



RESEARCH ARTICLE

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RISK OF CORONARY HEART DISEASES IN CHRONIC RENAL FAILURE PATIENTS IN AL-LEITH HOSPITAL

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ARTICLE INFO

Article History:

Received 03rd October, 2019
Received in revised form
17th November, 2019
Accepted 21st December, 2019
Published online 29th January, 2020

Key Words:

Coronary Heart Diseases,
Renal Failure.

ABSTRACT

This study was conducted with the main objectives of determination the risk of Coronary Heart diseases in patients with chronic renal failure (CRF) in 25 Saudi males and females patients on hemodialysis. The data was collected from the unit of hemodialysis in Al - leith hospital. So 25 patients with kidney failure were tested, Following the distribution of the questionnaire, the following results were obtained: - The proportion of women is greater than men with renal failure (women 64% and men 30%) -The number of patients who have been diagnosed with heart disease after 4% renal failure. - The number of patients who have had hypertension after 56% renal failure. In this study 8% (2/25) of patients with total cholesterol were reported, this is a significant increase in level. Hypercholesterolemia has been confirmed as an independent risk factor for cardiovascular disease. - Also in this study 28% (7/25) of patients with high triglycerides were reported, this is a significant level increase. High triglyceride is not confirmed whether it is really an independent risk factor for cardiovascular disease.

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Citation: Huda A. Eltahir¹, Wafa S. Alomari, Roqaya A. Alamoudi, Azizah S. Almalki¹, Dalal A. Albrakati¹, Eidah M. AlMehdini and Sharefa S. Alzhrani, 2020. "Risk of coronary heart diseases in chronic renal failure patients in Al-Leith hospital", *International Journal of Development Research*, 10, (01), 33016-33019.

INTRODUCTION

There are two kidneys, each about the size of a fist, located on either side of the spine at the lowest level of the rib cage. Each kidney contains up to a million functioning units called nephrons. A nephron consists of a filtering unit of tiny blood vessels called a glomerulus attached to a tubule. When blood enters the glomerulus, it is filtered and the remaining fluid then passes along the tubule. In the tubule, chemicals and water are either added to or removed from this filtered fluid according to the body's needs, the final product being the urine we excrete. The kidneys perform their life-sustaining job of filtering and returning to the bloodstream about 200 quarts of fluid every 24 hours. About two quarts are removed from the body in the form of urine, and about 198 quarts are recovered. The urine we excrete has been stored in the bladder for anywhere from 1 to 8 hours. The critical regulation of the body's salt, potassium and acid content is performed by the kidneys. The kidneys also produce hormones that affect the function of other organs.

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The kidneys are powerful chemical factories that perform the following functions [Chertow, 2004].

- Remove waste products from the body.
- Remove drugs from the body.
- Balance the body's fluids.
- Release hormones that regulate blood pressure.
- Produce an active form of vitamin D that promotes strong, healthy bones.
- Control the production of red blood cells.

Renal failure: is due to the build-up of waste products and excess fluid in the body.^[2]and when the kidneys lose the ability to filter waste from blood sufficiently [Nelson, 2013].

Acute renal failure: A sudden worsening in how well the kidneys work. Dehydration, a blockage in the urinary tract, or kidney damage can cause acute renal failure, which may be reversible (Hogan, 2014). Acute kidney failure can occur when: they have a condition that slows blood flow to the kidneys, they experience direct damage to your kidneys, the kidneys' urine drainage tubes (ureters) become blocked and wastes can't leave the body through your urine (Crowley).

Chronic renal failure: is the gradual loss of the kidney functions; it is triggered when the kidney experiences severe harm. Thus, it loses the ability to filter the blood from poisons and let the waste matter out properly. This leads to having the poisons gathered in the body; consequently, complications take place affecting the health of humans. Kidney is made up of nephrons, and nephron is defined as the structural and functional unit of the kidney. Accordingly, the chronic kidney disease attack these units impacting them gradually over the course of months or years .attack these units impacting them gradually over the course of months or years (Per-OlaAttman, 1999).

Causes of the Chronic Kidney Disease: Diabetes, High blood pressure, chronic kidney inflammation, kidney artery blockage, use of some medicines having long-term effect on the kidney, birth defects in the kidney, kidney stones [Bradley, 2000].

MATERIAL AND METHODS

Subjects included in this study were 25 patients attending the unit of hemodialysis in Al-leith hospital. The 25 patients males and females with chronic renal failure with age between 20 – 66 years and more, and they have had regular hemodialysis (three time per week) divided into two groups per day, morning and evening periods.

