Sudan university of science &technology

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Assessment of lipid Profile and Microalbuminuria in Sudanese Patients with Renal Transplant in Khartoum State

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بولاية الخرطوم

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قال الله تعالى

بسم الله ا لرحمن الرحيم

(اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ{1} خَلَقَ الْإِنسَانَ مِنْ عَلَقٍ{2} اقْرَأْ وَرَبُّكَ الْأَكْرَمُ{3} الَّذِي عَلَّمَ بِالْقَلَمِ{4} عَلَّمَ الْإِنسَانَ مَا لَمْ يَعْلَمْ)

صدق الله العظيم

في سورة العلق الاية (1-5)

Dedication

To my mother……

To my father ……..

To my brother …….

To my sister……

To my friends…

To my colleagues…….

Acknowledgments

All my thanks are in the name of Allah, the most Gracious and the most Merciful.

In this instance ,I extended my thanks ,deep sincere gratitude and honest appreciation to my supervisor DrNoon,babiker Department of ,clinical chemistry ,Sudan university of science and technology, for her kindness, good guidance ,valuable direction and generous advice that has kept me on the right track.

My thanks are also extended to my colleagues in the clinical chemistry Department, collage of medical laboratory Science Sudan University of Science and technology for their kind stand and support .

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Abstract

Background:Kidney transplantation is treatment for many patients who have or are developing end-stage renal disease and who are undergoing, chronic dialysis therapy. However transplant is not the best treatment for all patients.and transplant patient are suffering from many abnormalities that affect tissue transplant .e.g(lipid profile and microalbuminuria.)

Objective:to asses lipid profile and microalbuminuria in sudanese patient with renal transplant in khartoum state

Material and methods: this is cross sectional study ,the study was conducted from May to July ,and 100 sample from renal transplanted patient chosen randmly fromSudanese renal transplanted association, 50 with normal value used as control .all sample were tested for lipid profile and microalbuminuria used cobas and the result were analyzed using statistical of package social science(spss),computer program.

Result: the study showed that the level of HDL was significantly decrease mean(40.432±11.8352 ,P=.04.000) and significant increase in microalbuminuria (ACR)mean (207.55±55.534 P .00))in renal transplant patient

And insignificant in LDL(P=.06)mean (95.740±35.1562),TG(P=.1)mean (126.456±73.1171) and CH(P=.6)mean(163.508±50.7440).

And insignificantofLDL(P=.9),HDL(P=.1),TG(P=.5),CH(P=.5),and microalbuminuria (ACR)(P=.5) when correlation to duration of renal transplantation.

Conclusion:from the result of this study,it concluded that:the level of HDLwas significant decrease , ACR was significantly increased in renal transplanted patient and insignificant of LDL,TG and CH.

Also insignificant of TG,LDL,HDL,CH,and microalbuminuria (ACR)when correlation with duration.

المستخلص

خلفية: زارعه الكلى هي العلاج للكثير من المرضى الذين تتطور لديهم مرض الكلي ،والذين خضعوا لغسيل الكلى المزمن. ومع ذلك الزراعه ليس هي أفضل علاج لجميع المرضى. ومريض الزراعه يعاني من العديد من التشوهات التي تؤثرعلي كميه الدهون و والبول الزلالي الدقيق .

الهدف: قياس مستوى الدهون في الدم وكميه البروتين الزلالي في البول لمعرفة تأثيرالزمن علي زارعة الكلى.

المواد والطرق : قدأجريت الدراسة في الفترة من مايو حتى يوليو،تم اختيار100عينة من زارعي الكلي من مركز جمعية زارعي الكلي , خمسين عينه منهم مع نتايج طبيعيه استخدمة كعينة تحكم. جميعها تم اختبارها لقياس مستوى الدهون في الدم والبول الزلالي الدقيق بواسطه جهاز كووبس والنتيجة تم تحليله بواسطة برنامج الحزمه الاحصائيه للعلوم الاجتماعيه.

النتيجة: أظهرت الدراسة أن هنالك انخفاض في مستوى البروتين الدهني عالي الكثافه وكان الاحتمال الاحصائي للمقارنه (04 ,) (40,434 ± 835, 11) وارتفاع في مستوى البول الزلالي الدقيق وكان الاحتمال الاحصائي للمقارنه(00,) (207,55 ± 534, 55).وأظهرت الدراسه ان هنالك زياده في مستوى البروتين الدهني منخفض الكثافه (06,) (740 , 95 ± 156, 35)والجلسريدات الثلاثيه (1,) (126,456± 73,117)والكولسترول الكلي (6,) (508, 163 ± 50,744).

كما اظهرت الدراسه ليس هنالك علاقه بين (والبول الزلالي الدقيق(5,)البروتين منخفض الكثافه(9,) والعالي الكثافه(1,) الكولسترول الكلي (5,) والثلاثي الجلسريدات(5,)ومدة زراعه الكلى.)

الخلاصة: خلصت هذه الدراسه ان هنالك انخفاض في مستوي البروتين الدهني عالي الكثافه و ارتفاع ملحوظ في مستوى البول الزلالي الدقيق و زياده في مستوى البروتين الدهني منخفض الكثافه والكلسترول الكلي وثلاثي الجلسريدات.

كما اظهرت الدراسه ليس هنالك علاقه بين (البروتين في البول ,البروتين منخفض الكثافه والعالي الكثافه والكولسترول الكلي والثلاثي الجلسريدات)ومدة زراعه الكلى

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ACR	albumin creatinine ratio
CH	cholesterol
HDL	high density lipoprotein
LDL	low density lipoprotein
TG	triglycerid

1-Introduction

Kidney transplantation is the preferred treatment option for many patients who have or are developing end-stage renal disease and who are undergoing, chronic dialysis therapy. However transplant is not the best treatment for all patients,(Clinical Guideline,2015).

The transplanted kidney takes over the work of two kidneys that failed so you no longer need dialysis .during the transplant the surgeon places the new kidney in your lower abdomen and connects the artery and vein of new kidney to your artery and vein ,often the new kidney will start making urine as soon as your blood starts flowing through it .but sometimes it takes a few weeks to start working, (National institutes of health,2015.).

