



ORIGINAL RESEARCH PAPER

General Medicine

STUDY THE RELATIONSHIP BETWEEN HS-CRP LEVEL AND URINARY ALBUMIN CREATININE RATIO (UACR) LEVELS

KEY WORDS: C-reactive protein (CRP), Inflammation, Urinary albumin creatinine ratio (UACR).

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ABSTRACT

BACKGROUND: C-reactive protein (CRP), an acute phase reactant, is a highly sensitive marker of inflammation. **METHODS:** Hospital based cross-sectional Study was conducted at Department of medicine on Type 2 diabetes patients reporting to OPD & IPD of Medicine Department. **RESULTS:** Mean hs-CRP in UACR group <30 was 1.641.31 mg/l and in >30 it was 6.083.1 mg/l and this difference was found statistically highly significant (p<0.001). **CONCLUSION:** We found hs-CRP is high in microalbuminuria group compared to normoalbuminuria group. It was also found in our study that diabetic nephropathy is associated with hs-CRP level.

INTRODUCTION

Diabetic nephropathy is the single most common cause of chronic renal failure, accounting for 45% of patients receiving renal replacement therapy, and is a rapidly growing problem worldwide.

Recent evidence suggest that chronic subclinical inflammation may play a key role in the initiation and progression of diabetic nephropathy and finally leads to the development of glomerulosclerosis and tubulointerstitial fibrosis¹. Recent studies suggest that proinflammatory cytokines such as interleukin (IL)-1, IL-6, IL-8, and tumor necrosis factor play a role in the pathogenesis of diabetic nephropathy²

C-reactive protein (CRP), an acute phase reactant, is a highly sensitive marker of inflammation. Its level rises dramatically during an inflammatory process. CRP has a long half life, affordability of estimation and stability of its levels with no circadian variation and therefore is one of the best markers of vascular inflammation³. CRP has been found to be associated with disorders like diabetes mellitus (DM), cardiovascular disorders, metabolic syndrome, renal failure, etc³. Serum high sensitivity CRP (hs-CRP) level is higher in patients with type 2 diabetes mellitus than in normal subjects and plays an important role in the development and progression of type 2 diabetes mellitus⁴.

MATERIALS AND METHODS

Study Design: Hospital based cross-sectional Study
Study population: Type 2 diabetes patients reporting to OPD & IPD of Medicine Department.
Sampling Method: Random Sampling

a. Inclusion criteria:

- I. Type 2 Diabetes Mellitus (according to WHO diagnostic criteria) patient receiving either oral hypoglycemic agents or insulin or both
- ii. Willing to participate
- iii. Type 2 Diabetes Mellitus patients having Normoalbuminuria or Microalbuminuria [urinary albumin creatinine ratio <300 µg/mg]

Diagnostic criteria for diabetes mellitus:

- 1. Fasting blood sugar > 7.0mmol/L(126mg/dl) or
- 2. HbA_{1c} > 6.5%
- 3. Two hour plasma glucose > 11.1mmol/L(200mg/dL) during an oral glucose tolerance test
- 4. Symptoms of diabetes plus random blood glucose concentration > 11.1mmol/L(200mg/dL)

b. Exclusion criteria:

- I. Patients with type 1 diabetes mellitus.

- ii. Not willing to participate
- iii. Have suffered from any acute illness in past 1 week
- iv. Patient with macroalbuminuria (UACR>300 µgm/mg)
- v. Patient with pre-existing renal disease eg polycystic kidney disease,
- vi. Type 2 DM patients having cardiovascular disease.

OBSERVATIONS

In present study, overall mean age in females was 57.53 8.23 and in males it was 58.958.23 years. Mean age of onset in females was 49.396.30 and in males it was 49.735.45 years while mean duration of diabetes in females was 8.144.92 years and in males it was 9.235.70 years and these differences were found statistically insignificant (p>0.05).

Table 1
Distribution of Cases according to UACR in relation to hs-CRP Group

hs-CRP Group(mg/l)	UACR Group (µg/mg)	
	<30	≥30
Mean	1.64	6.08
SD	1.31	3.1
P	<0.001	

Mean hs-CRP in UACR group <30 was 1.641.31 mg/l and in ≥30 it was 6.083.1 mg/l and this difference was found statistically highly significant (p<0.001).

DISCUSSION

In our study, overall mean age in females was 57.53 8.23 years and in males it was 58.958.23 years. Mean age of onset in females was 49.396.30 years and in males it was 49.735.45 years while mean duration of diabetes in females was 8.144.92 years and in males it was 9.235.70 years and these differences were found statistically insignificant (p>0.05).

Mean hs-CRP in UACR group <30 was 1.641.31 mg/l and in ≥30 it was 6.083.1 mg/l and this difference was found statistically highly significant (p<0.001).

Similar observed made by Navarro et al⁵ they studied patients with type 2 diabetes and revealed that CRP levels were high in patients with microalbuminuria or mild proteinuria compared with those with normoalbuminuria. Saraheimo et al⁶ evaluated the association between CRP levels and diabetic nephropathy in 194 patients with type 1 diabetes and found that CRP was higher in patients with micro- and macroalbuminuria compared with those without⁶.

CONCLUSION

Recent evidence suggests that chronic subclinical inflammation may play a key role in the initiation and

progression of diabetic nephropathy. C-reactive protein (CRP), an acute phase reactant, is a highly sensitive marker of inflammation. We found hs-CRP is high in microalbuminuria group compared to normoalbuminuria group. It was also found in our study that diabetic nephropathy is associated with hs-CRP level.

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