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Topic: PREVALENCE OF ACUTE RENAL FAILURE AMONG DIABETIC PATIENTS ATTENDING KIBOGORA HOSPITAL

A research paper submitted in the partial fulfillment of the requirement for the Award in Bachelor's degree with honor in Biomedical Laboratory Science

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DECLARATION

We, KAMAGAJU Consolée &UWIRINGIYIMANA Oscar hereby declare that this is our own original work and not a duplication of any similar academic work. It has therefore not been submitted to any other institution of higher learning.

All materials cited in this paper which are not our own have been duly acknowledged.

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&

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Date: ………/………/………

Declaration by the supervisor

We declare that this work has been submitted for examination with our approval as Kibogora Polytechnic supervisor

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ABSTRACT

Diabetes mellitus is the most common epidemic disorder in world population. It is a chronic medical condition, and a cross sectional descriptive study. Nowadays, diabetes has become a common disease to the mankind from the young to the old persons. The growth of the diabetic patients is increasing day-by-day either in Rwanda or all over the world, due to various causes such as bacterial or viral infection, toxic or chemical contents mix with the food, auto immune reaction, obesity, bad diet, change in lifestyle, eating habit, environmental pollution, et cetera. The prevalence of diabetes is high among US population; using US renal data system, observations have shown that the number of individuals having diabetes listed as primary diagnosis who initiated ESRD treatment between 1990 and 2006 has increased from 17727 in 19990 to 48215 in 2006. According to the diabetes Atlas the prevalence of diabetes in Rwanda is about 3.16% of the population with1918 diabetes related deaths per year.

Renal failure is one among the slowly progressive diseases of kidney function characterized generally by low glomerular filtration (GRF). The replacement therapy of renal failure by hemodialysis involves the removal of excessive toxic fluids and toxic metabolic end products from the body.

The purpose of this study was to identify the information persons with acute renal failure believed to be most important to learn, as well as whether it is realistic to learn the information while diabetic patients attended Kibogora Hospital. A survey tool was administered to 81 patients to assess their responses to acute renal failure topics in several categories including: medical information, risk factors, diet information, activity information and other pertinent issues. Due to results we recorded, the patients identified all of the categories as both important and realistic to learn.

DEDICATION

We dedicate this dissertation to:

The Almighty God, for all his blessings and protection to me

My Husband and children

Our parents, Brothers and sisters

Our fellow students and all my friends that contributed to my work

We dedicate also our supervisors from Kibogora Polytechnic and all staffs from Kibogora Hospital for their help to fulfill this research project.

May Almighty Lord be with you!

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ABREVIATIONS   AND ACRONYMS

CKD: Chronic kidney disease

GFR: Glomerular filtration rate

KAP: knowledge, attitude and practice

BUN: Blood urea nitrogen

IDDM: insulin dependent diabetes mellitus

NIDDM: Non-insulin dependent diabetes mellitus

NSAIDs: Non-steroidal anti-inflammatory drugs

ESRD: End stage renal disease

DM: Diabetes mellitus

T1DM: Type 1 diabetes mellitus

ARF: Acute renal failure

KH: Kibogora hospital

KP: Kibogora polytechnic

DN: Diabetic nephropathy

AKI: Acute kidney injury

DEFINITIONS OF KEY TERMS

Acute kidney disease also known as acute kidney failure occurs when your kidneys suddenly become unable to filter waste products from your blood. When your kidneys lose their filtering ability, dangerous levels of wastes may accumulate, and your blood's chemical makeup may get out of balance.(National Library of Medicine. 1 January2013.)

Chronic kidney disease: It is also called chronic kidney failure, and it describes the gradual loss of kidney function. Your kidneys filter wastes and excess fluids from your blood, which are then excreted in your urine. When CKD reaches an advanced stage, dangerous levels of fluid, electrolytes and wastes can build up in your body.(HansFululand; Uppsala University; 2005)

Diabetes mellitus (DM): is a chronic disease caused by inherited or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced. Such a deficiency results in increased concentrations of glucose in the blood, which in turn damage many of the body's systems, in particular the blood vessels and nerves.
There are two forms of diabetes:

- **Type 1** diabetes (formerly known as insulin-dependent) in which the pancreas fails to produce the insulin which is essential for survival. This form develops most frequently in children and adolescents, but is being increasingly noted later in life.