Data collection: Ethical considerations: before conduction of the study, all necessary approvals were obtained. All 25 patients accepted to participate in the research, and we filled the questionnaire (attached) with the patients' data, and we collected data (Blood pressure BP, Blood sugar BS, cholesterol , Triglycerides, Low density cholesterol LDL, High density HDL) from the patients' files with assistance of the nurse in unit.

RESULTS

Twenty five Saudi patients of chronic renal failure from Al-leith unit of dialysis had been subjects of this study. They were classified according to their age into three groups and also according to the sex. The distribution of sex groups were shown in table (1). The distribution of age groups were shown in table (2). Table (3) shows the normal and abnormal values of total LDL cholesterol, HDL cholesterol, cholesterol and triglycerides.

Table 1. Distribution of sex gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid male	9	36.0	36.0	36.0
female	16	64.0	64.0	100.0
Total	25	100.0	100.0	

Table 2. Age Groups Distribution

Age	Number	The ratio
20-45	8	32.00%
46-65	12	48.00%
66 and more	5	20.00%

Serum lipid: Serum total cholesterol, HDL-cholesterol, LDL-cholesterol and triglycerides were shown in Table (4) Figure

(3), Table (5) Figure (4), Table (6), Figure (5) And Table (7), Figure (6) respectively.

Table 3. Normal and abnormal blood concentration of lipid profile

Healthy Cholesterol Range				
	Unit	Optimal	Intermediate	High
Total Cholesterol	mg/dL	<200	200 - 239	>239
	mmol/L	<5.2	5.3 - 6.2	>6.2
LDL Cholesterol (calculated)	mg/dL	<130	130 - 159	>159
	mmol/L	<3.36	3.36 - 4.11	>4.11
HDL Cholesterol	mg/dL	>60	40 - 60	<40
	mmol/L	>1.55	1.03 - 1.55	<1.03
Triglycerides	mg/dL	<150	150 - 199	>199
	mmol/L	<1.69	1.69 - 2.25	>2.25
Non-HDL-C (calculated)	mg/dL	<130	130 - 159	>159
	mmol/L	<3.3	3.4 - 4.1	>4.1
TG to HDL ratio (calculated)	mg/dL	<3	3.1 - 3.8	>3.8
	mmol/L	<1.33	1.34 - 1.68	>1.68

Table 4. Serum Cholesterol Concentrations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal	23	92.0	92.0	92.0
	high	2	8.0	8.0	100.0
	Total	25	100.0	100.0	

Table 5. Serum HDL- cholesterol Concentrations

		Frequency	Percent
Valid	optimal	11	44.0
	Low	14	56.0
	Total	25	100.0

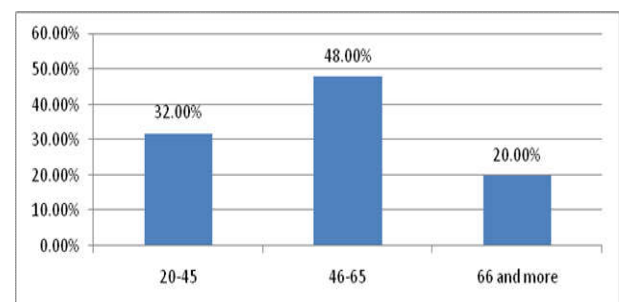


Figure 1. Distribution of sex gender

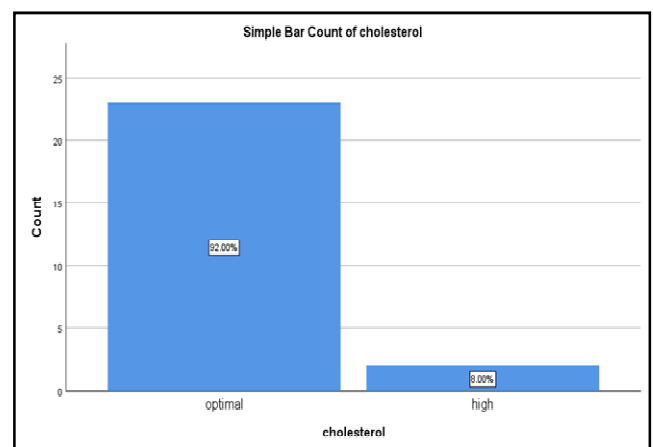


Figure 2. Distribution of cholesterol concentration

Blood sugar: The concentrations of fasting blood sugar, which done as a routine analysis for CRF patients were shown in Table (8) and Figure (7).