Dyslipidemia is common in patients with renal disease](Attman PO, Samuelsson D et al,1993).(Markel MS et al,1994), Atherogenic changes in the level and composition of lipoproteins that are recognized as risk factors for cardiovascular diseases (CVD) in the general population occur in a majority of patients with renal disease .(-.Massy ZA, Kasiske BL,1996),(Mittman N, Avram MM,1996),(Sutherland WHT,1995). The reported prevalence of dyslipidemia in renal transplant patients ranges from 16-72% depending on the patient population and the time point after transplantation when serum lipids were examined . (Catin SD, et al,1994).

Albumin is protein .albuminuria is having too much protein in the urine this is some time referred to as microalbuminuria which indicate slightly high level of protein in the urine .overt protienuria or macroalbuminuria indicate more than 300mg of albumin in urine per day .

Persistent albuminuria mean that the kidney has some damage and starting to spill some albumin into urine . (Evans, J. (2012).

1.2 Rationale:

Kidney transplantation is treatment for minarity of patients with end stage renal disease . However transplant is not the best treatment for all patients.and transplant patient are suffering from many abnormalities that affect tissue transplant .e.g(lipid profile and microalbuminuria.) and Abnormality of serum lipid profile and microalbuminuria has recently been investigated as marker or prognostic indicator in patients with renal transplant to detect early rejection of tissue. .

1.3 Objective :

1.3.1General objective:

To asses lipid profile and microalbuminuria in sudanese patient with renal transplant in khartoum state.

1.3.2 Specific objective:

To measure lipid profile in blood sample and microalbuminuria(ACR) in urine sample in renal transplant patient.

To find relationship between lipid profile,microalbuminuria and duration of renal transplanted.

2. Literature review

2.1Renal failure:

Renal failure is a condition in which the kidneys fail to remove metabolic end-products from the blood and regulate the fluid, electrolyte, and pH balance of the extra systemic disease, or urologic defects of non-renal origin.

2.1.1Type of renal faliure :

a- Acute renal failure is abrupt in onset and often is reversible if recognized early and treated appropriately.

b-chronic renal failure is the end result of irreparable damage to the kidneys. It develops slowly, usually over the course of a number of years (Levy E.M,et al,1996).

Acute renal failure represents a rapid decline in renal function sufficient to increase blood levels of nitrogenous wastes and impair fluid and electrolyte balance. It is a common threat to seriously ill persons in intensive care units, with a mortality rate ranging from 42% to 88% Although treatment methods Although treatment methods such as dialysis and renal replacement methods are effective in correcting life-threatening fluid and electrolyte disorders the mortality rate associated with acute renal failure has not changed substantially since the 1960s such as dialysis and renal replacement methods are effective such as dialysis and renal replacement methods are effective in correcting life-threatening fluid and electrolyte disorders, the mortality rate associated with acute renal failure has not changed substantially since the 1960s. (..Thadhani R.et al,1996),(Brady H.R.et al,2000).

2.1.2 Types of Acute Renal Failure:

Acute renal failure can be caused by several types of conditions, including a decrease in blood flow without ischemic injury ischemic, toxic, or obstructive tubular injury; and obstruction of urinary tract

outflow. The causes of acute renal failure commonly are categorized as

pre-renal (55% to 60%), post-renal(5%), and intrinsic (35% to 40%)(Brady H.R.et al,2000).

a.Pre-renal failure:

The most common form of acute renal failure is characterized by a marked decrease in renal blood flow. It is reversible if the cause of the decreased renal blood flow can be identified and corrected before kidney damage occurs. Causes of pre-renal failure include profound depletion of vascular volume (e.g, hemorrhage, loss of extracellular fluid volume), impaired perfusion caused by heart failure and cardiogenic shock, and decreased vascular filling because of increased vascular

capacity (e.g, anaphylaxis or sepsis). Elderly persons are particularly at risk because of their predisposition to hypovolemia a and their high prevalence of renal vascular disorders,(Brady H.R.et al,2000).

b.Post-renal Failure:

Post-renal failure results from obstruction of urine outflow fromthe kidneys. The obstruction can occur in the ureter (i.e. , calculi and strictures), bladder (i.e. , tumors or neurogenic bladder), or urethra (i.e. , prostatic hypertrophy). Prostatic hyperplasia is the most common underlying problem. Because both ureters must be occluded to produce renal failure, obstruction of the bladder rarely causes acute renal failure

unless one of the kidneys already is damaged or a person has only one kidney. The treatment of acute postrenal failure consists of treating the underlying cause of obstruction so that urine flow can be re-established before permanent nephron damage occurs12-13),(Brady H.R.et al,2000),(CotranR.S,et al,1999).

c.Intrinsic Renal Failure:

Intrinsic or intrarenal renal failure results from conditions that cause

damage to structures within the kidney—glomerular tubular, or

interstitial. Injury to the tubules is most common and often is ischemic

or toxic in origin. The major causes of intrarenal failure are ischemia associated with prerenal failure toxic insult to the tubular structures of the nephron, and in tratubular obstruction. Acute glomerulonephritis and acute pyelonephritis also are intrarenal causes of acute renal failure12-13),(Brady H.R.et al,2000),(CotranR.S,et al,1999).

2.1.3chronic renal failure:

Unlike acute renal failure, chronic renal failure represents progressive and irreversible destruction of kidney structures. any patients with chronic renal failure progressed to the final stages of the disease and then died(14) (National Kidney and Urological Information Center,2001).

Chronic renal failure can result from a number of conditions that cause permanent loss of nephrons, including diabetes, hypertension, glomerulonephritis, and polycystic kidney disease,(Brady H.R.et al,2000).

2.2Kidney transplantation:

is the preferred treatment option for many patients who have or are developing end-stage renal disease and who are, or will be undergoing, chronic dialysis therapy. However transplant is not the best treatment for all patients.(Clinical Guideline,2015).