- **Type 2** diabetes (formerly named non-insulin-dependent) which results from the body's inability to respond properly to the action of insulin produced by the pancreas. Type 2 diabetes is much more common and accounts for around 90% of all diabetes cases worldwide. It occurs most frequently in adults, but is being noted increasingly in adolescents as well. (World Health Organization. Archived from the original on 31 March 2014. Retrieved 4 April 2014.)

Diabetic nephropathy: Diabetic nephropathy is a significant cause of chronic kidney disease and end-stage renal failure.

Diabetic nephropathy (DN) or diabetic kidney disease is a syndrome characterized by the presence of pathological quantities of urine albumin excretion, diabetic glomerular lesions, and loss of glomerular filtration rate (GFR) in diabetics. (Satko SG, Langefeld CD, Daeihagh P, Bowden DW, Rich SS, Freedman BI,2002)

Glomerular filtration rate (GFR): is the best test to measure your level of kidney function and determine your stage of kidney disease. If your GFR number is low, your kidneys are not working as well as they should and the disease is detected.(Scandinavian journal of clinical and laboratory investigation,1986).

Dialysis: is a treatment that removes wastes and excess fluid from the patients' blood.(Emmanuel Disse, Charles ThivoletDiabets care 2004)

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CHAPTER ONE: GENERAL INTRODUCTION

1.0. Introduction

Diabetic patients with chronic kidney disease (CKD), as defined by a reduced glomerular filtration rate (GFR) are at greater risk for cardiovascular and renal events and mortality. Type 1 diabetes mellitus or T1DM once known as juvenile diabetes or insulin-dependent –diabetes is a chronic condition in which the pancreas produces little or no insulin. A hormone needed to allow glucose to enter cells to produce energy. The glucose is the main type of sugar in the blood that comes from the foods we eat, and is the major source f energy for the body's functions. Without insulin glucose can't get into cells and so it stays in the blood stream. Hypoglycemia is a low blood glucose level occurring in a person with diabetes mellitus. On the contrary, Hyperglycemia is the technical term for high blood glucose because of too little insulin or when the body can't use insulin properly. The subsequent lack of insulin leads to increased blood and urine glucose. The classical symptoms are: polyuria (frequent urination), polydipsia (increased thirst), polyphagia (increased hunger), weight loss and tiredness including genetics and exposure to certain viruses. In this background, the present attempt was focused to evaluate and correlate the value of various biochemical markers in blood serum from acute renal failure patients. Among many biochemical parameters in blood, serum creatinine and urea are emerging as source of more sensitive markers for the detection of the acute renal failure.

1.1. Statement of the problem

Diabetes is a chronic health problem with devastating. A kidney renal failure is serious disease, which has major impact on life and can be accidentally fatal; several studies have demonstrated the high incidence of renal failure, which are of two types, it means acute and chronic renal failures. In this study, we discussed about acute renal failure among diabetic patients. Kidney disease is any important public health issue. It is common and the prevalence increases with age, which means that the disease burden will increase with our aging population. Yet, diabetes mellitus had preventable consequences. It is characterized by high blood glucose levels resulting from defects in insulin production, insulin action or both. Globally rate of type 2 diabetes were 15.1 million in 2000, the number of people with diabetes worldwide is projected to increase to 36.6 million by 2030. In 2007, 23.6 million people or 7.8% of the United States population had

type 2diabetes. Of these, 90-95% of these cases were adults with type 2 diabetes. Type 2 diabetes impact men and women proportionately; there are over 12 million men and 11.5 million women with diabetes. In 2008, diabetes affected 382 million adults worldwide and accounted 1.3 million deaths .In sub- Sahara Africa, diabetes is predicted to rise rapidly, increasing by 80% over 20 years and affecting 18.7 million by year 2025.Although Rwanda has a gross national income of US $ 630 per capita (2013) and 70% of the rural population was living in multidimensional poverty in 2010 ,diabetes remains a significant problem and national records indicates that diabetes was among the top five causes of morbidity in Rwanda.

