KIBOGORA POLYTECHNIC

FACULTY OF HEALTH SCIENCES

DEPARTMENT OF BIOMEDICAL LABORATORY SCIENCES

TOPIC: PREVALENCE OF ALBUMINURIA AMONG PREGNANT WOMEN ATTENDING NYABITIMBO HEALTH CENTER.

Case study: NYABITIMBO Health Center

Period: April to May 2019

A Research paper submitted in partial fulfillment of the requirements for the Bachelor's degree with honor in biomedical laboratory sciences.

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Kibogora, August 2019

DECLARATION

Declaration by the candidates

We are NAHIMANA Janvière, and MUKAGATARE Bernadette at this moment declares that this is our original work and not a duplication of any similar academic work. It has, therefore not submitted to any other institution of higher learning. All materials cited in this paper which are not our own have duly acknowledged.

NAHIMANA Janvière MUKAGATARE Bernadette

SIGNED..... SIGNED.....

DATE

Declaration by the supervisor

We declare this work has been submitted for examination with our approval as KP supervisor.

Supervisor names: Mr. HITAYEZU Elysee

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ABSTRACT

The researches entitle Prevalence of albuminuria among the pregnant women attending NYABITIMBO health center. Albuminuria is the major public health concern at NYABITIMBO health center. Pre-eclampsia is a global problem that affects 2-8% of pregnancies, and an estimated 8.3 million women develop the disease each year. For developing countries, the priority is preventing maternal deaths from multi-organ complications of the disease. The difference in case fatality rates from eclampsia between developing countries and non-developed countries 0.72% v 5.2%. Suggests that mortality is easily avoidable. In developed countries where death is rarer, research is directed towards improving the prediction and prevention of pre-eclampsia and minimizing morbidity (Cai, Wang, Li, Cheng, & Zhang, 2017).

The main objective of this study is to determine the prevalence of albuminuria among the pregnancy women attending NYABITIMBO health Center. We take consent files containing results of Albuminuria of those pregnant women.

The methodology of our study is retrospective in all ages of pregnant women. The total number of pregnant women requested albuminuria test was 138, pregnant women with Albuminuria were 20 (14.5%) with the prevalence, and the total numbers of pregnant women without Albuminuria were 118 (85.5%) with the prevalence.

We recommend that a study through the literature review, retrospective review, or other approached be conducted to assess knowledge about Albuminuria among pregnant women. We recommend to Rwanda Ministry of health: We suggest doctors and nurse to continue screening all pregnant women for albuminuria whole the entire period of pregnancy because albuminuria may develop to any stage of pregnancy, particularly in second and third trimester and to NYABITIMBO Health Center Evaluation and advice for those pregnant women between 29 to 34 years, and between 34 to 39 years, train health practitioners about guidelines.

DEDICATION

We would like to dedicate this work to the Almighty God for the knowledge we have acquired through his strength He gives us in our studies.

We also dedicate to our beloved Fathers and our Mothers for their parental love and support; supervisor from Kibogora polytechnic and our loved relatives, friends, who influenced us to the completion of our study.

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LIST OF ABBREVIATION

EGFR: Estimated Glomerular Filtration Rate

NHC: Nyabitimbo Health Center

K.P: Kibogora Polytechnic

KPU: Kibogora Polytechnic University

CV: Cardiovascular

MA: Macro Albuminuria

HD: hemodialysis

CKD: Chronic Kidney Disease

PE: preeclampsia

NICE: National Institute for Clinical Excellence

WHO: World Health Organization

HELLP: Hemolysis, Elevated Liver Enzyme, and Low Platelets

SPSS: Statistical Package for Social Sciences

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CHAPTER ONE: INTRODUCTION

1.1. INTRODUCTION

This chapter involves the background of the study, the Problem statement; the purpose of the study, the objectives of the study, research questions, significance of the study and scope of the study.

1.2. BACKGROUND OF THE STUDY

Albuminuria in World Health Organizations a condition of having too much protein in the urine, which results from damage within the kidneys. Albuminuria in diabetes will usually be the result of either long term hyperglycemia (high blood sugar levels) or hypertension (high blood pressure)(Anthony Kodzo, 2012).

Albuminuria is associated with cardiovascular disease, and the relationship between albuminuria and hypertension is well established in many studies. So the control of hypertension is critical for decreasing cardiovascular events and Albuminuria(Paul et al., 2017).

When the kidneys are working correctly, they filter waste products out of the blood but keep in important elements including, albumin. Albumin is a protein which helps to prevent water from leaking out of the blood into other tissues. If high blood sugar levels several years damage the kidneys, they may allow too much albumin to be lost from the blood pressure proteinuria is a sign therefore that the kidneys have become damaged(Suarez, Kattah, Grande, & Garovic, 2019).

Pre-eclampsia: Gestational hypertension with significant proteinuria (>= 0.3g/l) after 20 weeks of gestation or during labor and within 48 hours of delivery Eclampsia: convulsions occurring ante-, intra- or postpartum, associated with high blood pressure and proteinuria Statistics from network database(Cassia et al., 2018).

Some pregnancies end tragically with maternal and fetal/child death or cause severe maternal and child impairment. In 2013, about 300000 maternal deaths occurred worldwide, and every year, more than one and half million women suffer from pregnancy-related complications during pregnancy and delivery(Paul et al., 2017).

The most common pregnancy-related complications are hypertensive disorders (pre-eclampsia, eclampsia, and pregnancy-induced hypertension. According to the WHO, hypertensive disorders during pregnancy account for 9% of maternal mortality in Africa and Asia 5.8 %. Pre-eclampsia, characterized by hypertension and proteinuria, complicates 3%–5% of pregnancies worldwide(DORTE M. JENSEN, PETER DAMM, 2010).

Pre-eclampsia can develop into eclampsia, characterized by the seizures that may be fatal for both mother and fetus. In 2013, the prevalence of pre-eclampsia/eclampsia in the East African region (i.e., Democratic Republic of Congo, Kenya, and Uganda) was 1.02%, 2.27% and 1.15%, respectively(Cassia et al., 2018) .

