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EVALUATION PLASMA OSTEOPONTIN LEVELS AND SOME BIOCHEMICAL MARKERS IN PATIENTS WITH CHRONIC KIDNEY DISEASE COMPLICATIONS

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ABSTRACT

A cross-control study was carried out for the estimation of osteopontin levels and some biochemical markers in patients with chronic kidney disease complications. The number of patients under the study were 135 patients with chronic kidney disease and acute kidney disease control group with the same demographic properties. The study showed that the highest mean level of Osteopontin was in patients with chronic renal disease and acute kidney disease, while the averages were a low in the control group. The current study showed that the mean age the mean age of the experimental group is 20 years higher than the average age of the control group for the group II and about 15 years higher for the group II when compared with the control group. While the means value of weight was weak statistically significant when performing the statistical analysis. The average value of GFR was statistically significant when performing the statistical analysis for the experimental group consisting of two groups of patients diagnosed with acute chronic renal failure. Serum OPN concentrations correlated with GFR, blood urea, S. creatinine, TSB, triglyceride, HDL, LDL ($r=-0.9$, $P<0.0001$).).

Keywords: CKD, Osteopontin, Biomarkers, AKIA, GFR

INTRODUCTION

Chronic renal disease can define as a blanket term covering a variety of illnesses that affect the kidney's structure and function. The severity, rate of advancement, and etiology and pathology all play as a role in some disease expression. Since the conceptualization, definition, and staging of this disease ten years or more ago, the guidelines recommend a transition from considering kidney disease to be a life-threatening disorder a small number of people who require nephrologists' care. Early detection and prevention of disease were also stressed, as well as treatment options. Discuss the difficulties encountered in the management of clinical trials, the formulation of guidelines, and public health in the context of chronic renal disease and aging and vascular disease. We concentrate on the most recent data and identify areas of uncertainty as well as potential study directions (Asmar *et al*. 2019)The nephron, it is the kidney function test is essential for people with disease or disorders. At the same time, renal function tests may be used to diagnose renal disease, monitor the kidneys' response to therapy, and forecast the course of renal illness. According to the National Institutes of Health, chronic kidney disease (CKD) affects around 14% of the population. The most frequent causes of chronic kidney disease (CKD) worldwide were hypertension and diabetes (Lee *et al*. 2019).The lymphocytes, macrophages, endothelial cells, cells, and endothelium have all been shown to express osteopontin (OPN) in several tissues, including bone, kidney, and T lymphocytes, macrophages, endothelium cells, smooth muscle cells, and epithelial cells. In autoimmune disorders such as multiple sclerosis (MS), systemic lupus erythematosus (SLE), and rheumatoid arthritis (RA), as well as chronic inflammation-related diseases such as Crohn's disease, OPN plays a critical role, obesity, cardiovascular disease, and kidney damage; and numerous cancer types. Recent research has linked the OPN polymorphism to urolithiasis and primary biliary sclerosis (Kestenbaum and Seliger 2017).The other biochemical markers can be associated with kidney disease are blood urea, serum creatinine, uric acid, albumin, and total protein. Kidney function can be investigated and assessed using a range of clinical laboratory tests. The most practical procedures for assessing renal function in the clinic include estimating the glomerular filtration rate (GFR). The rate at which plasma chemicals are filtered by the glomerulus in milliliters per minute, or the rate at which a substance is eliminated from the blood, is known as GFR. A healthy adult male's GFR is between 90 and 120 mL per minute. The most often used endogenous measure for measuring glomerular function is creatinine.

The creatinine clearance is calculated and used to define GFR. The Modified Diet in Renal Disease (MDRD) and the CKD-EPI both employ GFR estimate techniques such as serum creatinine (Chronic Kidney Disease Epidemiology). Urea levels rise sooner in renal disease, making it a less reliable indicator of renal function than serum creatinine. The presence of excessively high quantities of albumin in the urine is known as albuminuria. Because there is no such biological molecule as micro albumin, it is no longer utilized. Urine albumin is the only word now in use. Albuminuria is used as a diagnostic tool in diabetics to detect nephropathy early. Because it pertains to increased endothelial permeability, it is a symptom of chronic renal impairment as well as an independent risk of cardiovascular disease (Rhee *et al*. 2017).