1.2. Purpose of the study.

The incidence and prevalence of acute renal failure of the patients with diabetes have been continuous to increase over last 20 years. The purpose of this study is to assess the change creatinine, urea and proteinuria to the patients who are having diabetes, beyond the normal range. For checking renal function. If there are some changes on their functions.

1.3. Research questions

Following are the main research questions for this study:

1. What are the typical causes of acute(sudden) kidney failure?

2. If a patient is suffering from kidney disease, will he/she need dialysis?

3. Which condition the patient should start dialysis?

1.4.The aims of this study is

1. To determine the prevalence of acute renal failure among diabetic patients

2. To know what are the major causes of renal failure.

1.5. Objectives of the study:

1.5.1. General objective:

The general objective of this study is to determine the prevalence of acute renal failure and to discuss their causes and the tests of blood urea nitrogen, creatinine and proteinuria among diabetic patients attending kibogora hospital.

1.5.2. Specific objectives:

1. To determine the prevalence of acute renal failure among diabetes patients attending Kibogora Hospital

2. To determine factors associated to acute renal failure among diabetes patients attending Kibogora Hospital

3. To study the pattern and outcome of acute renal failure in diabetes mellitus.

1.6. The Significance of The Study

This study aims to determine the prevalence of acute renal failure among diabetic patients attending kibogora hospital in order to guide future intervention measures that will contribute towards elimination of acute renal failure among diabetic patients in kibogora hospital and generally in the whole Rwandan citizens. It is very important to know this relationship for proper management or prevention of acute renal failure caused by Diabetes. This study is also aims to help the medical practitioners to make critical decisions among diabetic patients about the care provided to prevent the risk of developing acute renal failure.

1.6.1. To the researcher

This research will provide us as the owner of this study to obtain a Bachelor's degree in the field of biomedical laboratory sciences in Kibogora polytechnic (KP). Furthermore; it will be taken as a resourceful document for other researchers to carry out their research in the same field of prevalence of acute renal failure among diabetic patients. Persons with acute renal failure require knowledge and skills in order to make life style adjustments and care for themselves. Effectively (Jaarsma et al,1999).

1.6.2. To the Government through the Ministry of health

In addition, this research will contribute to the Government of Rwanda through the Ministry of health, it is important those patients and their families receive education and support which will enhance their self-care abilities.Jaarsma et al. reported that acute renal failure education can positively influence lifestyle modification and recognition of worsening symptoms, as well as coping with chronic diabetes mellitus, for persons with acute renal failure. According to Bonsignore diabetes education is the cornerstone of diabetes management, because diabetes requires day-to-day knowledge of nutrition, physical exercise, glucose monitoring, and

medication, it makes you more aware of diabetes, what it takes to threat it, and gives you the power to control it.

1.7. Scope Of The Study.

The focuses of this study will be discussed into various scopes namely: content scope, geographical scope and time scope.

1.7.1. Content scope.

This study was limited to the prevalence of acute renal failure among diabetic patients attending Kibogora Hospital.

1.7.2. Geographical scope

The research was carried out in Kibogora Hospital. It is located in Western Province of Rwanda, Nyamasheke District, Kanjongo sector, Kibogora cell, KivugizaVillage, on the shores of beautiful lake Kivu. It is located 100 miles southwest of the capital city of Kigali, overlooking Lake Kivu and Democratic Republic of Congo (DRC) in western. It is bordered by Karongi District in North, Nyamagabe District in East, Rusizi district in south, and the shores of Lake Kivu.

1.7.3. Time scope

We provided getting more information from diabetic patients in 2016.

CHAPTER TWO: LITERATURE REVIEW

2.0. Introduction

This chapter consists of the overview of relevant literature on prevalence of acute renal failure among diabetes patients. Including, Theoretical Literature, Empirical Literature, critical review and research gap identification, Conceptual framework and Summary.