Prolonged labor or obstructed labor occurs when the fetus does not progress into the birth canal despite strong uterine contractions. Eleven obstructed labor represents8% of maternal deaths globally. In 2010, the incidence of obstructed labor was around 12.2% in Ethiopia and 3.7% in Rwanda in 2011.Rwanda's national guidelines on the management of some obstetric and gynecological common cases are very similar to those of the WHO and thus also similar to those used in many other countries(Ministry of health, 2015).

In these guidelines, pre-eclampsia is defined as blood pressure of ≥140/90/90mm Hg after 20 weeks of gestation plus proteinuria of 300mg per 24hours or >2+ on a urine dipstick(Dolea& Abouzahr, 2003). Furthermore, eclampsia is defined as the onset of convulsion/generalized seizures in a woman with pre-eclampsia that cannot be attributed to other causes(Ministry of health, 2015).

1.3. PROBLEM STATEMENT

In pregnant women, the purpose of follow up of pregnant women aims to have a normal delivery, but patients with albuminuria quite often develop progressive complication which ends up in need of iatrogenic delivery. In a normal pregnancy, there is an increase in total urinary protein and albumin excretion, especially notable after 20 weeks (Lulzime&Mirela, 2015). The high incidences of albuminuria in pregnant women have consequences on the mother and the fetus. Albuminuria may suggest kidney damage, and may eventually lead to its failure.

Amyloidosis, a complication which can result from proteinuria may eventually lead to weight loss, anemia, and immune system disorders to the mother and the child as well (WHO, 2008).

Damage to the kidney may lead to soft bone formation in the fetus due to decrease production of vitamin D in the mother. Some of the risk factors include drug use, strenuous exercise, kidney disease, high blood pressure ,and diabetes(DORTE M. JENSEN, PETER DAMM, 2010).
The government of Rwanda found that the, pregnant women have a kidney which is not performing well indicated by albuminuria(Ministry of health, 2015). Government of Rwanda due To those serious problem affect pregnant women establishes measures of following up pregnant Women in all health- related center and hospitals, but we are still having a case of Albuminuria in Rwanda especially for pregnant women. Therefore the objective of study is to evaluate the prevalence of albuminuria among pregnant women attending NYABITIMBO health center.

1.4. PURPOSE OF THE STUDY

In Rwanda, still there is a gap in knowledge of the prevalence of albuminuria among pregnant women, hence the need for this study. The results of this study will provide information of prevalence of albuminuria among pregnant women in Rwanda which can be used to minimize the incidence of albuminuria among pregnant women, and this will help to set new policies on how to take care, reduce and prevent that complication of albuminuria to pregnant women.

1.5. OBJECTIVES OF THE STUDY

1.5.1 MAIN OBJECTIVE

To determine the prevalence of albuminuria among pregnant women attending NYABITIMBO Health Center.

1.5.2 SPECIFIC OBJECTIVES

I. To determine the prevalence of albuminuria among pregnant women attending NYABITIMBO Health center.
II. To determine factors associated with albuminuria among pregnant women attending NYABITIMBO Health Center.
III. To determine complications of albuminuria among pregnant women attending NYABITIMBO Health Center.

1.6. RESEARCH QUESTIONS

1) What is the prevalence of albuminuria among pregnant women attending NYABITIMBO Health Center?
2) What are the complications of albuminuria among pregnant women attending NYABITIMBO Health Center?
3) What are the factors associated with albuminuria among pregnant women admitted NYABITIMBO Health Center?

1.7. SIGNIFICANCE OF THE STUDY

The significance of our study helps to know Measurements which should be taken to avoid those problems caused by Albuminuria, for encourage the pregnant women to take nutritional supplementation, antenatal care, life style, and anticonvulsant drug (magnesium sulfate). Diuretics are the drug that stimulates water and sodium excretion, so that urine volume increased. The commonly used diuretic is bendrofluozide, fruazide, frusemide, spironolactone, and mannitol. Diuretics are important in the treatment of edema, heart failure, and hypertension. When the measurements are followed will help us to serve health of pregnant women and fetus in Rwanda.

1.8. SCOPE OF THE STUDY

The study was conducted in NYABITIMBO HEALTH CENTER located in Rwanda, Western Province, Rusizi District; Butare Sector, Gatereri cell, by analysis Albuminuria result recoded which contain social-demographic characteristic including: lab codes, age, sex, clinical information of pregnant women requested Albuminuria test. This research was taking a period of four months. This study was conducted from April to May 2019.

CHAPTER TWO: LITERATURE REVIEW

2.0. INTRODUCTION

This chapter contains definition of key terms, pathophysiology of albuminuria, and diagnosis of albuminuria.

2.1. DEFINITION OF KEY TERMS

Albuminuria is the presence of protein in the urine. Albuminuria assessment is a key test in pregnancy to evaluate renal and systemic well-being(Cassia et al., 2018).

Pregnant, also known as gestation, is the time during which one or more offspring develops inside a woman(Cassia et al., 2018).

Prevalence refers to a sum of instances of a particular disease within the given population at a certain point in time.(Noordzij, Dekker, Zoccali, & Jager, 2010).

Pre eclampsia define as Protein leaking into the urine combined with high blood pressure (Co-operative & Oxford, 2014).

Albuminuria is defined as the presence of urinary albumin in amounts exceeding 0.3 g in a 24 - hour urine collection or concentrations more than 1g per liter (1+ on urine dipstick)(Strasinger, Susan King, 2008). When protein excretion exceeds these levels in a pregnant woman, it is considered abnormal and a sign of preeclampsia after 20 weeks' gestation. (Paul et al., 2017)

However, before pregnancy or before 20 weeks gestation, albuminuria is considered a sign of existing underlying renal disease(Wendy Arneson, 2007). Proteinuria in pregnancy is a clinical entity which is of interest to the obstetrician, nephrologists, urologist, general physician as well as the patient's general practitioner(Cassia et al., 2018).