MATERIAL AND METHODS

The study was carried out on patients collected from Kirkuk General Hospital for Dialysis in Kirkuk Province, Kirkuk city, from May 2021 to August 2021. The practical side of the study was performed at the Kirkuk General Hospital. For the study, Evaluation plasma Osteopontin Levels and some biochemical Markers in the patients who have chronic kidney disease complications. We depended on the samples taken from CKD patients, AKD and other samples from healthy people as the control group

Also This study was included 135 sample the age of them between (15-75) years old, were divided into three groups:

1. Control group: which included 45 apparently healthy.
2. Group A: 45 patients with chronic kidney disease.
3. Group B: 45 patient with acute kidney disease

Tools and materials used in the study

	Materials	Origin
1	Cotton	China
2	Eppendorf	Denmark
3	Gloves	China
4	Syringe	China
5	Jell tube	China
6	Tips (blue 1mL,yellow 100M)	China
7	Disposable test tube	Afco-despo/ Jordan

Chemical used in the study chemical used in the study

	Kits	Type	Company, Origin
1	Osteopontin by ELISA	ELISA	Elabscience / China
2	Blood urea	Spectrophotometer	BIOLABO / France
3	Creatinine	Spectrophotometer	BIOLABO / France
4	TSB	Spectrophotometer	BIOLABO / France
5	Uric acid	Spectrophotometer	BIOLABO / France
6	Total cholesterol	Spectrophotometer	BIOLABO / France
7	HDL	Spectrophotometer	BIOLABO / France
8	TG	Spectrophotometer	BIOLABO / France

Instruments used in the study

	Materials	Company and origin
1	Centrifuge	Suzhou Dukangning Medical. China
2	ELISA washer and reader	China (Mindray)
3	Freezer	Liebhe (Austria)
4	Incubator	Germany (Memmert)
5	Micropipettes (100-1000) μL, Micropipettes (5-50) μL	XINKANG / China
6	Spectrophotometer	Japan (APEL)
7	Water bath	Germany (Memmert)

Methods:

Sampling:

Using disposable syringes, a vein puncture was used to extract around 5 mL of blood. Put in a plane tube and leave for 10–15 minutes at room temperature to clot, then centrifuge for 15 minutes at 2000 g. and serum were separated at this time and split into eight parts in labeled Eppindorf tubes with a serial number and the names of the patients, then frozen at –20 °C until use

RESULTS AND DISCUSSION

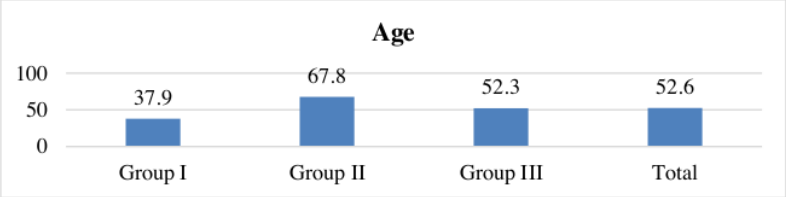
In the trials within the scope of our study, 135 patients and healthy person were evaluated with taking into account age, Group I which is (Control Group), Group II (Chronic Kidney Disease), Group III (Acute Kidney Disease), gender and presence of additional disease. The levels were studied Human Osteopontin, Blood urea, S. creatinine, TSB, Uric acid, total cholesterol levels, HDL, LDL, VLDL and TG in blood serum samples for all cases.

1.1 Age

Considering the average age, the mean age of the experimental group is twenty years (67.8 ± 11.4) higher than the average age of the control group for the group II and about 15 years (52.3 ± 13.4) higher for the group II when compared with the control group (37.9 ± 8.07), as a shown in the Table 4.1 and Figure 4.1. (Chang *et al*. 2018).

Clinical characteristics (age) of control and patients

Groups	No	Mean ±SD	95% Confidence Interval for Mean		Minimum	Maximum	Sig.
			Lower Bound	Upper Bound			
Group I	45	37.9 ± 8,07	35.5	40.3	23.00	58.00	0.001
Group II	45	67.8 ± 11,4	63.6	70.4	36.00	88.00	0.001
Group III	45	52.3 ± 13,4	48.2	56.3	27.00	87.00	0.001
Total	135	52.6 ± 16,2	49.6	55.2	23.00	88.00	0.001

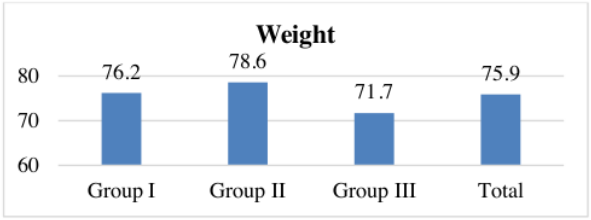


1.2 Weight

While the means value of weight was weak statistically significant when performing the statistical analysis for the experimental group consisting of two groups of patients diagnosed with acute chronic renal failure (78.6 ± 11.8; 71.7 ± 10.5 respectively), the value of the control group was found (67.2 ± 8.41), as a shown in the Table 4.2 and Figure 4.2. Where was lower bound and upper bound at 95% Confidence Interval for The averages for study groups I, II, and III were (64.6; 69.7), (75.1; 82.2), respectively (68.5; 74.8). Obesity (BMI 27 kg/m^2) and overweight (BMI 24 kg/m^2) are the most common. The figures are 45 percent and 39.38 percent, respectively, among patients aged 45–64 years old. We have discovered via research that there is a lot in men's BMI (62.7 percent for overweight; and 56.43 percent for the obesity) (Chang *et al*. 2018).