2.1. Theoretical literature

Acute kidney disease also known as acute kidney failure occurs when your kidneys suddenly become unable to filter waste products from your blood. When your kidneys lose their filtering ability, dangerous levels of wastes may accumulate, and your blood's chemical makeup may get out of balance (Pascual, 2014). Diabetes mellitus (DM) is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. Symptoms of high blood sugar include frequent urination, increased thirst, and increased hunger (Kgasi, 2017). Diabetes mellitus (DM) significantly increases the overall morbidity and mortality, particularly by elevating the cardiovascular risk. The kidneys are severely affected as well, partly as a result of intrarenal at hero- and arteriosclerosis but also due to no inflammatory glomerular damage (diabetic nephropathy). DM is the most frequent cause of end-stage renal disease in our society. Acute kidney injury (AKI) remains a clinical and prognostic problem of fundamental importance since incidences have been increased in recent years while mortality has not substantially been improved (Patschan and Müller, 2016).

2.2. Prevalence of acute renal failure

Renal failure (RF) is the common and severe complication of patients with diabetes mellitus. The prevalence is increasingly in this years and it is expected that by 2030 there will be 336 million diabetics worldwide, and the increase in life expectancy will influence the presentation of chronic complications and the prevalence will be 10 to 14% of the adult population (Vakrani, Ramakrishnan and Rangarajan, 2013).

Assessment and diagnosis of Acute Renal Failure in Diabetic person

Identifying patients with impaired renal function is crucial in the patient with plasma glucose level. Serum creatinine serves as the gold standard for assessing steady-state renal function, helping to define those with Acute and chronic kidney disease (Koyner, 2012) and Creatinine is normally used to evaluate kidney function among elderly patients in hospital practice. An the

study had shown that diabetic patient if they develop ARF the level of blood creatinine will increases (Bamanikar, Bamanikar and Arora, 2016) and that is why we used this test to evaluate Acute renal failure in diabetic patients.

As it is stated above, Acute Renal failure is one among the slowly progressive diseases of kidney function characterized generally by low glomerular filtration (GRF) and other various biochemical markers in blood serum from the pre and post dialysis renal failure patients. Among many biochemical parameters in blood, serum creatinine and urea are emerging as a source of more sensitive markers for the detection of the renal failure.(Nisha *et al.*, 2017). The study showed that the incidence of serum creatinine and serum urea was high in patients with Acute Renal failures (Nisha *et al.*, 2017). As Urea is a byproduct of protein breakdown. A test can be done to measure the amount of urea nitrogen in the blood. In kidney disease, these substances (as well as numerous others) are not excreted normally, and so they accumulate in the body thus causing an increase in blood levels of urea (Dabla, 2010) and this occur as result of diabetes in the body.

Abnormal protein excretion is often present in the setting of AKD caused by diabetes, with urine protein being measured semi quantitatively with a dipstick or quantitatively through urine protein to creatinine ratios (Koyner, 2012). The studies showed that proteinuria of increasing severity is associated with a faster rate of renal decline and by using this test it should be going together/ same line with types of tests(Turin *et al.*, 2013) and also study showed that diabetes cause acute renal failure which ends up by causing proteinuria (Muhammad and Nazar, 2014)

2.3. Factors associated to renal failure

There have been several studies in which factors affecting the development of diabetic nephropathy were examined in a relatively large number of patient with both type 1 and type 2 diabetes. In these studies hyperglycemia, cholesterol, Creatinine, blood urea nitrogen have been revealed to be significant risk factors for development of diabetic nephropathy (Muhammad and Nazar, 2014). Hypertension, cigarette, smoking, diabetes and obesity were listed among the well documented and modifiable risk factors for stroke. It has been well established that drug treatment of hypertension prevents stroke and other blood pressure-related target-organ damage. Stroke risk can be reduced in patients with diabetes, and there is a definite relationship between

smoking and both ischemic and hemorrhagic stroke, particularly at a young age.(Mataloun, Machado and Anestesiologia, 2010)

In this research project, the researcher will find out the better quantity of the overall risk factor among the population where it might be prevented, the major modifiable risk factors among diabetic patients attending Kibogora hospital as documented in other countries, and their association with the risk of stroke need to be better understood.

Empirical Literature

Global point

A study conducted by (TS Ferguson1 et al, 2015) in Jamaica with title of Prevalence of Kidney Disease among Patients Attending a Specialist Diabetes Clinic in Jamaica found that 50.8% were at high risk and 17.4% at very high risk of adverse outcomes. In his work (Mariscalco *et al.*, 2014) performed a retrospective analysis, based on the Society of Thoracic Surgeons National Database. All patients included between 2002 and 2004 were analyzed, with a total number of 449,524 individuals. The total prevalence of DM was 33%.