There are many reports of the harmful effects of Albuminuria in pregnancy about hypertension and preeclampsia. The dipstick test, which can be used for semi-quantitative determination of protein concentration in spot urine, is used as a screening test to detect significant proteinuria. (Bae, Kim, Choi, Ma, & Kim, 2017)

Studies imply that the correlation between dipstick urinalysis and 24 hour protein estimation is weak and NICE recommend that with significant proteinuria, automated dipstick readers be used to improving the rate of false- positive and false negatives and a dipstick finding of proteinuria should be confirmed by 24- hour urine collection/protein creatinine ratio(Strasinger, Susan King, 2008).

Protein leaking into the urine combined with high blood pressure defines pre-eclampsia, a condition affecting 2-8% of pregnancies in the UK. Pre-eclampsia can lead to eclampsia; a serious condition with seizures and a high mortality rate 0.83%. There are around 300-400 confirmed cases of pre-eclampsia in the UK every year. A recent audit of maternal deaths in the UK reported 19 deaths from pre-eclampsia and eclampsia during 2006-2008 indicating that the number of deaths from pre-eclampsia has not fallen since the 1991-1993 report. Diagnosing pre-eclampsia requires monitoring of blood pressure and proteinuria, typically by midwives at intermittent times during pregnancy(Co-operative & Oxford, 2014).

In pregnant ladies with the renal disease, the main aim is to have a delivery at term, but patients with preeclampsia quite often develop progressive disease, which ends up in need of iatrogenic delivery. In situations when it is difficult to distinguish preeclampsia from pre-existing renal disease, it is pertinent to assume a working diagnosis of preeclampsia because of its potential for rapid development of serious maternal and fetal complications(Paul et al., 2017).

Proteinuria (or hypertension) which persists longer than three months post-delivery should be followed up closely. Preeclampsia is a multi-system disease that manifests as hypertension and proteinuria in pregnancy. It is peculiar to pregnancy, of placental origin and is only cured by delivery. Preeclampsia affects nulliparous women and is less common in multiparous women unless additional risk factors are present(Suarez et al., 2019).

Pre-Eclampsia (PE) is one of the most common causes of complications in pregnant women leading to maternal morbidity and the mortality, and it is the second most common cause of abnormal pregnancy outcome. Pre eclampsia is commonly observed during the second trimester of pregnancy, with blood pressure greater than 140/90 mmHg and presence of albumin in the urine (usually more than 300 mg in 24 h). The prevalence of pre eclampsia ranges from 4% to 7% among pregnant women. In women with mild to moderate PE, generally, no symptoms

reported. Pregnant women with severe PE often experienced increased blood pressure, headache, and proteinuria(Cai, Wang, Li, Cheng, & Zhang, 2017)

2.2. Pathophysiology of Albuminuria

Blood vessel endothelial cell damage plus an exaggerated maternal inflammatory response leads to Increase vascular permeability causing edema and albuminuria, Vasoconstriction causing hypertension, eclampsia (reduced cerebral perfusion) and liver damage, Reduced placental blood flow causing intrauterine growth restriction, Clotting abnormality.

It has been suggested that proteinuria is a consequence of two mechanisms. It can be due to the abnormal trans-glomerular passage of proteins due to increased permeability of the glomerular capillary wall and the impaired reabsorption by the epithelial cells of the proximal tubules (Anthony, 2012).

The events resulting in pre-eclampsia begin early in gestation, and precede the onset of the clinical features. One of the early pathophysiological hallmarks is endothelial cell damage. Microalbuminuria is a marker of endothelial dysfunction and, in the general population, is associated with hypertension, obesity, diabetes, and overt renal disease, and also with an increased risk for myocardial infarction, stroke, and premature death. The risk rises with the urinary albumin concentration, even within the so-called normal range. Microalbuminuria might be used as an early marker of endothelial dysfunction in pre-eclampsia, before the onset of the overt syndrome, as it is likely that overt proteinuria is preceded by a microalbuminuria phase.(Hfa & Aea, 2017)

In glomerular diseases, more damage to the glomerular capillary wall means the glomerular barriers are more likely to be permeated by high molecular weight proteins, to which the barriers are normally impermeable. The increases the concentration of those proteins in the tubular lumen lead to the saturation of reabsorptive mechanism by the tubular cells and damage them. This, in turn, promote the urinary excretion of all proteins, including low molecular weight protein which is reabsorbed in normal physiologic condition.(Anthony Kodzo, 2012)

Gestational albuminuria is a clinically common pregnant complication in the obstetric department, the causes of it include eclampsia, HELLP syndrome, chronic kidney disease (CKD), renal dysfunction, and so on. Gestational albuminuria is closely related to adverse pregnancy comes, and the persisting proteinuria is one of the critical factors that were lead to

kidney injury. Urine protein may induce renal tubular epithelial cell apoptosis by way of direct toxic effects and lead to kidney injury by immune-mediated mechanism or promote the produce of reactive oxygen species. All the pathogenesis above may worse the existed renal lesions before pregnancy and result in end-stage renal disease. (Xie et al., 2017).