The transplanted kidney takes over the work of two kidneys that failed so you no longer need dialysis .during the transplant the surgeon places the new kidney in your lower abdomen and connects the artery and vein of new kidney to your artery and vein ,often the new kidney will start making urine as soon as your blood starts flowing through it .but sometimes it takes a few weeks to start working, (National institutes of health,kidney,2015).

2.2.1 type of transplant donors recipient may receive:

a-Living donor:

Provides excellent health of a donor kidney, improved long term survival, and the ability to receive a transplant in a timely manner. The live donor is usually a family member or a friend. Medical assessments are conducted to determine whether the donor is a compatible and healthy match for the transplant .

If there is matched living donor who has given informed consent, they are called a compatible pair.

The time of transplant surgery is scheduled based on the availability and wish of

the donor and the best possible health of the recipient and operating times available.

b-Paired Exchange:

Thirty percent of potential kidney donors are suitable but not compatible with the intended recipient. This means the donor's blood type is not compatible with the recipient's blood type or the recipient has antibodies that will reject that donor's kidney. Suitable kidney donors who are incompatible with their recipients will be given the option of entering into the Canadian Living Donor Paired Exchange Program (LDPE). This registry attempts to find exchange combinations so that the intended recipient can receive a compatible kidney and donor can donate to a compatible recipient.

c-Deceased Donor:

Deceased donor transplant occurs when a kidney is donated by someone who has

died very recently in hospital and the family and appropriate consent for donation

has been given. Approved transplant candidates who do not have potential living donors are placed on a waiting list for these organs. (Clinical Guidelines ,2015).

2.2.2 preparation of renal transplantation:

-for a transplant from a living donor, members of the transplant team will:

• Discuss living donor transplantation with the recipient.

• Encourage discussion between potential donors and the recipient.

• Describe in detail the procedure, implications, risks and benefits to the intended donor .

• Take blood samples for ABO, HLA typing, virology and initial cross match to identify the optimal donor match.

• Encourage the donor to carefully consider the decision to donate before proceeding and discuss all questions fully .

• Perform the evaluation which covers all medical, surgical, social and psychological aspects.

• Book the surgery.

• Repeat the cross match prior to surgery

2.2.3 suitable deceased kidney donor:

• Is normally less than 70 years of age.

• Has no evidence of irreversible renal dysfunction .

• Has no known risk factors for transmission of disease to the recipient.

• Has no known transmittable disease or malignancy(Clinical Guidelines,2015).

2.2.4 post transplantation:

Complication in early post-operative phase:

Major Complications which can occur in the early post-operative phase include:

Delayed graft function (DGF) infection Graft rejection

a.Delayed Graft Function :

Poor initial graft function occurs in less than 5% of living donor recipients

and less than 20% of deceased donor recipients.

The patient is normally oliguric, although non-oliguric renal dysfunction may occur. When the transplanted kidney is not functioning it is critical to exclude arterial or venous occlusion and urinary obstruction or leak. This is determined by an urgent ultrasound with Doppler to assess kidney flow. Patients with surgical problems may need urgent reoperation. The overwhelming majority of kidney grafts with poor function may simply have a delay in graft function. Dialysis will be instituted and fluid and dietary restrictions are commenced as appropriate. All medications requiring dosage adjustments for renal failure are reviewed.

b.Infection

Infection remains an important cause of morbidity and mortality following transplantation, although the use of prophylactic antibiotic therapy at the time of surgery has markedly decreased these risks. Infection occurs in up to 30% of renal transplant recipients during the first three months after transplant. Early diagnosis and appropriate treatment are essential.

-.bacterial infection:

Most common during the first four weeks post-transplant. Infection may occur at the wound site, in the urinary tract, or in the lung. If inadequately treated, local infection may rapidly progress to systemic sepsis, particularly in diabetic patients.

-Viral infection:

Usually seen between 4 to 26 weeks after transplant, particularly in individuals treated with anti-thymocyte globulin. The principal viral infections are:

• Herpes simplex (HSV) stomatitis Cytomegalovirus (CMV) infection

(Clinical Guidelines ,2015)

2.2.5Standing lab orders:

Routine Tests (Pre-clinic)

Blood work: Prior to each clinic visit, patients should have the following routine blood work done:

• CBC (Hgb, platelets, WBC, differential)

• K, Na, Cl, CO_2, Ca, PO_4

• Glucose (fasting)

• Creatinine, urea

• Total and direct bilirubin

• Liver enzymes – alkaline phosphatase, ALT, AST

• Albumin

Cyclosporine: Cyclosporine blood concentrations are required for patients on cyclosporine. Blood concentrations taken two hours post cyclosporine dose (C_2) are preferred over trough levels. Tacrolimus: Trough levels are required for patients on tacrolimus.

Sirolimus: Trough levels are required for patients on sirolimus.

Fasting Blood Sugar and HgA1C: All patients should have fasting blood sugars done with all of their bloodwork in the first 6 weekspost-transplant and then at least every 3 months. All diabetic patients should have an HgA1C done every three months. HBA1C testing is not recommended for screening in non-diabetics.

Lipid studies: All patients should have lipid studies (total cholesterol, LDL, HDL and triglycerides) done every 6 months post-transplant.

Urine tests: Prior to each clinic visit patients should have a routine urine culture and sensitivity (C and S) test, urinalysis and urine albumin creatinine ratio (ACR). ACR replaces the 24 hour urine.

If the values are abnormal, then follow-up tests may be done at more frequent intervals.(Clinical Guidelines,2015).

2.3Lipid profile:

Dyslipidemia is common in patients with renal disease, there is direct relation between dyslipidemia and renal transplant patient (Attman PO, Samuelsson D et al,1993).(Markel MS et al,1994) depending on the patient population and the time point after transplantation when serum lipids were examined (Catin SD, et al,1994).

Two types of lipids, cholesterol and triglycerides are transported in the blood by lipoprotein particles. Each particle contains a combination of protein, cholesterol, triglyceride, and phospholipids molecules.

.A lipid profile measures the level of specific lipids in the blood.

The particles measured with a lipid profile are classified by their density into high-density lipoproteins (HDL), low-density lipoproteins (LDL), and very low-density lipoproteins (VLDL).