Clinical characteristics (weight) of control and patients

Groups	No	Mean ±SD	95% Confidence Interval for Mean		Minimum	Maximum	Sig.
			Lower Bound	Upper Bound			
Group I	45	67.2 ± 8.41	64.6	69.7	44.00	94.00	0.063
Group II	45	78.6 ± 11.8	75.1	82.2	45.00	97.00	0.063
Group III	45	71.7 ± 10.5	68.5	74.8	54.00	95.00	0.063
Total	135	75.9 ± 11.7	73.9	78.1	45.00	97.00	0.063

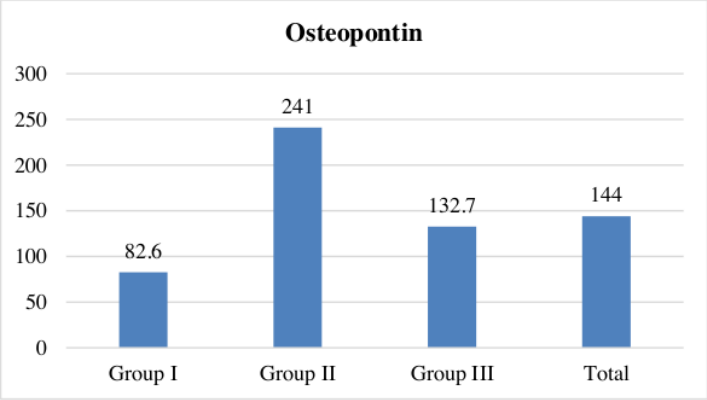


1.3 Osteopontin

Considering the osteopontin hormones was higher statistically significant when performing the statistical analysis for the experimental group and controls group. The mean values were in the experimental group (86.2 ± 12.6; 132.7 ± 15.6) respectively, while the averages were (86.2 ± 12.6) in the control group, as a shown in the Table 4.3 and Figure 4.3. Where was Lower Bound and Upper Bound at 95% Confidence Interval for Mean for study groups, group I, group II and group III respectively (82.4; 89.9), (200.2; 227.7), (127.9; 137.4). In individuals with CKD, GFR and circulating OPN have a strong inverse relationship. Furthermore, in patients with CKD, and OPN; plasma levels correspond with recognized cardiovascular risk factors. In individuals with CKD, determining renal function is critical for interpreting OPN values (Lorenzen *et al*. 2010). There was a step with step increase in circulating OPN as renal function declined, and variations in OPN levels in individuals with CKD at various stages of renal failure were highly significant (P = 0.0007). As a result, OPN plasma concentrations were adversely linked with GFR (r=−0.9, P<0.0001) (Lorenzen *et al*. 2010).

Level of osteopontin in control and patients

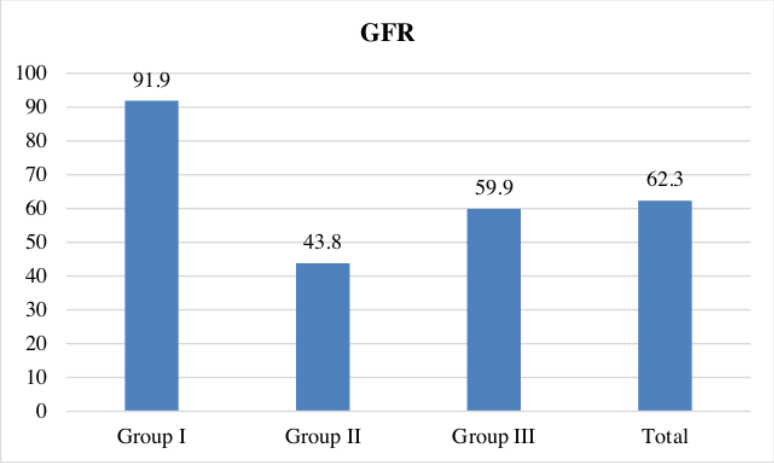
Groups	**No**	**Mean ±SD**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**	**Sig.**
			Lower Bound	**Upper Bound**			
Group I	45	86.2 ± 12.6	82.4	89.9	58.00	111.00	0.0152
Group II	45	241.0 ± 35.7	200.2	227.7	106.00	298.00	0.0152
Group III	45	132.7± 15.6	127.9	137.4	107.00	173.00	0.0152
Total	135	144.0 ± 31.6	134.1	154.5	58.00	298.00	0.0152



1.4 GFR

While the average value of GFR was statistically significant when performing the statistical analysis for the experimental group consisting of two groups of patients diagnosed with acute chronic renal failure (43.8 ± 10.2; 59.9 ± 11.4 respectively), the value of the control group was found (91.9 ± 7.33), as a shown in the Table 4.4 and Figure 4.4. Where was lower bound and upper bound at 95% confidence interval for mean for study groups, group I, group II and group III respectively (89.7; 94.1), (31.7; 37.8), (56.4; 63.3) (Chang *et al*. 2018).