Even if slightly increased during pregnancy, urine protein excretion seldom reaches levels that are detected by usual screening method, such as on urinary dipstick (i.e...30mg/dl, which is roughly equivalent to 300mg in 24hrs). Although the mechanism for this possible increase has not been established, it seems likely that absorption of filtered protein in the proximal tubule is reduced, high by showed that in normal pregnant women without preeclampsia, underling renal disease, or urinary tract infections, the mean 24hrs urine proteins did not increase significantly by trimester 14.(Airoldi & Weinstein, 2007)

Gestational hypertension: two or more readings of a diastolic blood pressure of 90 mm Hg or more taken at least 4 h and up to 168 h apart and occurring after 20 weeks of pregnancy, excluding labor; chronic hypertension: on antihypertensive treatment pre-pregnancy or as defined above, but occurring before 20 weeks' gestation; severe hypertension: diastolic blood pressure >110mmHg; pre-eclampsia: gestational hypertension with proteinuria; proteinuria: excretion of 300 mg protein or more over 24 h; chronic hypertension with superimposed pre-eclampsia: chronic hypertension with new development of proteinuria; severe pre-eclampsia: severe gestational hypertension with proteinuria; HELLP: hemolysis, elevated liver enzymes and low platelets syndrome and eclampsia (seizures) also meeting pre-eclampsia criteria. Proteinuria was quantified when 1+ or more was detected on routine dipstick urinalysis(Bramham et al., 2013).

Protein excretion is considered abnormal in pregnancy women when it exceeds 300mg/24hrs at any time during gestation ata level, which dipstick became positive at the level (with ideal correlation 14). The gestational age at which proteinuria is first documented is important in assessing the etiology of proteinuria. Documented before pregnant or before 20 weeks of gestation suggest preexisting renal diseases. In women with pre-existing proteinuria, in the absence of preeclampsia, pregnancy cause increase in the amount of proteinuria in both second and third trimesters and even potentially in the first trimester(Paul et al., 2017).

Patient with diabetes or hypertension with microalbuminuria (MA)/proteinuria is prone to CV risk and progressive renal damage. This risk increases progressively with increasing level of proteinuria. 1-3 MA generally increases the relative risk of CV mortality by 1.3, and macro proteinuria by 2.4, 10-20% of hypertensive, 30-40% of diabetic and 5-7% of health population has MA.The CV risks exist even in seemingly health population with MA (without diabetes or hypertension). A population- based British study on ischemic stroke reported a hazard ratio of 1.48 patient with MA and 2.46 for macroproteinuric patients. Central obesity is an early and independent risk factor for increased Albuminuria in norm glycemic south Asian subject. This could explain the high incidence of diabetic renal disease in south Asian, probably by the mechanism of insulin resistance and endothelial dysfunction in a prediabetes state(Suarez et al., 2019).

Preeclampsia (PE) affects around 25% of pregnant women. It is a measure cause of maternal and prenatal morbidity and mortality in any attempt to prevent preeclampsia, many strategies based on antenatal care, change life style, nutritional supplementation, and drugs have been studied (Bezerra, Moura, & Lopes, 2012).

Preeclampsia is defined as BP $\geq$ 140/90 mm Hg in a previously normotensive woman, measured on two different occasions at least four hours apart, after 20 weeks of gestation, in the presence of proteinuria with protein excretion $\geq$ 300 mg/d or UPCR $\geq$ 0.3 g/g. A diagnosis of preeclampsia also can be made in the absence of proteinuria in the presence of clinical features of severity. During the last two decades, the heterogeneity of preeclampsia concerning underlying mechanisms, and resultant clinical phenotypes has been increasingly recognized. Major breakthrough in the pathophysiology of preeclampsia have occurred that attributed impaired angiogenesis in preeclampsia to an imbalance between proangiogenic (serum vascular endothelial growth factor and placental growth factor [P1GF]) and antiangiogenic (soluble FMS-like tyrosine kinase 1 and soluble endoglin) factors, favoring the latter. However, angiogenic abnormalities seem to be informative for severe and early (<34 weeks of gestation) forms of preeclampsia, but not for late disease ($\geq$34 weeks of gestation).(Suarez et al., 2019)

Many factors complicate the prevention of preeclampsia cases. Most are attributed to unknown etiology, the low predictive value of current screening test, and several presentations of the disease. Intervention that determines a small reduction in risk means that a large number of women need to be treated to prevent a single case. For now, definitive treatments remain delivery and removal the placenta, no effective prophylaxis for PE is formerly advised currently. However, given PE is considered such a global health problem with a relatively high rate of maternal and neonatal morbidity and mortality in many countries, prophylactic interventions with small or moderate benefit may be worthwhile.(Bezerra et al., 2012)

Hypertension in pregnancy (HIP) is defined as a systolic blood pressure ≥140 or diastolic blood pressure ≥ 90 mmHg or both. It could be described as chronic, gestational, preeclampsia, or eclampsia depending on the gestational period, the tendency for postpartum resolution, presence of proteinuria or convulsion. Hypertension in pregnancy affects about 5-22% of pregnancies especially in developing countries. It is the most common medical problem of unknown etiology during pregnancy and associated with adverse risk across the globe especially in developing countries. Though preeclampsia and eclampsia seem to create more concern than others, evidence abounds that any form of hypertension in pregnancy places women at increased risk of adverse outcomes(Azubuike & Danjuma, 2017).

There is Severe preeclampsia was usually defined as preeclampsia associated with any of the condition follows: severe hypertension (i.e. SBP ≥ 160 mmHg and/ or DBP ≥ 110 mmHg), thrombocytopenia < 100.000/μL, and impaired liver function with liver transaminases higher than twice the normal values(L, B, H, & B, 2014).

2.3. Diagnosis of Albuminuria

Albuminuria

Albumin is a type of protein that is normally found in the blood. Albuminuria is a pathological condition where the protein albumin is abnormally present in the urine. It is a type of proteinuria. Albumin is a major plasma protein; in healthy people, only trace amounts of it are present in urine, whereas larger amounts occur in the urine of patients with kidney disease(Carl a.burtis, 2008). A normal amount of albumin in your urine is less than 30 mg/g. Anything above 30 mg/g may mean you have kidney disease, even if your glomerular filtration rate number is above 60(Arneson, 2007).