A lipid profile typically includes:

-Total Cholesterol: This test measures all the lipids in the blood. A level of less than 200 mg/dL is desirable.

-Serum Triglycerides: This test measures all the triglycerides in all the

lipoprotein particles; most is in the very low-density lipoproteins

(VLDL). A level of less than 150 mg/dL is considered desirable. -High-density lipoprotein cholesterol (HDL-C): HDL – cholesterol measures the cholesterol in HDL particles; often called "good cholesterol" because it removes excess cholesterol and carries it to the liver for removal. An HDL – cholesterol level between 40 and 60 mg/dL is considered normal increase concentration of HDL particle are strongly associated with decreasing accumulation of atherosclerosis within the wall of arteries (american heart, 2009).

-Low-density lipoprotein cholesterol (LDL-C) — calculates the cholesterol in LDL particles; often called "bad cholesterol" because it deposits excess cholesterol in walls of blood vessels,

which can contribute to atherosclerosis. Usually, the amount of LDL cholesterol (LDL-C) is calculated using the results of total cholesterol, HDL-C, and triglycerides. Normal range 100-129 mg/dl .(YunpingQiu et al 2013).

2.4.Microalbuminuria:

predicts graft loss and all-cause mortality in renal transplant recipients. In the general population, it clusters with both traditional cardiovascular risk factors and elevated C-reactive protein (CRP). Our objective was to define the relationship between microalbuminuria and these risk factors in

stable renal transplant recipients (.Prasad GV[1], Bandukwala F, Huang M et al 2009).

Microalbuminuria is a term to describe a moderate increase in the level of urine albumin. It occurs when the kidney leaks small amounts of albumin into the urine, in other words, when there is an abnormally high permeability for albumin in the glomerulus of the kidney. The term 'microalbuminuria' is now discouraged by KDIGO (Kidney Disease Improving Global Outcomes).

he level of albumin protein produced by microalbuminuria can be

detected by special albumin-specific urine dipsticks. A microalbumin urine test determines the presence of the albumin in urine. In a properly functioning body, albumin is not normally present in urine because it is retained in the bloodstream by the kidneys.(Person,2007) .

Microalbuminuria can be diagnosed from a 24-hour urine collection (between 30–300 mg/24 hours) or, more commonly, from elevated concentrations in a spot sample (30 to 300 mg/L). Both must be measured on at least two of three measurements over a two- to three-month period , (.Prasad GV[1], Bandukwala F, Huang M et al 2009).

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The test is typically used in conjunction with a creatinine test to provide an albumin-to-creatinine ratio. Creatinine is a waste product in the blood

that should be removed by the kidneys. When kidney damage occurs, creatinine levels in the urine decrease while albumin levels may increase.

The microalbuminuria test is also known as:

the ACR test -

-The albumin-to-creatinine ratio test .

-The urine albumin test There are two types of microalbuminuria tests. The first can be administered in any healthcare setting. It requires you to provide a urine sample. The sample is collected in a sterile cup and sent to a laboratory for analysis. Once the lab reports the results, your doctor will be able to provide you with more information about the results and what they mean.

The second microalbuminuria test involves the collection of a 24-hour urine sample. To complete this test, you will be required to collect all of your urine for a 24-hour period. Your doctor will provide you with a container for urine collection that must be kept in the refrigerator. Once you have collected your urine for 24 hours, you will need to return the sample to your healthcare provider for laboratory analysis. Your doctor will be able to explain the results to you after the analysis is complete. (Darla Burke,2012)

The results of the microalbuminuria test will vary, depending on the laboratory where the sample was analyzed. Normal values are typically less than 30 mcg/mg (micrograms per milligram). A low level of albumin in the urine is an indication that your kidneys are functioning normally.

If an abnormal result is reported, your doctor will have you complete the microalbuminuria test again to confirm the results. Dehydration and high levels of exercise may increase albumin levels in the urine. As such, the

results must be confirmed through additional testing. Based on the results from the microalbuminuria test, your doctor will be able to determine the extent of the kidney damage that has occurred. The results will also enable your doctor to provide appropriate treatment for kidney damage and its underlying cause(Darla Burke,2012)

Chapter three

3.Material and methods

3.1 Study design:

This is a cross-sectional study.

3.2 Study area:

This study was carried out at the Sudanese renal transplanted association,bahari state.

3.3 Study subjects and period

Patients with renal transplanted attended the hospital during 2015 were investigated in this study.

3.4 Inclusion criteria:

Renal transplanted patient with No other disease was included in this study.

3..5 exclusion criteria:

Patient with, diabetic,and coronary heart disease, family lipidemia ,hypertention and cancer was excluded from the study.

3.6 Sample size:

100 patient with renal transplanted ,chosen 50 with normal value as control and 50 as patient.

3.6 Data collection:

Data was collected by interview structured questionnaire, clinical records.

3.8Sample collection:

after informed consent and use local antiseptic for skin (70%)ethanol ,3ml of venous blood was collected from each volunteer in this study using disposable plastic syringe .the venous blood poured in li heperin container .and directly examed ,from the same patient collect sample of urine and tested by urine strip to detect macroalbuminuria and left to stand at 4C .

3.9Ethical consideration:

A consent was taken regarding acceptance to participate in the study and reassurance of confidentiality .before the specimen was collect ,the donerkew that this specimen was collected for research purpose.