Table 6. Serum LDL- cholesterol concentrations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal	22	88.0	88.0	88.0
	high	3	12.0	12.0	100.0
	Total	25	100.0	100.0	

Table 7. Serum Triglycerides concentrations

		Triglycerides			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	optimal	18	72.0	72.0	72.0
	high	7	28.0	28.0	100.0
	Total	25	100.0	100.0	

Table 8. Concentration of fasting blood sugar

		BLOOD SUGAR			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	normal	18	72.0	72.0	72.0
	up normal	7	28.0	28.0	100.0
	Total	25	100.0	100.0	

Table 9.

		blood pressure			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	17	68.0	68.0	68.0
	Up Normal	8	32.0	32.0	100.0
	Total	25	100.0	100.0	

Blood pressure: Also blood pressure results for CRF patients were shown in Table (9) and Figure (8).

DISCUSSION

The increased incidence of premature atherosclerosis in patients of (CRF) may in part be related to abnormalities in lipid metabolism.

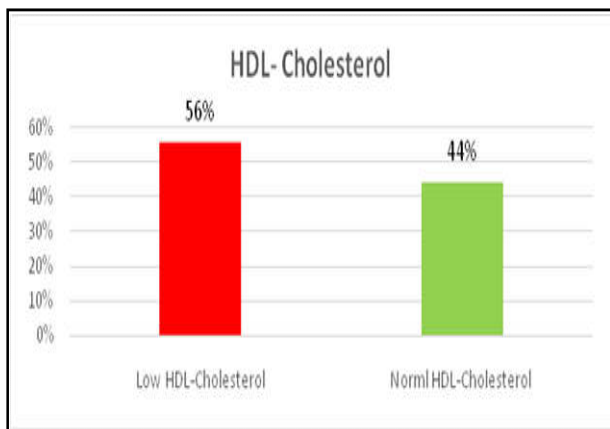


Fig. 3. Distribution of HDL- cholesterol concentrations

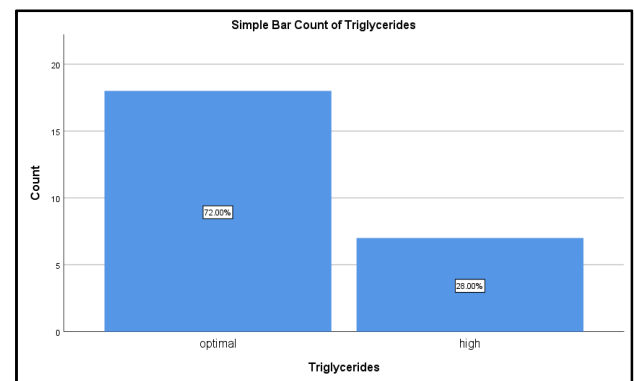


Figure 5. Distribution of Triglycerides concentrations

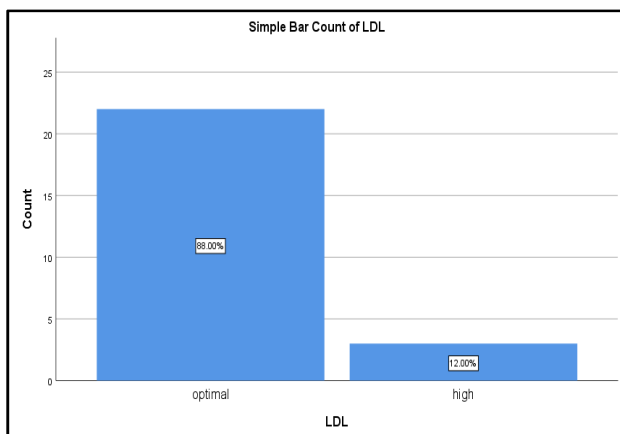


Figure 4. Distribution of LDL- cholesterol concentrations

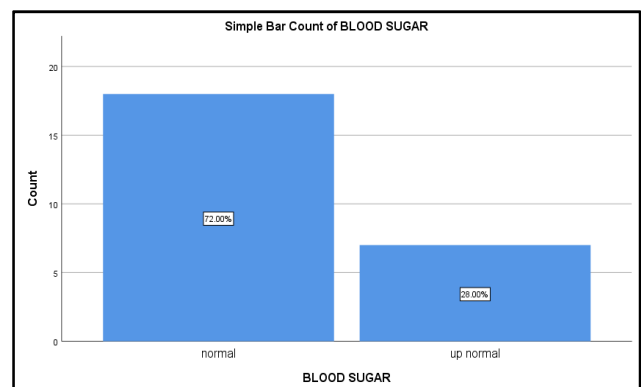


Figure 6. Distribution of Fasting blood sugar concentrations

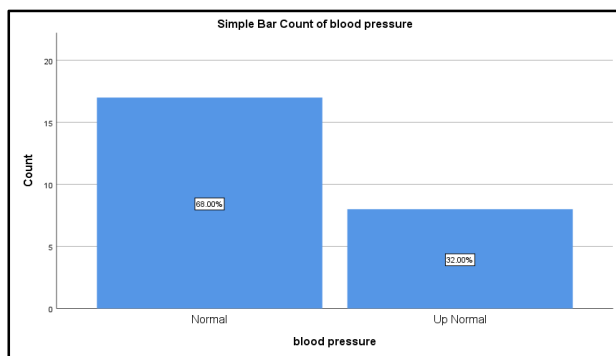


Figure 7. Blood pressure distribution

Lipoproteins disturbance in patients with (CRF) receiving hemodialysis consist of abnormalities in the concentration of serum very low density lipoproteins (VLDL) lipoprotein remnant particles and triacylglycerols, enriched low density lipoprotein (LDL) are frequently observed in these particles and appear to be independent of the length of hemodialysis. On the other hand, it is well known that the elevation of serum triacylglycerols and cholesterol as well as abnormal lipoproteins are recognized as cardiovascular risk factors in the general population and probably play an important role in the development of accelerated atherosclerosis in patients with (CRF). The Major causes of death among patients with (CRF) is atherosclerotic cardiovascular disease in which numerous predisposing factors mainly hypertensive and lipid abnormalities are observed. There is a well known epidemiological association between coronary heart disease and increased levels of LDL-cholesterol and / or decreased levels of HDL - cholesterol. The heterogeneity of lipoproteins observed in patients with (CRF) had been described to disturbances in the key enzymes, mainly lipoprotein lipase and hepatic lipase expression.

Total cholesterol: In this study 8% (2/25) of the patients were reported with high total cholesterol, and this is increased level is significant. Hyper-cholesterolemia was confirmed as an independent risk factor for cardiovascular disease.