To confirm the diagnosis of preeclampsia, if urinalysis is positive for proteinuria, infection is excluded by urine cultures and the protein is quantified by either 24- hour urine collection or protein creatinine ratio on a single sample. More than 30mg/nmol on protein creatinine ratio or > 0.3g/24 hour on urine collection represents significant proteinuria. Blood pressure and urine are checked at every antenatal appointment. Investigations in preeclampsia also include monitoring blood tests, ultrasounds, umbilical artery Doppler scans ,and cardiotocography.(Anthony Kodzo, 2012)There are other measurements used for urinary albumin, an immunochemical method such as enzyme-linked immunosorbent assays (ELISA) ,and high-performance liquid chromatography (HPLC) (Hfa & Aea, 2017)

CHAPTER THREE: METHODOLOGY

3.1. INTRODUCTION

This chapter describes the methodology we used for the study including; Study area, study design, tools used in the study, study population, sample size, data collection methods, principle of albuminuria, data analysis, reliability and validity, and ethical consideration.

3.2. STUDY AREA

The study was conducted in NYABITIMBO HEALTH CENTER located in Rwanda, Western Province, Rusizi District; Butare Sector, Gatereri cell, and it serves health center that provides quality services for the clients. NYABITIMBO HEALTH CENTER delivers healthcare service to the general Population that comes from almost in BUTARE Sector and others. This area was chosen because it is near, easy to get data of Albuminuria among pregnant women.

3.3. STUDY DESIGN

A retrospective design was used in this study to describe the prevalence of albuminuria among pregnant women attending at NYABITIMBO Health Center

3.4 RESEARCH INSTRUMENTS FOR DATA COLLECTION

Research instruments for data collection used in our study include pens, papers, book of health center contain result of the client, and laptop machine.

3.5. STUDY POPULATION

The study was conducted in pregnant women attending NYABITIMBO Health Center. During the study, the population of interested was pregnant women requested Albuminuria test at NYABITIMBO health center from April to May 2019.

Inclusion Criteria: all pregnant women attended NYABITIMBO Health Center, requested albuminuria test during the data collection period between April and May 2019.

Exclusion Criteria: pregnant whom Albuminuria is not requested attending NYABITIMBO Health Center.

3.6. SAMPLE SIZE

The study was all pregnant women attended NYABITIMBO health center from April to May 2019 who were meet the design criteria within the given data collection period were 138 pregnant women requested albuminuria test. The calculation of 138 pregnant women requested albuminuria test as the sample size was determined using formula(Rosner, 2010).

$$n = \frac{z^2 p(1-p)}{e^2}$$

Where

n=minimum sample size

z=standardized normal deviation which is equally to 1.96 (at 95% confidence interval)

P= estimate of population prevalence equal to 10% (Ministry of health, 2015).

e= estimated error equal to 5%

$n=\frac{1.96^2 \times 0.10(1-0.10)}{0.05^2}$

n=138

3.7. DATA COLLECTION METHODS AND PROCEDURES

3.7.1. Data Collection

After getting ethical clearance from the University of KIBOGORA POLYTECHNIC and approval from NYABITIMBO Health Center. We were used recorded book files which helped to get data needed.

3.7.2. THE PROCEDURE

We used Nyabitimbo health center records, and then we collected all data regarding our project such as chemistry of urine like urine albumin, pregnancy test result, clinical history of the patients and patient's identification like: lab code, age, sex.

After getting the data mentioned above, we analysed the data

3.8. DATA ANALYSIS

The Data of Albuminuria was analyzed by Microsoft excel and SPSS programs; The Data was presented using percentages. After the results were presented in the form of tables, and graphs.

3.9. RELIABILITY AND VALIDITY OF DATA

Consent files for data collection used following defined criteria. The client's file remained confidentiality, and the finding results are used only in research purpose. No data will be used without authorization of KIBOGORA POLYTECHNIC UNIVERSITY, and the administration of NYABITIMBO HEALTH CENTER.

3.11. ETHICAL CONSIDERATION

This research was conducted under Kibogora Polytechnic University approval. The collection of data was conducted after obtaining the permission of KIBOGORA POLYTECHNIC University, and NYABITIMBO health center representatives. The collected information will be used only for research purpose with high confidentiality, and identity and the file of the client will remain confidential.

CHAPTER FOUR: DATA PRESENTATION, ANALYSIS,

INTERPRETATION, DISCUSSION, AND SUMMARY

4.0 INTRODUCTION

In 138 client files reviewed, were focused on pregnant women requested albuminuria test. The research found the pregnant women to be more affected by Albuminuria than pregnant women without Albuminuria were received at NYABITIMBO Health Center. This chapter presents client's social demographic characteristics and presenting findings.

4.1: PRESENTATION OF FINDINGS AND INTERPRETATION

Table 1: Pregnant women requested Albuminuria test result

Albuminuria result	Frequency	Percent	Cumulative Percent
Positive	20	14.5	14.5
Negative	118	85.5	100.0
Total	**138**	**100.0**	

The above table shows the pregnant women albuminuria test result, the pregnant women with Albuminuria was 20 (14.49%) with the prevalence, and the pregnant women without Albuminuria was 118 (85.51%) with the prevalence.

FIGURE 1: Pregnant women requested Albuminuria test result presented in bar chat.

Table 2: Distribution of the pregnant Women with Albuminuria test according to age

Age	Frequency	Percent	Cumulative Percent
19-24	16	11.6	11.6
24-29	30	21.7	33.3
29-34	42	30.4	63.8
34-39	32	23.2	87.0
39-44	18	13.0	100.0
Total	**138**	**100.0**	

The above table 2 shows the number of pregnant women attends in NYABITIMBO Health Center during April to May 2019, in the following ascending range of age's from19 to 24 years had11.59% prevalence, 39 to 44 years had 13.04%prevalence, 24 to 29years had 21.74% prevalence, 34 to 39 years had 23.19%prevalence, and 29 to 34 years had 30.43%prevalence, as the figure below show us.

FIGURE 2: Distribution of the pregnant women requested Albuminuria test according to age in bar chat

Table 3: The number of pregnant women with albuminuria and the pregnant women without albuminuria according to the range of age.