Regional point

In a study conducted in Uganda with a title Prevalence and correlates of proteinuria in Kampala, Uganda: a cross-sectional pilot study by (Lunyera *et al.*, 2016) they found that Proteinuria was most prevalent among young (18–39 years) adults (n = 14; 16 %) and among those who reported a history of alcohol intake (n = 10; 32 %). A study conducted by (Korsah, 2010) in Ghana with title called prevalence of renal impairment in diabetics with hypertension in Ghana found that there is a very high prevalence rate of microalbuminuria, and macroalbuminuria. This makes us to conduct also this research in Rwanda especially in Kibogora hospital to see the prevalence of ARF among diabetic patient attending this hospital.

Local point

To the best of our knowledge there is no study has been conducted in Rwanda to identify the prevalence of Acute Renal failures among diabetic patients especially attending Kibogorahospital, this study will provide information necessary for future intervention to the diabetic patients to prevent renal failure among them.

CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

3.0. TARGET POPULATION

According to Burns Grove (1993:779), a population is defined as all elements (individuals, objects and events) that meet the sample criteria for inclusion in the study. The study population was consisted of all young and adult diabetic patients and their living-in family members in Nyamasheke District all attending Kibogora hospital. We selected 15678 patients of all patients attended Kibogora Hospital in year 2016 in order to know how people from the specified area suffer from diabetes mellitus, kidney failure due to creatinine caused by waste product of creatine, and how can be prevented by taking in account patients attending Kibogora hospital in account.

3.1. SAMPLING PROCEDURES

A stratified random sampling was used for implementing research methodology we have used. This technique was used to ensure a representation of the variable of the study. The stratification was based on the diabetic patients attendedKibogora Hospital in 2016. Concerning sampling technique, Alain BOUCHARD formula was used; as a practical matter, we are seldom in a position to guarantee that every element meeting the theoretical definitions laid down actually has a chance of being selected in the sample.

$$n_c = \frac{n}{1 + \frac{n}{N}}$$

$$n_c = \frac{n * N}{n + N}$$

3.2. SAMPLE SIZE

A convenient sample of 81 patients was selected from the institution. A convenient sample consists of subjects that will be included in the study because they will be happening to be in the right place at the right time (Polit&Hungler 1993:176). Available subjects entered into the study until a sample size of 81was reached. The subjects who met the sample criteria identified by the researchers at Kibogora Hospital in the wards and out patient's department of Kibogora Hospital. As this study was interested on Prevalence of acute renal failure among diabetic patients attending Kibogora Hospital, for COATHN(1989:34) and repeated by BOUCHARD (1992:9), when the population is below 1,000,000 people at 5% of level of significant, the precision is 81.

With the size of considered total population of 15678, the considered sample size was:

$$n_c = \frac{81}{1 + \frac{81}{15678}}$$

$$n_c = \frac{81}{\frac{15678+81}{15678}}$$

$$n_c = \frac{81 * 15678}{15678 + 81} = 80.58 \cong 81$$

Hence, 81 people were considered as a sample size in study area of Kibogora hospital putting into account on diabetic patients' tests and their corresponding results.

3.3. RESEARCH INSTRUMENT FOR DATA COLLECTION

In this research we have used interview guide nurses and Doctors, observation guide, checklist guiding by using data stored in Kibogora Hospital for patients attended that organization in 2016, Laptop to store, analyze and display the information, and papers to collect data.

3.4. DATA COLLECTION

3.4.1. Data collection instrument.

An observation guide, checklist guiding by using data stored in Kibogora Hospital for patients attended that organization in 2016. Data was collected from the patients' and their family members' knowledge and views on diabetes mellitus and acute renal failure.

3.4.2. Data collection procedure

Checklist guiding by using data stored in Kibogora Hospital for patients attended that organization in 2016, was the main method for gathering data. The data was collected over a period of about August 2018.

3.5. ETHICAL ISSUES

The conducting of research required not only expertise and diligence, but also honesty and integrity. This is done to recognize and protect the rights of human subjects. To render the study

ethical, the rights to self-determination, anonymity, confidentiality and informed consent have been observed.