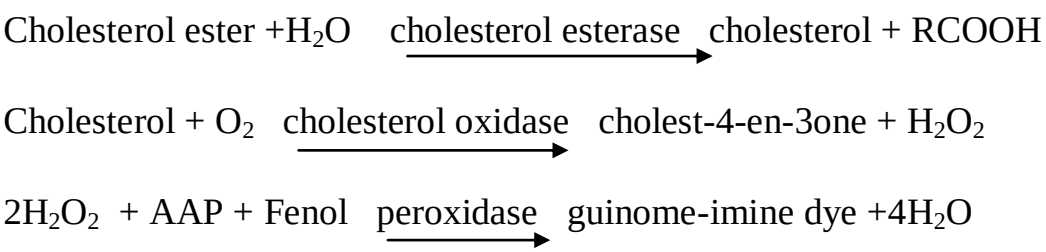
3.10 methodology:

1-Estimation of lipid profile:

Serum total cholesterol, low density lipoprotein cholesterol (LDL cholesterol), high density lipoprotein cholesterol (HDL cholesterol), and triglycerides (TG) were determined enzymaticallyaccording to the reagent manufacturer's instruction.

a-Cholesterol estimation:

-Test principle



b-Triglyceride estimation:

-test principle:

triglyceride + 3 H_2O $\xrightarrow{\text{lipoprotein lipase}}$ glycerol + RCOOH

glycerol + ATP $\xrightarrow{\text{glycerokinase}}$ glycrol 3 phosphate + ADP

mg^+

glycerol 3 phosphate + O_2 $\xrightarrow{\text{glyceroperoxidase}}$ dihydroxyacetone phosphate +H_2O_2

.H_2O_2 + 4aminophenazone + 4chlerophenol $\xrightarrow{\text{peroxidase}}$ 4-p(p-benazoguinone-monoimine)+phenazone + 2 H_2O+HCL

c-High density lipoprotein (LDL) estimation:

-Test principle:

LDL-cholesterol esters +H_2O $\xrightarrow{\text{detergent}}$ cholesterol +free fatty

$\xrightarrow{\text{Cholesterol esterase}}$

LDL-cholesterol + O_2 $\xrightarrow{\text{cholesterol oxidase}}$ 4cholestenone +H_2O_2

H_2O_2 + 4-aminoantipyrine+$HSDA^a$ +H_2O + H^+ $\xrightarrow{\text{peroxidase}}$ purple – blue pigment +5H_2O

d-Estimation of HDL :

Test principle:

HDL cholesterol esrers + H_2O $\xrightarrow{\text{cholesterol esterase}}$ HDL –cholesterol + RCOOH

HDL cholesterol + O_2 $\xrightarrow{\text{cholesterol oxidase}}$ 4cholestenone +H_2O_2

H_2O_2 + 4-aminoantipyrine+$HSDA^a$ +H_2O + H^+ $\xrightarrow{\text{peroxidase}}$ purple – blue pigment +5H_2O

2-Estimation of microalbuminuria :

By albumin creatinine ratio.

a-Estimation of urine albumin:

byimmunoturbidimetric method

- test principle:

Ani-albumin antibodies react with the antigen in sample to form antigen /antibody complexes which,followingagglutnination ,are measured turbidmetrically.

b-Estimation of urine creatinine:

The method is based on the reaction of creatinine with sodium picrate (jaffereaction)

-Principle:

Creatinine reacts with picrate forming ared complex .the intensity of color formed is proportional to the creatinine concentretion in the sample

c-Caluculation of albumin creatinine ratio:

albumin (μg)/creatinine (mg),

-range (30-300ug/mg)

3.11Quality control :

The precision and accuracy of all methods used in this study were checked and was analyzed

3.12 statistical analysis:

Data was analyed by using the spss computer program .independent T test was applied to compare the mean and SD of lipid profile and

microalbuminuria between patient and patient control group (P-vale <0.05 is considered significant) and correlatin was used to compare lipid profile ,microalbuminuria and duration of renal transplant .

4 Result

The study was done during the period May to July .total of 50 Sudanese kidney transplanted patients admitted to Sudanese renal transplanted association ,and 50 kidney transplanted patients matched for age and sex were selected as control group.

Table(4.1):

-Show a significant increase between means of ACR in patient control compare to patient

(mean±SD):(mean 22.5161±13.5322 versus207.552±55.534)

- Show a significant decrease between means of HDL in patient compare to patient control

(mean±SD):(mean 46.1521±15.6306 versus40.432±11.8352)

- Show insignificant difference between means of LDL in patient control to patient (mean±SD):(mean84.292±26.0489 versus95.740±35.1562)

- Show insignificant difference between means of TG in patient control compare to patient (mean±SD): (mean108.3761±56,0817 versus126.4567±73.1171)

- -Show insignificant difference between means of CH in patient control compare to patient (mean±SD): (mean158.944±36.1223 versus163.5085±50.7440)

Figure(4.1);

A scatter plot Show insignificant week positive correlation between ACR and duration in sudanse renal transplantation (r=.08 ,p value=.5).

Figure(4.2):

A scatter plot Show insignificant week negative correlation between HDL and duration in sudanse renal transplantation (r=-.2 ,p value=.1)

Figure(4.3):

A scatter plot Show insignificant week positive correlation between LDL and duration in sudanse renal transplantation(r=.01 ,p value=.9)

Figure(4.4);

A scatter plot Show insignificant week positive correlation between TG and duration in Sudanse renal transplantation (r=.09p value=.5).

Figure(4.5):

A scatter plot Show insignificant week positive correlation between CHOL and duration in sudanse renal transplantation (r=.08 ,p value=.5).

Table (4,1):comparison between mean of microalbuminuria and lipid profile in study group:

Parameters	Patients Control Mean+SD	Patients Mean+SD	P vale
ACR	22.516±13.5322	207.55±55.534	.000
HDL	46.152±15.6306	40.432±11.8352	.04
LDL	84.292±26.0489	95.740±35.1562	.06
TG	108.376±56.8017	126.456±73.1171	.1
CH	158.94±436.1223	163.508±50.7440	.6

The table shows mean±SD ,and the probability (P)

T-test was used for comparision.

P-value <0.05 is consider significant .

