary tract infection alone may not cause chronic kidney disease if well treated. But if the UTI is not well treated, if the UTI become recurrent, if present in a pregnant woman, in a diabetic, if the patient had UTI and sexually transmitted infection, if the patient had UTI that is not properly treated and also have multiple sexual partners and if the patient had urinary tract abnormalities. All this may cause scarring in the kidneys which can lead to chronic kidney diseases. More of the

and controls and the means of bottles of alcohol consumed per day between the cases and controls. A Large percentage of the cases ingest herbal concoction, this could be attributed to our socio-cultural belief and life styles, and it could also be as a result of the state of the economy in the country. It is generally believed by the less educated and the unskilled population in Nigeria that it is more expensive to go to the hospital for treatment if you are sick compared with use of herbal concoction, this is consistent with similar study in Nigeria (Afolabi MO et al., 2009). In addition to these, more of the cases use bleaching substances compared with the control. This is because these people are ignorant of the content of this cream/soap and the damage they can do. Furthermore, World Health Organisation (WHO) had revealed that 77% of Nigeria women, the highest in the world use skin lightening cream on regular basis. These bleaching substances contain mercury which damages the skin and the kidney of the user.

Higher proportion of the cases had family history of CKD compared with the controls. Most of the cases had elevated systolic and diastolic blood pressure at presentation. More than half of these cases were known hypertensive. The reason for this could be as a result of our attitude towards our health. Most Nigerians do not do routine medical check-up and by the time they are finding out that they have one chronic disease or the other, complications already set in. The mean presenting systolic and diastolic blood pressure for the case were 167.0±40.0mmHg and 130.3±30.5mmHg respectively, a finding that is consistent with result of similar study from Sagamu, Ogun-State (Alebiosu C O et al., 2006) and that of the controls were 105±28.6mmHg and 81±18.8mmHg. More of the cases compared with the controls had high blood pressure and diabetes mellitus.

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of CKD were hypertensive nephrosclerosis, diabetic nephrosclerosis and chronic glomerulonephritis, this finding is consistent with similar study from OOUTH, Sagamu, Nigeria (Alebiosu C O et al., 2006) and (National Institute of Diabetes & Digestive & Kidney Diseases website, 2010).

5.1.3 Proportion of chronic kidney disease patient with End Stage Renal Disease

More of the male gender had dialysis compared with the female gender, a finding consistent with similar studies (Arije A et al., 2000, Fresenins medical care, 2000). This finding is also consistent with result from a study in India where it was revealed that patients with CKD were more likely to be male, (Singh AK et al., 2013).

5.1.4 Case fatality rate of chronic kidney disease

There were more survivors in the controls compared with the cases. There are about (28%) deaths (case fatality rate) in the cases, a finding lower than result of a study in OOUTH Sagamu where the case fatality rate of CKD was 55% (Ogun S.A et al., 2000), while that of the controls was only (0.3%) deaths, the case fatality was more in the cases than in the controls. This is because if adequate care is not given to a CKD patient, it can result into ESRD and if care is not taken, death of the patient will be inevitable especially in a developing country like Nigeria.

5.2 Limitations

Some of the case files were missing, this lead to recruitment of new case files and some important information were missing in some of the case files available. Some information was not properly documented. Some important information such as the weight, the height and the body mass index (BMI) were not available in some case files so risk factor such as obesity could not be analysed. Information used for this study was information written by physicians from the two clinics /wards based on the presenting complaint of the patient, so a degree of biased reporting is possible. The study was carried out in one hospital in Ogun State and the study was a retrospective study, hence findings from this study might not be generalised.

5.3 Conclusion

Findings from this study revealed that most of CKD patients were males in their productive age, this may affect the economic growth of the country. Majority were unskilled and semi-skilled workers with secondary and no formal education, this is why some of the risk factors of CKD were practised by the people ignorantly. The proportion of CKD patients with ESRD was high and the case fatality rate of CKD was also high. Significant risk factors predicting CKD in this study were marital status, alcohol consumption, ingestion of herbal concoction, elevated systolic and diastolic blood pressure at presentation, history of high blood pressure, positive and addition of salt at the table.

5.4 Recommendations

1. Government should assist in the management of CKD when it is diagnosed in order to prevent it from getting to ESRD.
2. Individuals should cultivate the habit of doing routine regular medical check and avail themselves the opportunity of using the screening test available such as Pap smear and visual inspection using acetic acid (VIA) for cancer of the cervix, self-breast examination and mammogram for breast cancer and HIV counselling and testing. Individual with family history of CKD, hypertension and diabetes mellitus should regularly check their blood electrolyte, urea and creatinine, blood sugar level and blood pressure.
3. In addition, patients that had been diagnosed to be hypertensive or diabetic or both should cultivate the habit of good drug compliance, so that their disease state will be controlled and complication will be prevented or delayed.
4. Individual should disengage from a bad culture of use of herbal concoction, use of self-drug medication and abuse of some drugs just because they believe the drug is working well for them and cultivate the habit of seeing the doctors and following the doctor's prescription.
5. Some of the risk factors of CKD are modifiable, so life will be more meaningful if people can modify their life style such as stop the use of bleaching cream and soap as well as reducing their alcohol consumption.