3.6. DATA ANALYSIS

After collecting the data, they was organized and analyzed by us. Thereafter, Data was stored in a Laptop to be interpreted and printed on papers.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS INTERPRETATION AND SUMMARY.

4.0. INTRODUCTION

After gathering data from different diseases, they were visited for a thorough interpretation, analysis, presentation, and discussion. Information collected was tabulated in their law form. Data were analyzed basing on objective of the study. The data collected served as a tool to measure the results obtained from the field. These data are tabulated and presented under various headings which constitute different areas of the researcher. The data were taken in a sample of 81 results from a total population of 15678, basing on the tests on patients attending Kibogora Hospital. This chapter consists of these findings and the summary of the researcher's findings.

4.1. PRESENTATION OF FINDINGS AND INTERPRETATION.

This part attempts to analysis the data collect, interprets findings from the research filled in order to relate it with study objectives.

The primary data were presented in form of statistical tables and the findings based on the data collected from 81tests by using. Observation guide, checklist guiding by using data stored in Kibogora Hospital for patients attended that organization in 2016

After collection of data, Word and excel programs have been used in order to prepare the tables.

4.1.1. In regard to the gender of patients
Table 1:Number of respondents according to their gender

Sex	Number	Percentage
Male	25	31%

Sex	Number	Percentage
Female	56	69%

The table above presents 31% of male and 69% of female for results from tests that have taken from Diabetic patients attended Kibogora Hospital in 2016

4.1.2. Concerning age group of respondents

Table 2:Age of respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	**Equal and under 20 years**	3	3.7	3.7	3.7
	From 21 to 30 years	3	3.7	3.7	7.4
	From 31 to 40 years	8	9.9	9.9	17.3
	From 41 to 50 years	12	14.8	14.8	32.1
	Trom51and above	55	67.9	67.9	100
	Total	81	100.0	100	

On this table above, 3 out 81results for the tests of respondents equal to 3.7% and they are under 20 years of age, 3 out of 81 respondents equal to 3.7% are between 21 to 30 years of age, 8 out of 81 of the respondents equal to 9.9% are between 31 to 40 years of age,12 out 81 of respondents equal to 14.8% are between 41 to 50 years of age, and 55 of the respondents equal to 67.9% have age of 51 and above.

4.1.3.. Immense power of creatine in tested sample at Kibogora Hospital.

Creatine is one of the world's most effective sports supplements. It has been tested in hundreds of human studies, and is one of the most researched supplements in history. It is well known for its uses in sports and body building. It can increase muscle mass, strength and high-intensity exercise performance, for a normal person.

Table 3:The average quantity of secretion of creatinine and its impact on diabetic patients.

Serum creatinine(mg/dl)	Number of samples	Percentage (%)
From 0 to 0.4	5	6.2
From 0.4 to 0.9	40	49.3
From o.9 to 1.4	19	23.5
Above 1.4	17	21

Generally, however, a normal creatinine levels range from 0.9 to 1.3mg/dl for men and 0.6 to 1.1mg/dl for women. Particularly the normal range is 0.4 to 1.4mg/dl.

4.1.4.Attitude and knowledge of people about diabetes mellitus

Knowledge plays a vital role in any future disease development and its early prevention and detection. Positive knowledge, attitude and practice (KAP) are important for DM patients

4.1.5. Knowledge, attitude and practice related to diabetes mellitus among patients attending Kibogora Hospital

Observations we have conducted shown us that Diabetes mellitus has become a global epidemic with significant disability and premature death among patients attending Kibogora Hospital in 2016. Identification of the level of knowledge, attitude and practice (KAP) related to diabetes among the general public is important in strategies for prevention of diabetes mellitus.

4.2.DISCUSSIONS OF FINDINGS

Diabetes mellitus is a chronic condition but people with diabetes can lead a normal life provided they keep their diabetes under control. Improve blood glucose control can slow the progression of long term complication, small change can lead to improvements in diabetic patients attending Kibogora Hospital.

Gender: Majority of the subjects from a sample of 81 patients from patients admitted at KH in 2016, 69%were female compared to male (31%). The findings related to age, marital status, educational level, religion, type of family, residence family income, food habits, fasting for religious purpose, smoking habits, duration of diabetes, type of medication prescribed ,undergone eye test after diagnosis of diabetes, et cetera, were not considered.