Result according to age	Frequency	Percent	Cumulative Percent
19-24 with Positive	5	3.6	3.6
19-24 with Negative	11	8.0	11.6
24-29 with Positive	8	5.8	17.4
24-29 with Negative	22	15.9	33.3
29-34 with Positive	6	4.3	37.7
29-34 with Negative	36	26.1	63.8
34-39 with Positive	1	0.72	64.5
34-39 with Negative	31	22.5	87.0
39-44 with Negative	18	13.0	100.0
Total	**138**	**100.0**	

According to the above table 3 and figure 3 below, the result shows more infected pregnant women with albuminuria occur in the range between 24 to 29 years was 8 with prevalence 5.80%,29 to 34 years was 6 with prevalence 4.35%, and 19to 24 years was 5 with prevalence 3.62%. That range says, those pregnant women are at high risk to develop pre-eclampsia, oedema, and kidney failure. In the range between 34 to 39years, and 39 to 44 years of pregnant women, they are not more infected with Albuminuria.

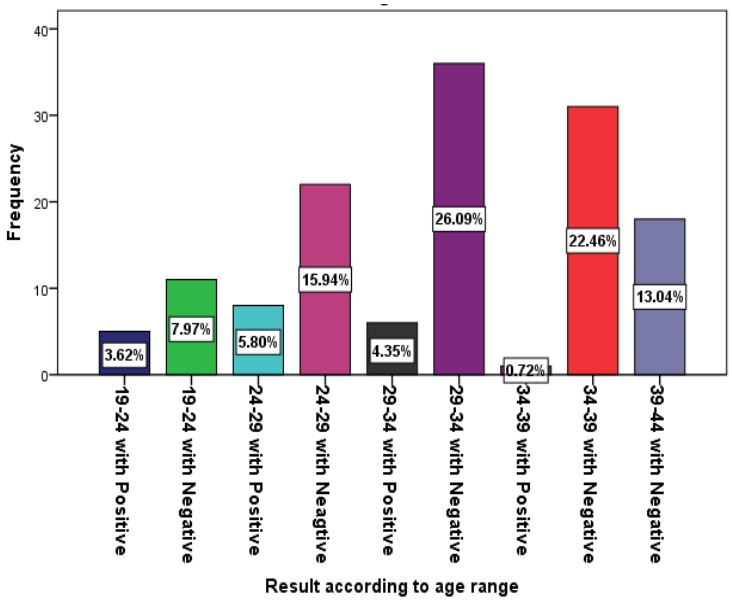

Figure 3: The number of pregnant women with albuminuria and the pregnant women without albuminuria according to the range of age

Table 4: Factors associated with albuminuria among pregnant women.

Factors	Frequency	Percent	Cumulative Percent
Kidney failure	12	60.0	60.0
Obesity	5	25.0	85.0
Other factors	3	15.0	100.0
Total	**20**	**100.0**	

The table 4 above and figure 4 below shows the factors associated with albuminuria among pregnant women , where Pregnant women have kidney disease was 12(60%) with prevalence , obesity was 5 (25%) with prevalence and other factors was 3 (15%) with prevalence. Based on our study we have seen the pregnant women with kidney failure are more capable to excrete albumin in urine than other factors.

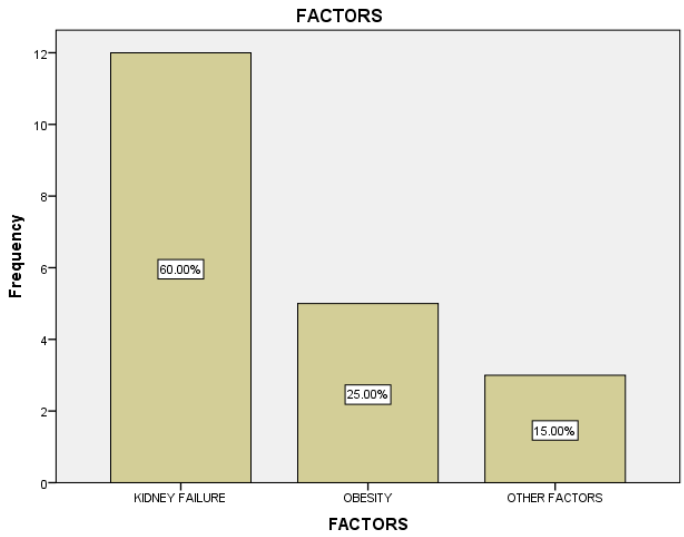

Figure 4: Factors associated with albuminuria among pregnant women

Table 5: Complications of albuminuria among pregnant women

Complications	Frequency	Percent	Cumulative Percent
Preeclampsia	8	40.0	40.0
Edema	5	25.0	65.0
liver failure	7	35.0	100.0
Total	20	100.0	

The table 5 above and figure 5 below shows complication of albuminuria among pregnant women, pregnant women have preeclampsia was 8 with 40% prevalence, edema was 5 with 25% prevalence and liver failure was 7 with prevalence 35%. When those complication are not

managed will cause death for both mother and fetus and child impairment.