REFERENCES

Afolabi M.O, Abioye-Kuleyi E.A, Arogundade F.A & BELLO I.S 2009. Prevalence of chronic kidney disease in a Nigeria family practice population. *SA Fam Pract,,* 51, 132-137.

Alebiosu C O, Ayodele O O, Abba S.A & Olutoyin A I 2006. Chronic renal failure at the Olabisi Onabanjo university teaching hospital, Sagamu, Nigeria. *Afric Health Sc,* 6(3), 132-138.

Alebiosu C.O 2002a. Awareness of kidney Disorders in Nigeria. *African journal of Health Science,,* 9, 3-4.

Alebiosu C.O 2002b. Awareness of kidney Disorders in Nigeria. African journal of Health Science vol 9 . Number 3-4,. *African journal of Health Science,,* 9.

Alebiosu C.O 2003a. Clinical diabetic nephropathy in a tropical African population, . *West Africa journal med,,* (22)2, 152-5.

Alebiosu C.O 2003b. An update on progression promoters in CKD,. *J . Nati med ASSOC USA,,* 95, 30-42.

Arije A, Kadiri S & Akinkugbe O.O 2000. The viability of heamodialysis as a treatment option for renal failure in developing economy. *African J. Med Sci,,* 29, 311-314.

Bamgboye E.B 2003. Haemodialysis: management problems in developing countries with Nigeria as a surrogate kid intern. 63, 593-595.

Chijioke A, Okoro E.O & Makusidi A.M 2010. Factors influencing attitude towards Kidney donation for transplantation in illnesses. *Sahel medical journal,,* 13(2), 96-101.

Ebsco Dynamed Website 2013. Chronic kidney disease. Available at: http://www.ebscohost.com/dynamed .

Fresenins Medical Care 2000. End Stage renal disease patient ;AGlobal perspective Handbook.

Hallan S I & Ortho S R 2011. Smoking is a risk factor in the progression to kidney failure. *Kidney Int.,* 80, 516-523.

Hill G S 2008. Hypertensive Nephrosclerosis. *curr opin Nephrol Hypertens.,* 3, 266-270.

Hsu CY, Bates DW, Kuperman GJ & Curhan GC 2001. Relationship between haematocrit and renal function in men and women. *Kidney Int.,* 59, 725-731.

Jerime A, Pierie Wasters R & Pierie Wasters J 2002. Recommendation for the screening and management of patient with CKD Nephrol- Dia- Transpt., 19-28.

Kinchen KS, Sadler J, Fink N, Brookmeyer R, Klag M & Levey AS 2002. The timing of specialist evaluation in chronic kidney disease and mortality. . *Ann Intern Med,,* 137, 479-486.

Kirkwood B.R & Sterne J.A.C 2003,. Essential Medical Statistics, second edition. A black well publishing company. Formulae for sample size determination. Chapter 35,. 420-421.

Levey AS, Stevens LA & Schmid CH 2009. A new equation to estimate glomerular filtration rate. . *Annals of Internal Medicine,,* 150, 604-612.

Levinsky NG 2002. Specialist evaluation in chronic kidney disease: too little, too late. . *Ann Intern Med,,* 137, 542-543.

National Institute Of Diabetes & Digestive & Kidney Diseases Website 2010. End-stage renal disease. Available at: http://www2.niddk.... .

National Kidney Foundation 2002. Clinical Practical Guidelines for Chronic kidney Disease, Evaluation, Classification and stratification. *Am J. kidney Dis,* 39, 51-52.

NKF-K/DOQI 2001. Clinical Practice Guidelines for Vascular Access: updates 2000. . *Am J Kidney Dis,,* 37, 137-181.

Odubanjo M.O, Okolo C.A, Oluwasola A.O & Arije A 2011. End stage renal disease in Nigeria : An overview of the epidemiology and the pathogenetic medicine. . *Sandi j kidney Dis Transpl,,* 22, 1064-71.

Ogun S.A, Adelowo O.O, Familoni O.B, Jaiyesimi A.E.A & Fakoya C.A.O 2000. Pattern and outcome of medical admissions at the Ogun State University Teaching Hospital Sagamu- a three year review. *West African Journal of Medicine,,* 19, 304-308.

Rashad S & Barsoum M.D 2006. Chronic Kidney Disease I in the Developing World. *New England Journal of Medicine.,* 354, 997-999.

Rodriguez JA, Armadans L & Ferrer E 2000. The function of permanent vascular access. Nephrol Dial Transplant,. 15, 402-408.

Shittu AO, Chijioke A, Biliaminu SA, Makusidi AM, Sanni MA, Abdul-Rahman MB & Abdul-Azeez IM 2013. Haematological Profile Of Patients With Chronic Kidney Disease In Nigeria. *Journal of Nephrology and Renal Transplantation,* 5(1), 2-10.

