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EVALUATION OF C-REACTIVE PROTEIN FOR EARLY DETECTION OF KIDNEY IMPAIRMENT IN SUDANESE PATIENTS WITH HYPERTENSION AND TYPE 2DIABETES MELLITUS IN KHARTOUM STATE

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ABSTRACT
Background: C-reactive protein is a marker used for detection of chronic kidney disease in high risk patients (hypertensive and type 2 diabetes). **Methodology:** case-control study involving 75 subjects, age 40_80 years and different gender. Patients classified into diabetic patients with different duration and hypertensive patients also with different duration and control group. Renal function tests (urea and creatinine) and C-reactive protein were estimated. **Results:** A total of 75 patients included in the study, of whom 50% diabetes and hypertensive patients, diabetic male 5 (20%) and female 19(80%), hypertensive male 8 (32%) and female (68%), 25% apparently healthy subjects 14 (56%) Males and 11(44%) females. Glucose level and CRP were significantly increased in diabetic patients when compared to control group (p value = 0.00, 0.05) respectively. CRP was significantly increased in hypertensive patients compared to control group (p value=0.05). The correlation between duration of type 2 diabetes and hypertension and CRP levels was statistically significant compared to control group (p value = 0.04, 0.002) respectively. **Conclusion:** C-reactive protein was significantly increased in high risk population and correlate with diabetes and hypertension duration, it might serve as marker for early detection of chronic kidney diseases in such population.

KEYWORDS: C-reactive protein (CRP), Chronic kidney diseases (CKD).

INTRODUCTION
Diabetes is a group of metabolic disorders characterized by increase glucose level due to defect in insulin secretion.[1] It can affect the kidney and cause renal failure.[2]

Blood pressure is the force of blood against blood vessels. Once it increases it causes hypertension. Hypertension has a harmful impact against blood vessels, by reducing blood supply to the kidney, resulting in damaging the nephron. Once the nephron damaged, the kidney will stop excretion of waste and extra fluids from the body.[3] Chronic kidney disease: is gradual reducing in renal function over time. Early detection and treatment are needed to stop progression to kidney failure and complication such as coronary vascular disease.[4]

C-reactive protein: non-glycosylated polypeptide with five identical subunits. Each subunit consisted of 206 amino acid recedes bound by non-covenant bound.[5]

CRP synthesized in liver and is 0ne of the first acute-phase proteins, increased in inflammatory disorder[4], and it's associated with chronic kidney diseases.[6] Aim of this study to evaluate C - reactive protein in diabetes mellitus type 2 and hypertensive patients to detect early kidney injury.

DANAE.KING et al in their study showed that the people with diabetes, the level of CRP is significantly higher.[7] Rajesh Kumar et al[8] in their study showed that the level of c _reactive protein is significantly higher in people with hypertension.

MATERIALS AND METHODS
A case control study was conducted involving 75 subjects with different genders and age (above 40 years), in Khartoum state in period from January to March (2017). Subjects defined as patients with diabetes type 2 or hypertensive with different duration.

This study approved by Faculty of Medical Laboratory Sciences-University of Khartoum ethical committee, all participants was given the written informed consent before inclusion in the study.

The laboratory test was performed under controlled condition, the two controls normal and pathological

within the reference range. Samples were taken in lithium heparin and plasma was separated and saved in -20C. Parameters measured using fully automated analyzer, C-reactive protein was measured by NYOCARD CRP single test which is a solid phase sandwich form immunometric assay. Creatinine was measured by Jaffe reaction and urea by Berthelot reaction in COBAS 400 chemistry analyzer.

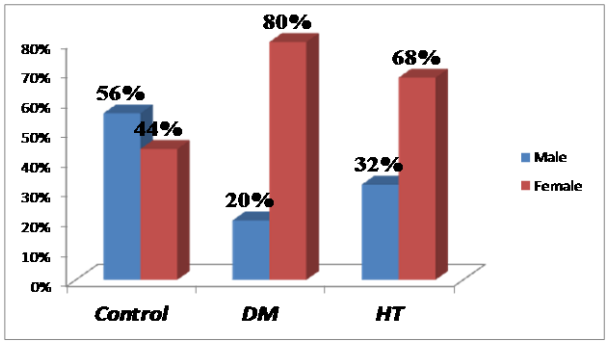
Patients were divided into sub groups according to duration of disease, diabetic patients with duration (<5,<10 and more than 10 years). Hypertensive patients with duration (<5, <10 and more than10 years).

All data were input into SPSS version 21.0 statistical analysis software. The measurement data were expressed as mean ±2 standard deviation, Independent ***t*** test was applied to compare the study parameters means in case and control groups.

Pearson correlation was used to study the correlation between the study parameters and study variables.

P value less than or equal to 5% (≤.05) consider as significantly different.

