

**ASSESSMENT OF COAGULATION PROFILES AMONG SUDANESE PATIENTS WITH CHRONIC RENAL FAILURE**

Nada Omer Alseedig\*<sup>1</sup>, Raian Bakhet Yassein<sup>2</sup>, Siham Khalifa Abd Allah<sup>3</sup>, Areeg Alsail Mohammed<sup>4</sup>,  
Nosiba Abdelmajid Alballah<sup>5</sup>, Mohamed Abdelrahman Syid<sup>6</sup>

<sup>1</sup>Haematology Department, Faculty of Medical Laboratory Sciences, Shendi University, Sudan.

<sup>2-3-4-5</sup>Haematology Department, Faculty of Medical Laboratory Sciences, Shendi University, Sudan.

<sup>6</sup>Haematology Department, Faculty of Medical Laboratory Sciences, Shendi University, Lecturer, Sudan.

\*Correspondence for Author: Nada Omer Alseedig

Haematology Department, Faculty of Medical Laboratory Sciences, Shendi University, Lecturer, Sudan.

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**ABSTRACT**

Renal disease is a common cause of death and disability in Sudanese patients. Chronic kidney disease (CKD) is a common threat to critically ill patients in intensive care units with a mortality rate ranging from 42% to 88%. Treatment methods such as dialysis and transplantation are becoming more effective in life threatening conditions. This study was conducted to assess the coagulation profile level in chronic kidney failure patients and comparison was made with age matched controls. Totally one hundred members were selected for the study, fifty members were chronic kidney failure patients and fifty members were normal healthy subjects served as controls. The results of this study showed that mean of Prothrombin time (PT) and international normalization ration (INR) were exhibited significant increased which decreased significantly depend on the duration of disease.

From our study we concluded that presence of variation in coagulation profile among Sudanese chronic kidney failure patients when compare with control. Coagulation profile affects the circulatory system which progress many health hazards. Coagulation profiles give information about status and clinical course of disease. Regular monitoring of coagulation profile in CKF patients improves the quality of life.

**KEYWORDS:** Chronic kidney failure, Prothrombin time (PT), international normalization ration (INR), Sudan.

**INTRODUCTION**

Chronic renal failure is currently known as Chronic Kidney Disease (CKD) or Chronic Renal Insufficiency (CRI) implies long standing, progressive and irreversible renal parenchyma disease resulting in diminished renal function up to 40 to 60%.<sup>[1]</sup>

The National Kidney Foundation rates ESRD as fifth stage among CKD, which is based on the presence of kidney damage and level of kidney function whereas GFR <15 ml/min/1.75m<sup>2</sup> for ≥ 3 months. The ESRD patients require a regular course of dialysis or kidney transplantation to maintain life. Although dialysis is life saving and prolongs survival, it is only temporary and does not replace all of the renal functions.<sup>[2]</sup>

Hemostasis is the process that maintains the integrity of the circulatory system after vascular damage. It is a dynamic and tightly regulated process that we are just beginning to understand. Under normal circumstances, vessel wall injury rapidly initiates a series of coordinated events designed to seal the breach generated by the injury. These events lead to clot formation and require

both platelet recruitment and activation as well as the generation of thrombin and fibrin.<sup>[3]</sup> In addition, this process is modulated by multiple mechanisms that contain it, thus preventing the otherwise imminent vascular inflammation and tissue damage.<sup>[4]</sup> Coagulation abnormalities associated with renal disease are seen in chronic renal failure, acute renal failure, nephritic syndrome, glomerulonephritis, neoplasm and renal transplantation. Abnormal platelet function occurs due to accumulation of toxic metabolites. hypercoagulopathy with predisposition to thrombosis can also occur, Fibrinolytic activity, anti-thrombin III and protein C are all reduced and factors V, VII, VIII and X are increased.<sup>[9]</sup> Deficiencies of platelet function or of the coagulation cascade typically lead to bleeding disorders, whereas platelet hyperreactivity and abnormalities in the regulatory mechanisms may result in excessive thrombin formation and pathological thrombosis. Patients at various clinical stages of chronic kidney disease (CKD) display a wide range of derangements in all three aspects of hemostasis, and they experience a wide spectrum of clinical manifestations that lead to considerable morbidity and mortality in this patient population, one that spans prothrombotic tendency leading to excessive

cardiovascular events, as well as platelet dysfunction leading to increased bleeding tendency<sup>(5)</sup>. This study was primarily conducted to assess the coagulation profile parameters, Prothrombin time (PT) and INR, in chronic renal failure patients.

## MATERIALS AND METHODS

Totally (100) subjects were selected for the study. Among them (50) were chronic kidney failure patients and (50) members were normal healthy subjects served as controls. The study was conducted in Shendi University, Shendi, Sudan. The investigations were performed on venous blood sample drawn into trisodium citrate tubes. All the samples were processed for analysis immediately after the collection of samples from the patients. Coagulation profile; prothrombin time i.e measures the time taken by plasma to clot in the presence of an optimal concentration of tissue extract (Thromboplastic) were measured using Coagulometer instrument, INR calculated from known formula. Written informed consent was obtained from each patient before participation.

## RESULTS AND DISCUSSION

From our study we collected totally (100) blood samples for analysis. Among them (50) were chronic kidney failure patients and (50) members were normal healthy subjects served as controls. Both the groups were age matched and comparison of coagulation profile was done. Among the study population (57%) were males and (43%) were females in total population. The mean age of the whole study population was around (45.5 years). Prothrombin time (PT) was increased in chronic kidney failure patients when compare to control group, the mean value was around (41.9 seconds), (12.6 seconds) respectively, P.value (0.001). INR was increased in chronic kidney failure patients when compare to control group, the mean value was around (3.50), (0.97) respectively, P.value (0.001). P.value of both PT and INR was less than 0.05 that mean it was highly significant variation between case and control group which confirm that renal failure lead to increase PT and INR. In a study conducted by Ramaprabha P, Bhuvanewari T and R. Aravind Kumar in India in 2014, report that chronic kidney failure cause increased PT and INR which was in agreement to our finding in this study<sup>[6]</sup>, but also our study disagreement to study done Shaikh Zayed Hospital, Lahore which showed normal results.<sup>[7]</sup> Disturbance of coagulation and fibrinolysis have been reported in patients with chronic kidney disease. Studies of different coagulation and fibrinolytic parameters have yielded conflicting results with some indicating suppressed fibrinolysis and other showing increased fibrinolysis.<sup>[8]</sup>

The mean of PT in duration (1 – 3 years) was (55.8 seconds), (4 – 6 years) was (19.2 seconds), and in duration (more than 6 years) was (12.4 seconds). The mean of INR in duration (1 – 3 years) was (4.7), (4 – 6

years) was (1.5) and in duration (more than 6 years) was (0.94) with P.value of both (0.000 and 0.000 respectively), which was means that the level of PT and INR decreased significantly according to duration of disease.

## CONCLUSION

From our study we found that presence of variation in coagulation profile among Sudanese chronic kidney failure patients when compare with control. Coagulation profile affects the circulatory system which progress many health hazards. Coagulation profiles give information about status and clinical course of disease. Regular monitoring of coagulation profile in CKF patients improves the quality of life.

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