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# SEROPREVALENCE OF ANTI-CARDIOLIPIN ANTIBODIES IN SUDANESE PATIENTS WITH RENAL FAILURE IN KHARTOUM STATE, SUDAN

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## ABSTRACT

**Background:** Antiphospholipid antibodies are a heterogeneous circulating immunoglobulins family of approximately twenty auto antibodies directed against phospholipids binding plasma proteins. Anticardiolipin (ACL) is the most commonly investigated APL in relation with several diseases as Rheumatoid arthritis, systemic thrombosis, cerebral ischemia, deep vein thrombosis and renal failure . Anti-cardiolipin antibodies can be classified in two ways; As IgM, IgG or IgA and as ß2-glycoprotein dependent or independent. Renal failure (RF) 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 extracellular fluids. **Objective:** This study aimed to investigate the Seroprevlance of ACL among renal failure patients. **Materials and Methods:** this is a case-control study conducted in an Integrated Mdedical Lab and Al-Ryadah Medical Laboratories in Khartoum, Sudan from March to May 2017. It included one hundred samples; 50 cases and 50 controls, IgG and IgM anti-cardiolipin were investigated using ELISA. WBCs, PLT, Hb, HCT and RBCs were determined by automated cell analyzer. **Results** TWBCs were significantly higher in renal failure patients than control (P=0.000). Platelets didn't show significant difference between case and control(P=0.754). IgAGM anticardiolipin antibodies positive results were found in 14 (14.1%) in 100 participants.Positive results were 85 (85.9%), out of 14 (14.1) positive results 10 (71.4) were positive in the case groups while 4 (28.6%) were positive in control group, negative result was 40 (47.1%) in case and 45 (52.9%) in control group. There is no significant different between case and control with P.Value 0.080. **Conclusion:** IgAGM anticardiolipin antibodies were positive in 10 cases and 4 controls with no significant different between case and control.

**KEYWORDS:** Anti-Cardiolipin Antibodies, Renal failure, Sudan

## INTRODUCTION

Renal failure (RF) 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 extracellular fluids. The underlying cause may be renal disease, systemic disease, or urologic defects of nonrenal origin. Renal failure can occur as an acute or a chronic disorder. Acute renal failure is abrupt in onset and often is reversible if recognized early and treated appropriately. In contrast, 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.[1]

10% of the population worldwide is affected by renal failure and millions die each year because they do not have access to affordable treatment.[2] According to the 2010 global burden of disease study, renal failure was ranked 27th in the list of causes of total number of death worldwide in 1990, but rose to 18th in 2010.[3] Renal failure is a worldwide health crisis. For example, in the year 2005, there were approximately 58 million deaths worldwide, with 35 million attributed to renal failure, according World Health Organization.[4]

Renal failure can result in significant disorder of haemostasis. Both bleeding diathesis and hypercoagulable state may be caused by these abnormalities.[5]

Renal failure (RF) and renal insufficiency is associated with many complicated health problems such as increasing of the titer of Anticardiolipin antibody, high titers of ACL which found in patients undergoing hemodialysis, a setting in which vascular access thrombosis is very common.[6] The presence of Antiphospholipid increases the risk of development of

post-transplant renal thrombosis.[7] High titers of both Anticardiolipin and lupus anticoagulant (LA) antibodies have been demonstrated in patients with renal failure than the general population.[8]

Anticardiolipin (ACL) is the most commonly investigated APL in relation with several diseases as renal failure, systemic thrombosis, cerebral ischemia, deep vein thrombosis, pulmonary embolism and myocardial infarction. The three most clinically significant are lupus anticoagulant, anticardiolipin antibodies and anti- B2 glycoprotein I antibodies.[9]

Cardiolipin is a phospholipid found in inner mitochondrial membrane primarily, but it is also a minor constituent of mammalian membranes in general, where it constitutes about 20% of the total lipid composition. Anticardiolipin antibodies (ACL) are most frequently determined antiphospholipid antibodies.[10] Within normal population, the frequency of ACL ranges between 1% in normal pregnancies and 5.6%, in blood donors.[11] Increased levels of ACL were found in acute infections (up to 32%), in renal failure (4% - 25%), in medication-induced lupus (47%) and also in elder people without any characteristic symptoms (51%).[12] Anticardiolipin antibodies (ACA) are a subgroup of anti-phospholipid antibodies, and the IgG and IgM isotypes are the most important.[13]