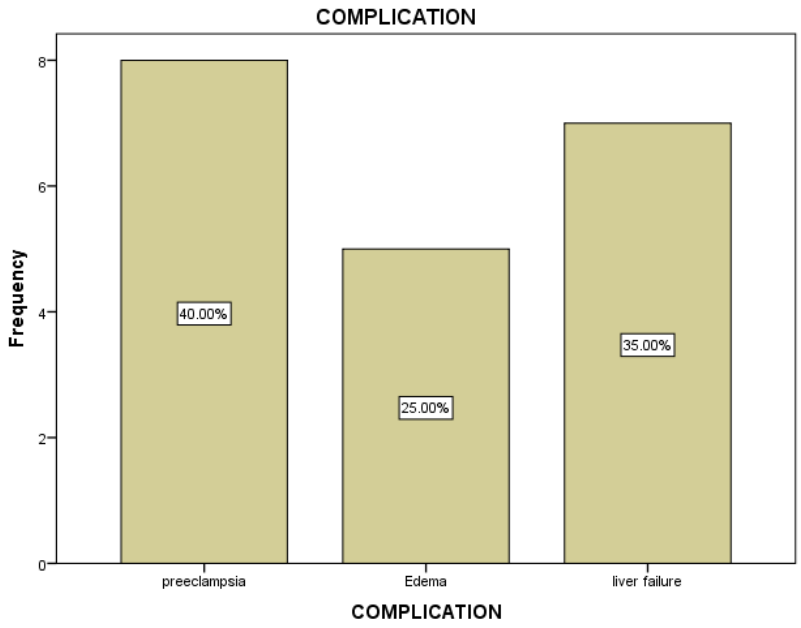

Figure 5: Complications of Albuminuria among pregnant women

4.2. DISCUSSIONS OF FINDINGS

Our study shows pregnant women with albuminuria have prevalence 14.5%, while Albumin leaking into the urine combined with high blood pressure defines pre-eclampsia, a condition affecting 2-8% of pregnancies in the UK (Co-operative & Oxford, 2014). It means that in Rwanda still having the problem of albuminuria in pregnant women. Rwanda Ministry of health may increase efforts and strategy in managing those problems among pregnant women.

The most common pregnancy-related complications are hypertensive disorders (pre-eclampsia, eclampsia, and pregnancy-induced hypertension. According to the WHO, hypertensive disorders during pregnancy account for 9% of maternal mortality in Africa and Asia 5.8 %. Pre-eclampsia, characterized by hypertension and proteinuria, complicates 3%–5% of pregnancies worldwide(DORTE M. JENSEN, PETER DAMM, 2010).

According to our study shows 40% prevalence of preeclampsia is greater than the prevalence above in literature review.

4.3. SUMMARY OF FINDINGS

Albuminuria is the presence of protein in the urine. Albuminuria assessment is a key test in pregnancy to evaluate renal and systemic well-being. (Cassia et al., 2018).

Depend on the complications of albuminuria, when it is not treated or managed can cause death, especially for pregnant women and fetus or child impairment. Study did show the prevalence of pregnant women with Albuminuria was lower than the prevalence of pregnant women without Albuminuria. The factors associated with albuminuria are kidney failure, obesity and other factors, based on that factors those clients are capable to excrete albumin in urine.

Pregnant women with Albuminuria were 20 (14.5%) with prevalence, and pregnant women without Albuminuria were 118 (85.5%) with prevalence. On 138 of pregnant women occur in five parts based on age: between 19 to 24 years were11.6%, between 24 to 29 years were 21.7%, between29 to 34 years were 30.4%, between 34 to 39 years were 23.2%, between39 to 44 years were 13%, according to albuminuria was ascending range of ages from 39 to 44 years, 34 to 39 years, 19 to 24 years, 29 to 34 years, and 24 to 29years. Measurements should be taken to avoid those problems are to encourage the pregnant women to have nutritional supplementation, antenatal care, life style, and anticonvulsant drug (magnesium sulfate). Diuretics are the drug that stimulates water and sodium excretion, so that urine volume increased. The commonly used diuretic is bendrofluozide, fruazide, frusemide, spironolactone, and mannitol. Diuretics are important in the treatment of edema, heart failure, and hypertension.

CHAPTER FIVE: CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

The outcome of our study points out that Albuminuria is associated with pregnant women.

The pregnant between 29 to 34 years and between 34 to 39years are more affected by albuminuria depends on some factors like kidney failure, obesity, family history etc…

Some of the measures should be taken to remove that problem are to encourage the pregnant women to take nutritional supplementation, antenatal care, life style, and anticonvulsant drug. This is in agreement with the findings that anticonvulsant drug reduces preeclampsia caused by Albuminuria within pregnant women. The only etiologic treatment of preeclampsia is fetus and placenta delivery. Timing of delivery must take into account the gestational age, severity of preeclampsia, as well as maternal and fetal conditions. Current treatments aim at avoiding maternal complications such as cerebral hemorrhage, pulmonary edema, and eclampsia. Treatment is essentially based on antihypertensive therapy, and magnesium sulfate (MgSO4).

(L et al., 2014)

5.2. RECOMMENDATIONS

5.2.1. To Rwanda Ministry of health

We suggest doctors and nurse to continue screening all pregnant women for albuminuria whole the entire period of pregnancy because albuminuria may develop to any stage of pregnancy, particularly in second and third trimester.

5.2.2. To NYABITIMBO Health Center

Evaluation, and advice for pregnant women, especially for the pregnant women between 29 to34 years, and 34 to 39 years old, train health practitioners about guidelines.

5.2.3. To kibogora polytechnic university

Administration of KP may increase the time of working research project for students.

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APPENDICES

APPENDIX I.RESULT OBSERVATION

NO	LAB CODE	SEX	AGE	ALBUMINURIA
1	1542	F	30	NEGATIVE
2	1534	F	29	NEGATIVE
3	1535	F	37	NEGATIVE
4	1537	F	31	NEGATIVE
5	1539	F	27	NEGATIVE
6	1546	F	34	NEGATIVE
7	1548	F	33	TRACE
8	1559	F	38	NEGATIVE
9	1560	F	31	NEGATIVE
10	1561	F	30	NEGATIVE
11	1562	F	32	NEGATIVE
12	1563	F	25	NEGATIVE
13	1564	F	40	NEGATIVE
14	1565	F	25	NEGATIVE
15	1566	F	26	NEGATIVE
16	1567	F	31	NEGATVE
17	1568	F	28	NEGATIVE
18	1575	F	30	NEGATIVE
19	1573	F	26	NEGATIVE
20	1642	F	24	NEGATIVE
21	1644	F	28	NEGATIVE
22	1646	F	28	TRACE
23	1648	F	21	NEGATIVE
24	1650	F	41	NEGATIVE
25	1652	F	32	TRACE
26	1662	F	33	NEGATIVE
27	1677	F	36	NEGATIVE
28	1681	F	32	NEGATIVE
29	1673	F	25	NEGATIVE
30	1679	F	30	NEGATIVE
31	1685	F	33	NEGATIVE
32	1686	F	30	NEGATIVE
33	1687	F	36	TRACE
34	1688	F	29	TRACE
35	1767	F	38	NEGATIVE
36	1768	F	21	NEGATIVE