Findings related to diabetes exercise.

Exercise is beneficial for all individuals with or without diabetes even person with long standing diabetes or diabetes complications can benefit from exercise. For diabetic exercise promotes cardiovascular fitness and weight loss, lower the high blood pressure, lipid and blood glucose level, and leads to an overall sense of wellbeing.

In this study, the majority of the patients were with a better understanding on diabetes exercises.

Findings related to renal failure

The guideline for renal failure management recommend specific diet recommendations, e.g.low-sodiun diet, fluid restruction, and the importance of daily weight.the serum creatinine level at the level greater than1.4mg/dl was found in 17 samples of the respondents among 81 which is 21% and we have found that is elevated or than normal due to a brocken urinary tract, a high- protein diet, dehydration, kidney problems, such as kidney damage or infection, reduced blood flow to the kidneys due to shock, congestive heart failure, or complications of diabetes

4.3. SUMMARY OF FINDINGS

Diabetes is a silent killer. Silently, its complications are developed due to continue elevation of blood glucose with damages the blood vessels that kidney, nervous system and even the eyes. The associated classical symptoms are frequent urination, excess hunger, weight loss, thirst, fatigue, weakness, et cetera.

Moreover, the insulin dependent diabetes mellitus (IDDM) Patients are prone to ketoacidosis whereas non-insulin dependent diabetes mellitus (NIDDM) is associated with infection or stress ketosis.

CHAPTER FIVE: GENERAL CONCLUSION AND RECOMMENDATIONS.

5.0. INTRODUCTION

This chapter represents the summary of the major findings, conclusion and recommendations that have arisen from the study. The findings are in line with research objectives and research questions. The conclusions are related to the findings and recommendations are in relation with conclusion, and it presents the researchers' suggestions for further study.

5.1. CONCLUSION

The research on thePrevalence of acute renal failure among diabetic patients attending Kibogora Hospital.

With limitations, this study concludes that,

- ✓ Most common causes of renal failure in our study were found to be sepsis and urinary tract obstruction.
- ✓ Among drug induced renal failure, NSAIDs (Nonsteroidal anti-inflammatory drugs), were noted to be most common cause.

Physiologically, exercises help to spend more energy in burning glucose and improve the functioning ability of circulatory system so that every cell receives nutrition and sends out accumulated waste product.Burning glucose also improve insulin sensitivity, therefore, functional ability of all organs might have regained and associated problems on lipid profile include uric acid content in serum is controlled and finally, this can prevent or reduce the renal failure among diabetic patients attending Kibogora Hospital.

5.2. RECOMMENDATIONS

According to the findings we have gotten in this study entitled the Prevalence of acute renal failure among diabetic patients attending Kibogora Hospital, this study recommends the following:

1) Causes of acute renal failure in patients with diabetes mellitus like urinary tract obstruction, sepsis have favorable outcome if treated appropriately

2) Early detection, diagnosis and aggressive management of acute renal failure in diabetes mellitus should be carried out to attain renal failure recovery.

3) Renal biopsy in patients with diabetes mellitus with in complete recovery of acute renal failure of features a typical of diabetes nephropathy will yield the underlying a causative factor and upon appropriate treatment would lead renal failure recovery.

5.3. SUGGESTIONS FOR FURTHER STUDY.

We recommended other researchers for the following topics:

Further research into better therapies is still required

Technologies for prevention and treatment of hypoglycemia unawareness should be improved.

The demands of following a complex diabetes selfcare regimen may be high, as for further researchers to discuss about how it can be reduced.

In general, the intent of this program is to further expand the field of diabetes research by providing a complementary, rather than redundant, source of finding of new ideas and multidisciplinary approaches to diabetes research.

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APPENDICES

APPENDICE I. FORMS TO BE FILLED BY RESEARCHERS

I.   Patient's identification

1. Gender: -Male…………………

           -Female………………

2. Age

Under 20 years old………………………

From 21 to 30 years old…………………

From 31 to 40 years old…………………

From 41 to 50 years old…………………

Above 50 years old……………………..