## MATERIALS AND METHODS

This study is a case-control study, conducted in Khartoum, Sudan, in the period from April to June 2017. One hundred samples from Sudanese population included in this study (50 of them were diabetic patients and other 50 as a healthy control) all of them were evaluated to determine antiCardiolipin antibodies. The antiCardiolipin antibodies of the study participants was determined by using ELISA method. Blood samples were collected from all subjects in EDTA containers for determine of antiCardiolipin antibodies using ELISA method, TWBCs and platelets using Sysmex kx21-N Analyzer. This study was approved by ethical committee of ministry of health, and informed consent was obtained from each participant before sample collection.

### Immune Assay

IgAGM anti-cardiolipin assayed using in vitro ELISA (Enzyme-Linked Immunosorbent Assay) kit is designed for the accurate quantitative measurement of igAGM class antibodies against Cardiolipin in Human serum and plasma. A 96-well plate was pre coated with Cardiolipin and β2-Glycoprotein complex antigens to bind cognate antibodies .samples were added to the wells and incubated. Following washing, a horseradish peroxidase (HRP) labeled anti-Human igAGM conjugate was added to the wells, which binds to the immobilized Cardiolipin-specific antibodies. TMB is then catalyzed by the HRP to produce a blue color product that changes to yellow after adding an acidic stop solution. The density of yellow coloration is directly proportional to the amount of Cardiolipin igAGM sample captured in plate.

### Statistical Analysis

The data analyzed using SPSS21, with reference P-value .05. Descriptive statistics of quantitative variable (mean±SD).

## RESULTS

This study included 100 subjects (50 cases and 50 controls). IgAGM anticardiolipin antibodies were positive among 14 (14%), out of 14 positive results 10 (71.4) were positive in the case group while 4 (28.6%) were positive in control group, negative result was 40 (47.1%) in case and 45 (52.9%) in control group. There is no significant different between case and control with (P.Value 0.080).

The descriptive statistics for quantitative variables showed that (mean±SD) of TWBCs in case and control were (7.661 ± 2.161) and (6.183 ± 1.235), respectively. TWBCs were significantly higher in the case group `than control (P=0.000). Platelets didn't show significant difference between case and control (P=0.754). (Table1)

**Table (1): shows statistics and mean differences of age, IgAGM anticardiolipin, TWBCs and PLT among case and control groups.**

| | group | N | Mean | Std. Deviation | P .value |
|---|---|---|---|---|---|
| age | control | 50 | 42.45 | 15.500 | 0.437 |
| | case | 49 | 45.26 | 14.784 | |
| IgAGM anticardiolipin | control | 50 | 8.2678 | 2.11304 | 0.080 |
| | case | 49 | 8.7263 | 2.46477 | |
| TWBCs | control | 50 | 6.183 | 1.235 | 0.00 |
| | case | 49 | 7.661 | 2.161 | |
| Plt | control | 50 | 262.46 | 60.407 | 0.754 |
| | case | 49 | 250.33 | 128.478 | |

## DISCUSSION

Renal failure is associated with oxidative and carbonyl stress, micro-inflammation and other mechanisms, which may contribute to the complications, accelerated atherosclerosis, higher rate of infectious complications, and to the increased morbidity and mortality of patients.

Our study showed that IgAGM anticardiolipin antibodies are positive in14 (14%) in 100 participants. Positive

results were10 (71.4%) in the case groups while 4 (28.6%) were in control group. There was no significant different between case and control with P.Value 0.080. This result agrees with study done by Yetman D.L*et al* (8). The mechanism of increase in APL in hemodialysis patients is unknown. The search for factors involved in APL occurrence in our patients showed no relation between APL and age or sex.

Our study also show that TWBCs were significantly higher in the case group `than control (P=0.000). Platelets didn't show significant difference between case and control (P=0.754).

## CONCLUSION

IgAGM anticardiolipin antibodies were positive in 10 cases and 4 controls with no significant different between case and control.

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