Triacylglycerol's: In this study 28% (7/25) of the patients were reported with high triacylglycerols, and this is increased level is significant.. Hyper-triacylglyceridemia was not confirmed whether is truly an independent risk factor for cardiovascular disease. (Brunzell JD 2000)

LDL-Cholesterol: In this study 12% (3/25) of patients showed an increased value of LDL-cholesterol. The atherosclerosis incidence in (CRF) patients due to high concentration of LDL-cholesterol was explained by (Minoru Ando et al 1996).

HDL-Cholesterol: Also 56% (14/25) of the patients shown low concentration (less than 40 mg / dl) of HDL - cholesterol. HDL - cholesterol is also related to the triacylglycerols transport in plasma, and is indicator for a state of lipid transport that protect against atherosclerosis .kidney might result in HDL particles with abnormal chemical composition and molecular sizes. These structural abnormalities might account for the decreased rate of cholesterol transfer from HDL to VLDL and LDL as well as the impaired tissue cholesterol removal by HDL.

Conclusion

From this study there is significant hyperlipidemia (P -value=0.00).among patients with CRF. This indicates that, the study of the risk of atherosclerosis in patients of (CRF) must be of long-term, well-controlled studies which involve all risk factors at the same time with all drugs of patients on use.

REFERENCES

- Ando, I Lundkvist, J Bergström, 1996. B Lindholm - Kidney international - Elsevier
- Babua C., Kalyesubula R., Okello E., Kakande B., Sebatta E., Mungoma M. et al., 2015. Cardiovascular risk factors among patients with chronic kidney disease attending a tertiary hospital in Uganda. *Cardiovascular Journal of Africa*. 26(6):177–80
- Background—Familial combined hyperlipidemia (FCHL) and familial hypertriglyceridemia
- Bradley, CM., McNeely, MJ., Psaty, BM., Brunzell, JD. 2000. Circulation, - Am Heart Association
- Chertow GM., Fan D., McCulloch CE., Hsu CY. 2004. Chronic kidney disease and the risks of death, cardiovascular events, and hospitalization. *N Engl J Med.*, Sep 23; 351(13):1296–305.
- Crowley ST., Chertow GM., Vitale J., O'Connor T., Zhang J., Schein RM., Choudhury D., Finkel K., Vijayan A., Paganini E., Palevsky PM., VA/NIH Acute Renal Failure Trial Network Study Group.
- Enhanced scavenger receptor expression in monocyte-macrophages in dialysis patients
- Hogan J., Mohan P., Appel GB. 2014. Diagnostic tests and treatment options in glomerular disease: update. *Am J Kidney Dis.*, 2014; 63(4), 656–666.
- Nelson RH. 2013. Hyperlipidemia as a risk factor for cardiovascular disease. *Primary Care: Clinics in Office Practice*. 40(1):195–211.
- Per-Ola Attman, Peter Alapovic 1999. department of Nephrology, University of Gotborg, Seweden. Lipoprotein and Atherosclerosis research program