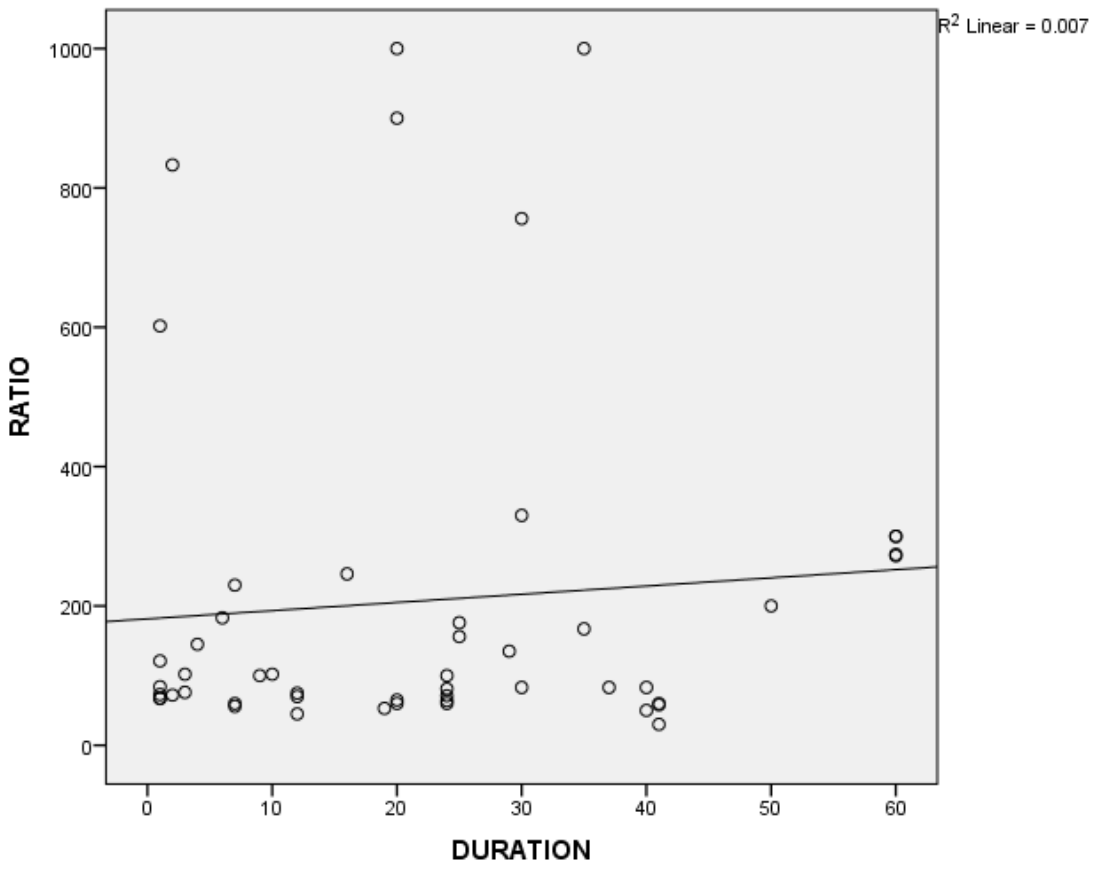


figure (4.1): Ascatter plot Show correlation between ACR and duration in sudanse renal transplantation (r=.08 ,p value=.5). .

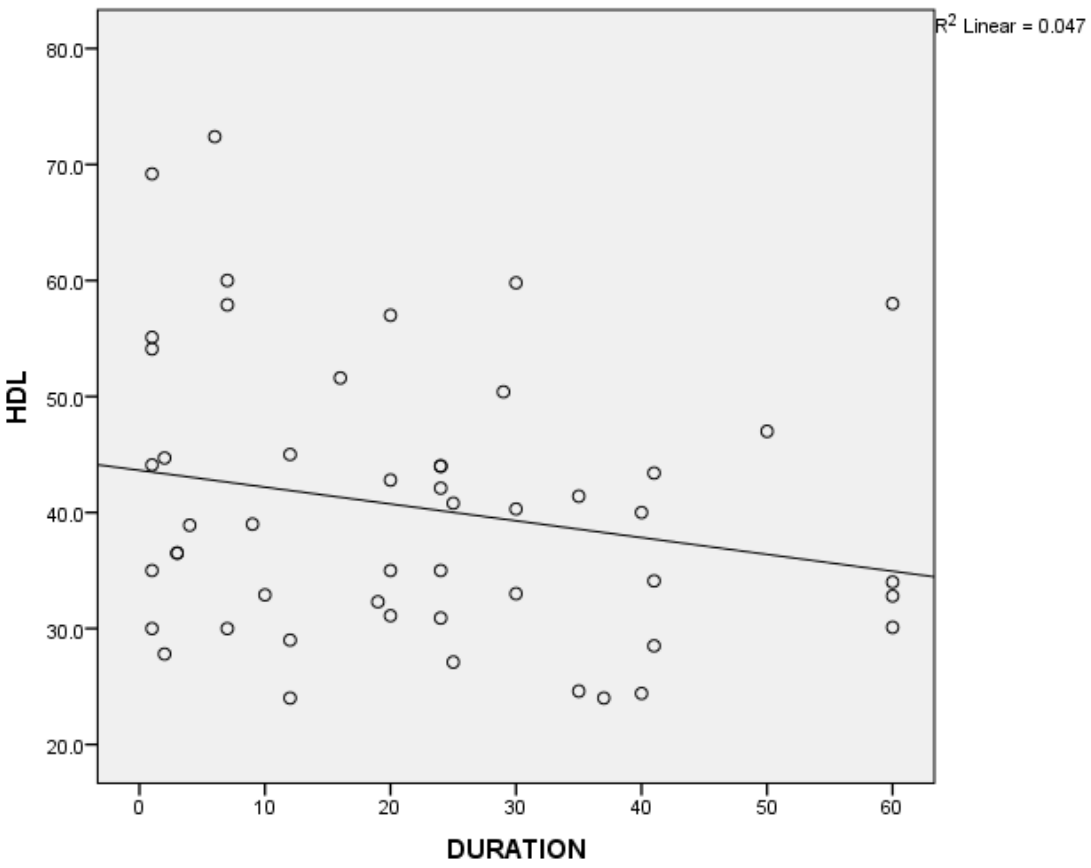


figure (4.2):scatter plot Show correlation between HDL and duration in sudanse renal transplantation (r=-.2 ,p value=.1)

.