37	1769	F	27	NEGATIVE
38	1770	F	25	NEGATIVE
39	1771	F	21	NEGATIVE
40	1772	F	24	NEGATIVE
41	1773	F	27	NEGATIVE
42	1774	F	22	NEGATIVE
43	1775	F	33	NEGATIVE
44	1776	F	25	TRACE
45	1777	F	30	TRACE
46	1778	F	32	NEGATIVE
47	1779	F	37	NEGATIVE
48	2022	F	21	NEGATIVE
49	2024	F	30	NEGATIVE
50	2026	F	32	NEGATIVE
51	2028	F	32	NEGATIVE
52	2029	F	25	NEGATIVE
53	2031	F	32	NEGATIVE
54	2033	F	25	NEGATIVE
55	2035	F	31	NEGATIVE
56	2048	F	28	TRACE
57	2050	F	35	NEGATIVE
58	2051	F	20	TRACE
59	2052	F	41	NEGATIVE
60	2053	F	32	NEGATIVE
61	2054	F	22	NEGATIVE
62	2063	F	20	NEGATIVE
63	2065	F	41	NEGATIVE
64	2102	F	32	NEGATIVE
65	2104	F	31	NEGATIVE
66	2108	F	25	TRACE
67	2130	F	33	NEGATIVE
68	2127	F	20	NEGATIVE
69	2128	F	37	NEGATIVE
70	2129	F	20	NEGATIVE
71	2131	F	39	NEGATIVE
72	2132	F	40	NEGATIVE
73	2133	F	20	TRACE
74	2136	F	23	NEGATIVE
75	2150	F	25	NEGATIVE

76	2157	F	26	TRACE
77	2160	F	31	TRACE
78	2163	F	23	TRACE
79	2165	F	30	NEGATIVE
80	2180	F	40	NEGATIVE
81	2181	F	23	NEGATIVE
82	2182	F	22	NEGATIVE
83	2183	F	30	NEGATIVE
84	2189	F	32	NEGATIVE
85	2185	F	25	NEGATIVE
86	2186	F	34	NEGATIVE
87	2187	F	30	NEGATIVE
88	2188	F	36	NEGATIVE
89	2189	F	23	NEGATIVE
90	2190	F	33	NEGATIVE
91	2377	F	37	NEGATIVE
92	2390	F	30	NEGATIVE
93	2391	F	31	NEGATIVE
94	2392	F	21	NEGATIVE
95	2395	F	30	TRACE
96	2394	F	25	TRACE
97	2396	F	19	NEGATIVE
98	2401	F	27	NEGATIVE
99	2402	F	32	NEGATIVE
100	2408	F	32	NEGATIVE
101	2417	F	32	NEGATIVE
102	2419	F	22	NEGATIVE
103	2267	F	19	NEGATIVE
104	2268	F	19	TRACE
105	2269	F	24	NEGATIVE
106	2270	F	26	NEGATIVE
107	2271	F	26	NEGATIVE
108	2273	F	33	NEGATIVE
109	2274	F	31	NEGATIVE
110	2283	F	32	NEGATIVE
111	2284	F	20	NEGATIVE
112	2285	F	19	NEGATIVE
113	2295	F	25	NEGATIVE
114	2300	F	20	NEGATIVE

115	2441	F	25	NEGATIVE
116	2451	F	33	NEGATIVE
117	2459	F	30	NEGATIVE
118	2500	F	36	NEGATIVE
119	2506	F	19	NEGATIVE
120	2499	F	38	NEGATIVE
121	2501	F	32	NEGATIVE
122	2508	F	27	TRACE
123	2502	F	21	TRACE
124	2503	F	24	NEGATIVE
125	2504	F	26	NEGATIVE
126	2508	F	22	NEGATIVE
127	2509	F	33	NEGATIVE
128	2510	F	25	NEGATIVE
129	2511	F	34	NEGATIVE
130	2513	F	32	NEGATIVE
131	2514	F	37	NEGATIVE
132	2529	F	21	NEGATIVE
133	2532	F	30	NEGATIVE
134	2535	F	32	NEGATIVE
135	2536	F	25	NEGATIVE
136	2538	F	41	NEGATIVE
137	2531	F	28	NEGATIVE
138	2541	F	30	TRACE

APPENDIX. II. Authorization letter

KIBOGORA POLYTECHNIC

STUDENT PROJECT'S LETTER

DATE **16th .JULY.2019**

To whom it may concern;

We write this letter to humbly request you to allow Miss NAHIMANA Janviere and MUKAGATARE Bernadette to conduct project work at NYABITIMBO HEALTH CENTER

The above mentioned is bonafide student of Kibogora Polytechnic pursuing Bachelor's degree in Biomedical Laboratory Sciences.

This candidate is currently conducting a project entitled **prevalence of albuminuria among pregnant woman attending at Nyabitimbo health center.**

We are convinced that your institution will constitute a valuable source of information pertaining to their work. The purpose of this letter is to humbly request you to avail them with the pertinent information they may need. We pledge to ensure that all provided information will be used in the strict academic purpose.

Any assistance rendered to the candidate will be highly appreciated.

Approved by:

for **MUNYANDAMUTSA Fulgence**

Head of department/Biomedical Laboratory Sciences

Kibogora Polytechnic

Dr Sophie Uwamariya
AVC KP

Recue. Le 17/7/2019

Approved by UWAMARIYA Laurence

IKIGO NDERABUZIMA CYA NYABITIMBO - AKARERE KA RUSIZI