Singh AK, Farag YMK, Mittal BV, Subramanian KK, Reddy SRK, Acharya VN, Almeida AF, Channakeshavamurthy A, Ballal HS & Gaccione P 2013. Epidemiology and risk factors of chronic kidney disease in India – results from the SEEK (Screening and Early Evaluation of Kidney Disease) study. *BMC Neprology,* 14, 114.

Ulasi I. I & Ijoma C. K 2010. Enormity of CKD in Nigeria. The situation in a Teaching Hospital in South East Nigeria. *Journal of Tropical medicine,*.

Vupputuri S & Sandler D P 2003. Lifestyle risk factors and chronic kidney disease. *Annals of Epidemiology,* 13, 710-720.

Weiss FM Technical Aspect of Peritoneal Dialysis. Nephrology Secrets, 2nd Edition. Editors, Hricik DE, Miller RT, Sedor JR. Elsevier India. Chapter 50; . 191.

Wish JB Anemia associated with renal failure. Nephrology Secrets, 2nd Edition. Editors, Hricik DE, Miller RT, Sedor JR. Elsevier India. Chapter 23; . 164.

Wish JB Management of patient with progressive renal failure. Nephrology Secrets, . 171.

Yacoub R, Habib H, Lahdo A, Ali R, Varjabedian L, Atalla G, Kassis AN, N, Alkhateeb S, Alahdab S & Albitar S 2010. Association between smoking and chronic kidney disease: a case control study. Bio med central. 10, 731.

Wish JB Anemia associated with renal failure. Nephrology Secrets, 2nd Edition. Editors, Hricik DE, Miller RT, Sedor JR. Elsevier India. Chapter 43; . 164.

Wish JB Management of patient with progressive renal failure. Nephrology Secrets,. 171.

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APPENDIX

A PRO FORMA ON RISK FACTORS ASSOCIATED WITH CHRONIC KIDNEY DISEASE AMONG PATIENTS ATTENDING OLABISI ONABANJO UNIVERSITY TEACHING HOSPITAL SAGAMU, OGUN STATE.

Case notes No.....

Serial No.....

Date of diagnosis of CKD.....

Section A- Socio-demographic characteristics of the patients

1) Age in years.....
2) Sex.....
   a) Male
   b) Female
3) Level of education
   a) No education
   b) Primary
   c) Secondary
   d) Tertiary
4) Occupation
   a) Student
   b) Unemployed
   c) Unskilled
   d) Semi-skilled
   e) Skilled
5) Marital status
   a) Single
   b) Married

c) Separated

d) Divorced

e) Widow/ widower

Section B- Life style of the patients

6) Cigarette smoking?

a) Yes

b) No

7) If yes how many sticks per day ……..

8) Alcohol consumption?

a) Yes

b) No

9) If yes how many bottles per day ……

10) Ingestion of herbal concoction?

a) Yes

b) No

11) Use of bleaching cream/soap?

a) Yes

b) No

Section C- Medical history of the patients

13) Blood Pressure (at presentation)……..

14) Family history of kidney disease?

a) Yes

b) No

15) History of high blood pressure?

a) Yes

b) No

16) History of diabetes Mellitus?

a) Yes

b) No

17) HIV status

a) Positive

b) Negative

18) Sickle Cell disease?

a) Yes

b) No

19) History of urinary tract infection?

a) Yes

b) No

20) History of cancer?

a) Yes

b) No

21) Patient's type of kidney disease .....

Section D–Drugs and dietary history of the patients.

22)Use of Non -steroidal anti-inflammatory drugs?

a) Yes

b) No

23)History of chronic use of analgesics?

a) Yes

b) No

24) History of addition of salt to cooked food prior consumption?

a) Yes

b) No

25) History of consumption of Can food?

a) Yes

b) No

Section E – History of end stage renal failure and treatment outcome of the patients

26)Patient on dialysis?

a) Yes

b) No

27) Patient treatment outcome

a) Alive

b) Dead

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OOUTH-Sagamu

CERTIFICATE OF APPROVAL

RE: RISK FACTORS OF CHRONIC KIDNEY DISEASE AMONG PATIENTS ATTENDING OLABISI ONABANJO UNIVERSITY TEACHING HOSPITAL, SAGAMU OGUN STATE

I wish to inform you that following appropriate review, the OOUTH- Health Research Ethics Committee has granted you an approval to proceed on the above study for a period of one year from 23rd December, 2013 to 22nd December, 2014.

You are to note that this approval is given on the basis of your corrected Protocol. Any proposed change in the protocol should be communicated to the Committee for consideration ahead of execution.

Kindly inform the Committee when the study is to commence to facilitate monitoring by designated representative(s) of the OOUTH Health Research Ethics Committee.

Prof. P.O. Olatunji
Chairman, OOUTH-HREC