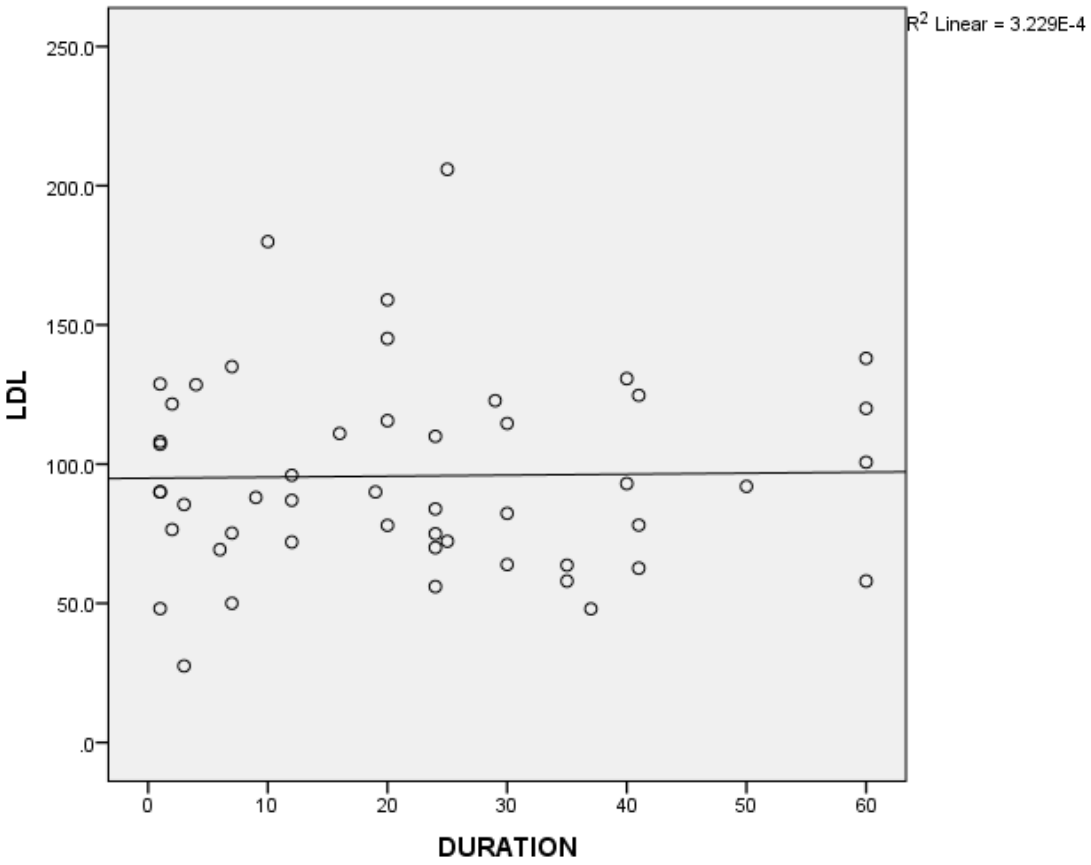
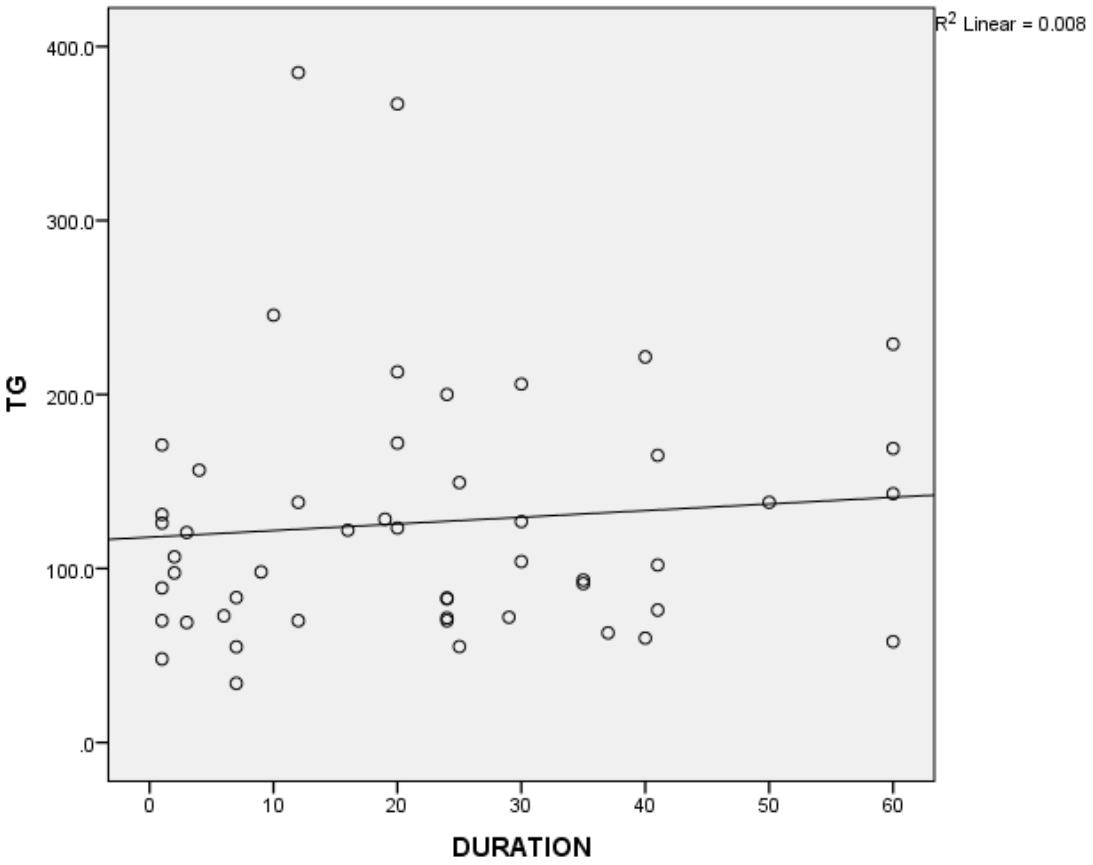


figure (4.3): Ascatter plot Show correlation between LDL and duration in sudanse renal transplantation (r=.01 ,p value=.9)

.