Groups	No	Mean ±SD	95% Confidence Interval for Mean		Minimum	Maximum	Sig.
			Lower Bound	Upper Bound			
Group I	45	91.9 ± 7.33	89.7	94.1	79.00	117.00	0.030
Group II	45	43.8 ± 10.2	31.7	37.8	19.00	64.00	0.030
Group III	45	59.9 ± 11.4	56.4	63.3	44.00	83.00	0.030
Total	135	62.3 ± 12.4	57.9	66.5	19.00	117.00	0.030



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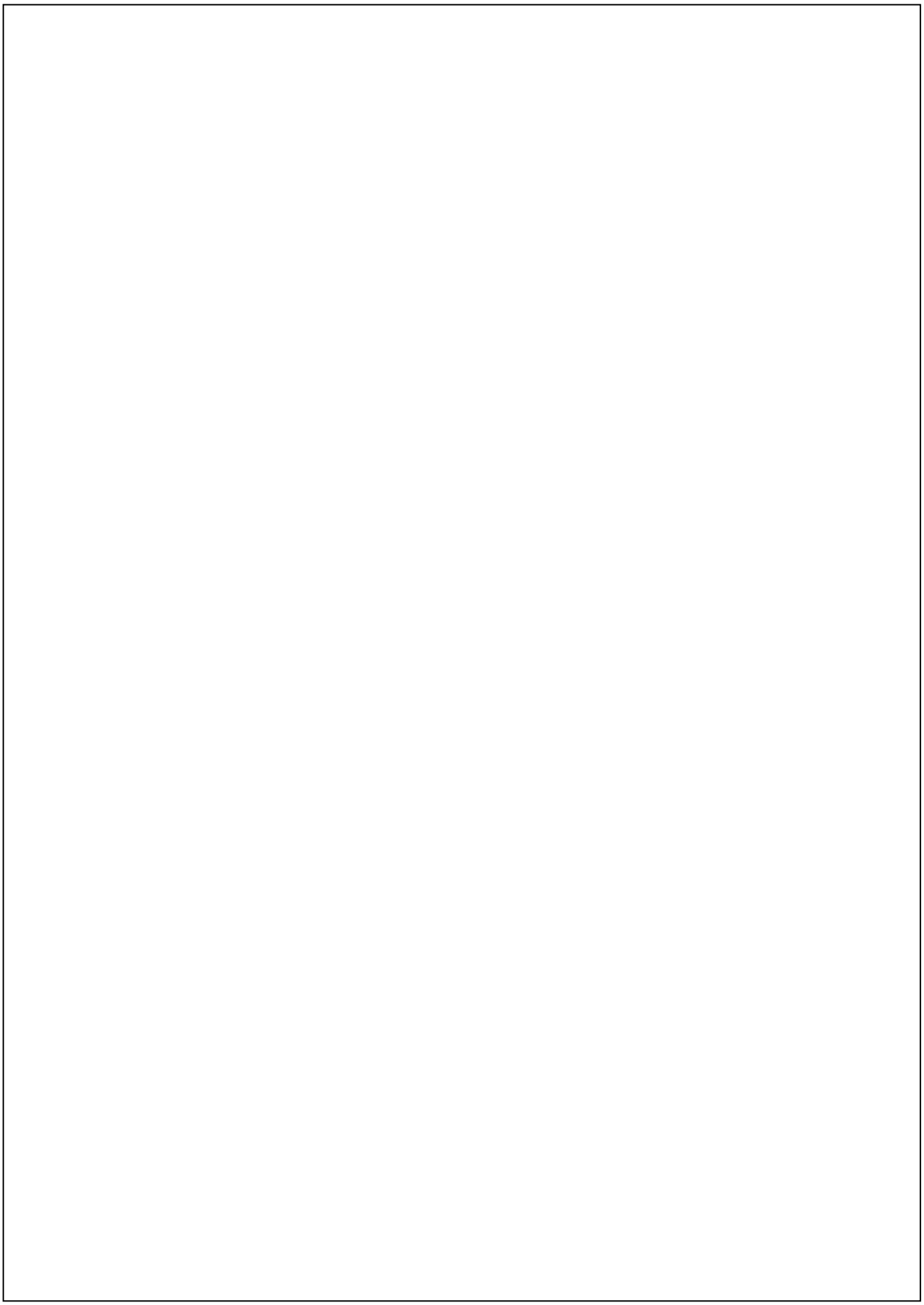

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