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Research Article

**SEVERITY OF SERUM C-REACTIVE PROTEIN IN RELATION
TO GENDER AND DURATION OF METABOLIC SYNDROME****Dr. Kiran Hafeez ^{1*}, Dr. Muhammad Adnan Bawany ¹, Dr. Shamsuddin Solangi ¹, Dr. Hamid Nawaz Ali Memon ², Dr. Imran Karim ³, Dr. Samreen ⁴ and Dr. Zulfiqar Ali Qutrio Baloch ⁵**¹ Isra University Hospital Hyderabad, Sindh, Pakistan² Zulekha Hospital Dubai United Arab Emirates³ Liaquat University Hospital Jamshoro Sindh Pakistan⁴ National Institute of Cardiovascular Diseases [NICVD] Karachi⁵ Brandon Regional Hospital Brandon, Florida, U.S.A**Abstract:****Objective:** To determine the severity of serum C-reactive protein in relation to gender and duration of metabolic syndrome.**Patients and Methods:** The six months cross sectional study covers fifty individuals diagnose as metabolic syndrome visited / admitted at tertiary care hospital were enrolled and recruited in the study. The metabolic syndrome was diagnosed according to the IDF criteria. All the patients with metabolic syndrome was screened and evaluate for severity of serum C-reactive protein. The data saved on pre-designed proforma and analyzed in SPSS 16 while the mean \pm SD, frequencies and percentages was calculated.**Results:** Total 98 patients were documented as raised CRP in patients with metabolic syndrome, of which 73 (74.5%) were females and 25 (25.5%) were males. The mean age \pm SD for the population with raised CRP was 47.97 ± 7.98 (years) while the mean \pm SD for CRP 22.9 ± 6.75 mg/L in patients with metabolic syndrome. In male population the raised serum CRP in terms of mild, moderate and severe was 12 (48%), 10 (40%) and 03 (12%) while in females population the raised serum CRP in terms of mild, moderate and severe was 35 (47.9%), 27 (36.9%) and 11 (15%) and the severity also directly proportional to the duration of metabolic syndrome.**Conclusion:** It has been found that the serum CRP level is directly proportional to duration of metabolic syndrome.**Keywords:** Metabolic syndrome and C-reactive protein.**Corresponding author:***** Dr. Kiran Hafeez,**

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INTRODUCTION:

The metabolic syndrome (MetS) includes lipid and blood glucose disturbance, hypertension, obesity, abdominal obesity, hypertension and insulin resistance and is associated with coronary heart disease and diabetes mellitus [1-3]. The initiation of inflammatory marker is a best tool to evaluate the severity of inflammatory process and the metabolic syndrome as far as management and monitoring of the disease is concerned [4-6]. It has been emerged the role of C-reactive protein (CRP) as a inflammatory marker and responsible for insulin resistance and diabetes mellitus and metabolic syndrome along with cardiovascular events regardless of existence of common risk factors. Furthermore it has also been known that CRP can also be taken as diagnostic marker for metabolic syndrome as adipose tissue in obesity also releases various adipokines responsible for various cardiovascular events and includes plasminogen activator inhibitor, adiponectin and other bioactive products [7, 8]. Former literature reported the high burden of metabolic syndrome in Asian population and as it has been found the CRP can acts as a diagnostic and prognostic markers in patients with metabolic syndrome [9, 10], thus this study will be conducted to evaluate the severity of C-reactive protein in patients with metabolic syndrome so that early and appropriate measures can be taken to reduce the burden of abnormal cardiovascular and cerebrovascular events.

PATIENTS AND METHODS:

The six months cross sectional study covers fifty individuals diagnose as metabolic syndrome visited / admitted at tertiary care hospital were enrolled and recruited in the study. The Metabolic syndrome was diagnosed according to the IDF criteria while all the patients with acute myocardial infarction, stroke, pregnant ladies, known cases of connective tissue disorders, already on antibiotic or immunosuppressive therapy and malignancy were excluded. The relevant patient had detail clinical history, physical examination, blood glucose level and fasting lipid profile while the CRP was also estimated whereas the waist circumference was also assessed after taking informed consent. The severity of the CRP (mild = <10 mg/l, moderate 10-50 mg/l and severe >50 mg/l) was correlated with metabolic syndrome while the data was collected on proforma and analysis in SPSS 16. The frequencies, percentages and mean \pm SD was calculated for study variables.

RESULTS:

Total 98 patients were documented as raised CRP in patients with metabolic syndrome, of which 73 (74.5%) were females and 25 (25.5%) were males. The mean age \pm SD for the population with raised CRP was 47.97 \pm 7.98 (years) while the mean \pm SD for CRP 22.9 \pm 6.75 mg/L in patients with metabolic syndrome. Of 98 patients the severity is mentioned in Table 1-2 respectively.

Table 1: The Severity of Serum CRP In Relation To Gender

RAISED CRP	GENDER (N=98)	
	Male (n=25)	Female (n=73)
Mild	12 (48%)	35 (47.9%)
Moderate	10 (40%)	27 (36.9%)
Severe	03 (12%)	11 (15%)

Table 2: The Severity of Serum CRP in Context to Duration of Metabolic Syndrome

RAISED CRP	DURATION (yrs)		
	1-2 (n=17)	2-3 (n=50)	>3 (n=31)
Mild	08 (47%)	30 (60%)	09 (29%)
Moderate	07 (41.1%)	15 (30%)	15 (48.3%)
Severe	02 (11.7%)	05 (10%)	07 (22.5%)

DISCUSSION:

The CRP is an inflammatory marker responsible for various abnormal cardiovascular events and also plays a key role in the development of insulin resistance [9, 10]. In former literature various epidemiological studies concentrated on CRP and its prognostic importance in diabetes mellitus and coronary artery disease [11-13]. The severity of CRP is directly proportional to the duration and severity of metabolic syndrome and it has been found that is it inexpensive, widely available, validates and standardized measure similar to serum cholesterol level [14, 15]. With time it has been identified that it has the best diagnostic worth for metabolic syndrome and its level can be correlate with the various cardiovascular and cerebrovascular adverse events [16]. In current t series, the mean \pm SD for CRP is high and has directly proportional to the components of the metabolic syndrome which shows the direct relationship to assess and estimate the severity, the findings are consistent with the study by Bo S, et al [17]. Mahajana A, et al [18] also found the significant elevation of CRP in patients with metabolic syndrome compared to subjects without metabolic syndrome. The strong linear augmentation of CRP values was identified as the number of components of metabolic syndrome increased and has been suggested that higher the CRP level the higher will be the disturbance in the components of the metabolic syndrome and the more will be the risk for occurrence of cardiovascular and cerebrovascular events.

CONCLUSION:

It has been found that the serum CRP level is directly proportional to duration of metabolic syndrome; hence the raised CRP can be considered as inflammatory marker for metabolic syndrome and is a risk factor for insulin resistance and cardiovascular events.

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