(**figure** (**4.4**)**:**Ascatter plot Show correlation between TG and duration in Sudanse renal transplantation (r=.09p value=.5).

.

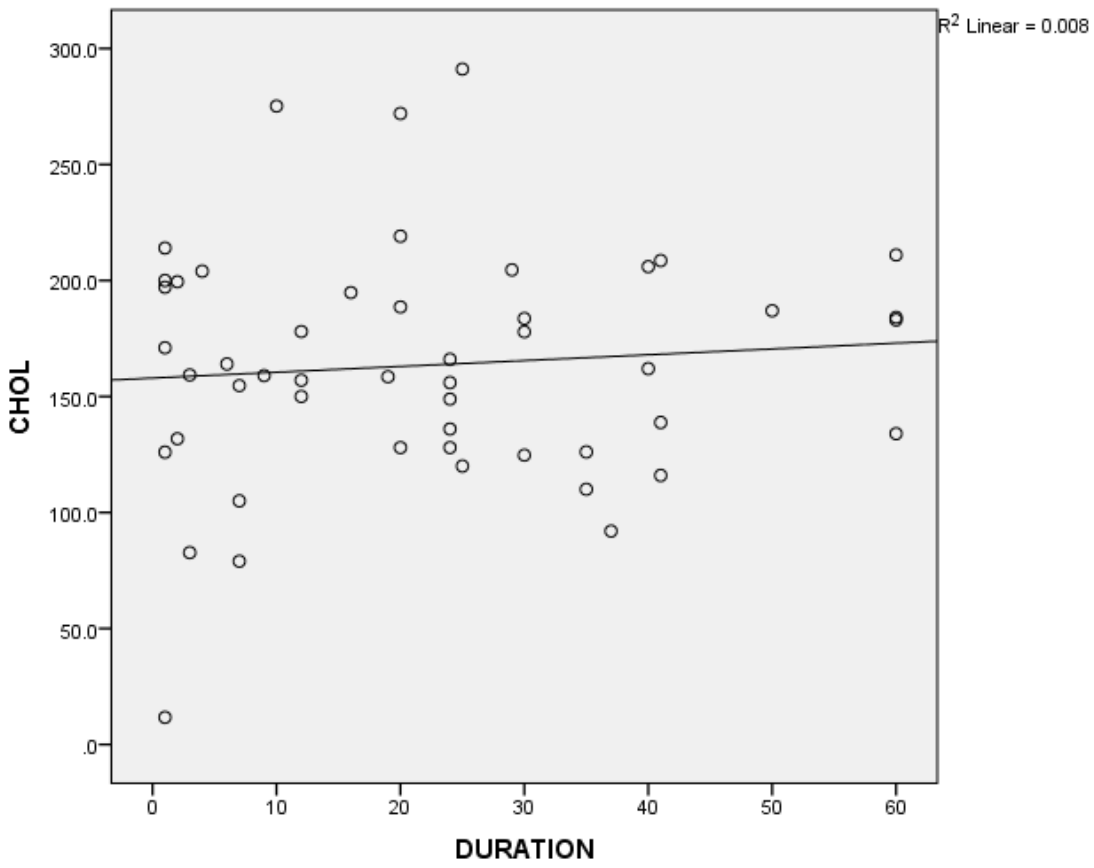


figure (4.5):

Ascatter plot Show correlation between CHOL and duration in sudanse renal transplantation (r=.08 ,p value=.5) .

5 Discussion ,Conclusion and Recommendations

5.1Discussion:

Kidney transplantation is treatment of choice for a minarity of patients with end –stage renal disease (bradly H collins,2015)

Heart disease ,common to hyperlipidemic patients 10-40%deaths after renal transplantation(markell et al,2008).

andMicroalbuminuria predicts graft loss and all-cause mortality in renal transplant recipients(.Prasad GV[1], Bandukwala F, Huang M et al 2009).

In this study, the restricted focus to estimate the lipid profile and microalbuminuria among renal transplanted patients who adimitted to Sudanese renal transplanted association from May to July 2015

In this study the level of HDL was found to be significant decrease in patient compare to patients control and this agree with with (Pannu HS[1], Singh D, Sandhu JS.2003) which finding conformed that Patients who undergo renal transplantation often have end stage renal disease (ESRD) for years and many of them already have lipid derangement before transplantation

after successful renal transplant, though the renal function returns to normal, the lipid profile is reported to remain abnormal(. Chan MK,et al 1988),

Also the level of ACR was found to be significant increased in patient compare to patient control and this agree with (Prasad GV[1], Bandukwala F et al 2009).

ACR use as marker of vascular endothelial dysfunction and an important prognostic marker for kidney disease.(Mahmoodi, BK; Gansevoort, RT,et al,2009)

In this study the level of LDL,TG and CH were Insignificant increase when compare to patient control.

According to duration of renal transplantation this study found insignificant difference correlation in TG ,TC,LDL, HDL and ACR.

The pathogenesis of changes in lipid pattern in transplant patients is not clearly understood though it appears to be multifactorial (BegadeJD,et al 1976) .

In other study found renal allograft recipients showed significantly high levels of TG , Tch , LDL and ch ($p< 0.01$)compared with normal subjects. (Suleiman et al ,2009).

5.2 Conclusion:

From this study ,it concluded that:

1-the level of microalbuminuria(ACR)are significant increased in renal transplant patient.and significant decreased in HDL.

2-the level of TG,LDLand CH are insignificant in renal transplanted patient .

3-there are insignificant correlation between TG,ACR,HDL,LDL,and CH and duration of renal transplantation.

5.3 Recommondation:

1-Estimation of lipid profile and microalbuminuria should be used as routine test for renal transplanted patients.

2-Use of large sample from different hospitals will reflect real picture for renal transplanted sudanese patients.

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Questionnaire for lipid profile and microalbuminuria

Date:……

Medical Record #	Code Number:

Name:	Telephone #

Patient's characteristics:

1. Age:……
2. Duration of disease:……
3. Other disease:……

Laboratory Investigation:

Lipid profile and microalbuminuria (ACR) TG Cholesterol HDL LDL Urine albumin Urine creatinine	mg/dl