RESULTS



A total of 75 participants were enrolled in this study, 25 hypertensive, 25 diabetic patients type 2 and 25 healthy patients.

The mean age was match in all groups. General distribution among the study group showed, 50% diabetic and hypertensive patients: Diabetic 5(20%) male and 19 (80%) female, hypertensive 8(32%) male and 17(68%)female. 25% apparently healthy subject14(56%) males and 11(44%) females.

Table 1: showed that glucose level and C - reactive protein was significantly increased in diabetic patients when compared to the control group. (P-value = 0.00, 0.05) respectively.

Parameters	Control (Mean±SD)	DM (Mean±SD)	P-value
Glucose	103.04±17.59	222.16±93.35	0.000
Urea	21.36±7.98	24.24±8.59	0.226
Creatinine	0.86±0.22	0.95±0.27	0.054
CRP	1.84±1.53	3.05±2.64	0.050

Table 2: showed that level of C-Reactive protein was significantly different in hypertensive compared to control group (p = 0.005).

Parameters	Control (Mean±SD)	HT(Mean± SD)	P-value
Urea	21.36±7.98	19.04±5.14	0.228
Creatinine	0.87±0.22	0.93±0.22	0.287
CRP	1.84±0.31	5.54±1.22	0.005

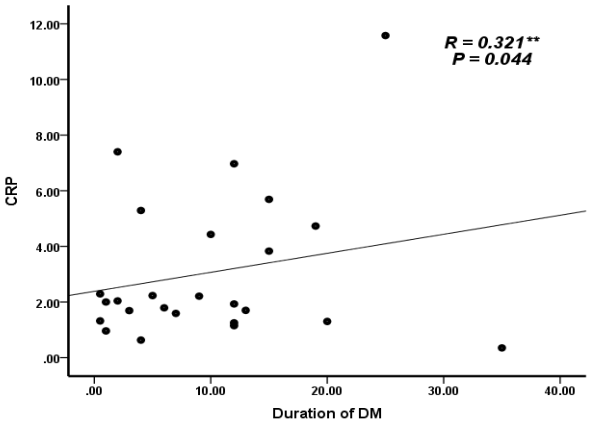


Figure 1: Pearson correlation of C - reactive protein with duration of diabetes was positively increased (R= 0.321, P-value=0.044)

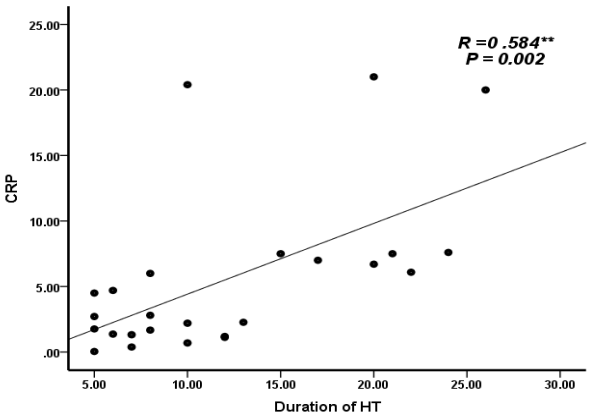


Figure 2: C-Reactive protein level was positively correlated with duration of hypertension (R= 0.584, P= 0.002)

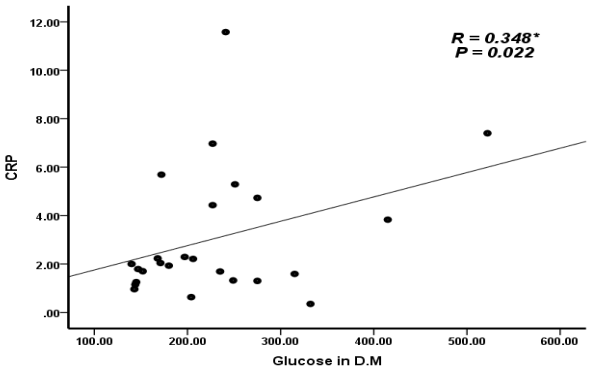


Figure 3: Pearson correlation of C reactive protein with glucose in diabetes was positively increased (R=348, P=0.022)

DISCUSSION

Chronic kidney disease is a gradual reducing in renal function over time.[4] Diabetes and hypertension can affect kidney and damage nephron causing renal failure.[2, 3] C-reactive protein is associated with chronic kidney diseases.[6]

In the present study there is a strong association between diabetes mellitus or hypertension and CRP levels, in addition to a positive correlation between C _reactive protein and duration of diabetes and hypertension. These findings agreed with DANA E. KING et al[7] in their study which showed that CRP is significantly increased in diabetic patients, also agreed with Rajesh Kumar et al[8] in their study which showed that CRP is significantly increased in hypertensive patients.

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CONCLUSION

C-reactive protein was significantly increased in high risk population and correlated with diabetes and hypertension duration, it might serve as marker for early detection of kidney injury.

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