Original Article

Correlation of C Reactive Protein Elevation with Hypertension in Tertiary Care Hospital

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ABSTRACT

Objective: To determine the correlation between serum CRP levels and high blood pressure in hypertensive patients.

Study Design: Observational / descriptive study

Place and Duration of Study: This study was conducted at the Medicine OPD of LUMHS, Jamshoro from May 2016 to November 2016.

Materials and Methods: This study was conducted on 101. All the hypertensive patients were incorporated, after taking informed consent while, smokers, diabetics, patients having any infection, and any other co morbidity were excluded from the study to avoid bias in the results. Blood samples were taken for assessment of C reactive protein. Information was gathered on self-made proforma.

Results: Mean age of the participants was 41±2.03 years. Majority of the cases 60(59.40%) were noted with age group of >40 years. 55(54.77%) patients were male while 14(13.86%) were female. Mean SBP was 146.66±18.99 mm Hg, mean diastolic blood pressure was 96.50±10.59 mm Hg and mean CRP was 0.8+0.10 mg/dL.65.35% patients had elevated C reactive protein. Positive correlation was found between CRP andSBP R-value 0.36 and also positive correlation was noted between CRP and DBP r=value 0.38.

Conclusion: CRP elevation was positively correlated with hypertension, but not strongly correlated.

Key Words C reactive protein, hypertension, Co-relation

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INTRODUCTION

Hypertension (HTN) is the typical, asymptomatic, promptly detectable and for the most part effortlessly treatable sickness that prompts to deadly difficulties if left untreated.[1] In the world over around 1 billion peoples having HTN"333 million in financially created and 639 million in the economically developing countries".[2] It is most often is asymptomatic in nature which leads to dangerous complications in untreated cases. Around 7.6 million mortality and 92 million inabilities worldwide were elementable to hypertension in 2001. It is the common cause of atherosclerosis and various cardiovascular diseases CVDs like CHD, renal failure, CHF, ischemic stroke and the peripheral vascular disease.[3] HTN is the multi factorial attribute that outcomes from net impact of ecological and hereditary constituents. Elements that may add to HTN incorporate plenty salt in the diet or alcohol consumption, depression, aging, hereditary qualities physical idleness, rich fat saturated diets and the family history.

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Inflammation considered as the commonest pathogenic element in the development of pulmonary arterial hypertension (PH) with several studies showing a significant association between systemic inflammatory markers and PH.[4] Inflammation is also a precursor for the atherosclerosis progression and systemic hypertension. CRPisthe plasma protein, having "≤1mg/L" in normal cases with levels elevate 100 fold in the injuries, inflammation and infection's response. CRP impulsive the "somatic C-polysaccharides of the pneumoniae by streptococcus bacteria and 1st acute phase of the protein to be labled.[5] CRP primarily synthesize through hepatic response to "IL-6" and "IL-1 β", and the risk valuation marker, and had good factsasthe stable, with big half-life as nineteen hrs and demonstrated minor alterations in the levels in b/w fresh and the frozen forms which makes it as a good marker for diagnostis.[2] In 2001, Bautista et al, 1st time evaluate the CRP levels in in hypertensive cases and found it is the independent risk factor for hypertension development.[6] Elevated CRP can development the HTN by reduction of endothelium-dependent relaxation by decreasing nitric oxide in the endothelial cells, in outcome vasoconstriction and improved endothelin1 production.[7] CRP can also encourage the atherosclerosis by highly regulating angiotensin 1 receptor manifestation.[8] HTN, if not treated timely than in the cases may develop lethal complications and may result in morbidity and mortality. HTN is commonest

health issue in population in developing nations and also major cause for CVD and it has been stated that HTN is the portion of inflammation and many researchers reported that increases of CRP in HTN cases. To best of our knowledge, we had conducted this study on relationship of CRP and hypertension in our setup.

MATERIALS AND METHODS

This observational descriptive study was containing on 101 cases attending medicine OPD of LUMHS over a time of 7 months; May 2016 to November 2016. All the hypertensive patients were incorporated after taking informed consent while, smokers, diabetics, patients having any infection, endocrine pathologies, Recent illness, previous history of IHS, MI, stroke, PVS and other vasculitis Chronic inflammatory diseases like Systemic Lupus Erythromatosis, and any other co morbidity were excluded from the study to avoid bias in the results. After taking thorough history and doing examination, blood was taken for estimation of C reactive protein. Information was gathered on self-made proforma. SPSS version 16 was used for analysis of results.

RESULTS

Total 101 hypertensive cases were selected. Mean age of the participants was 41+- 2.03. 11(10.49%)patients were with age group of < 30 years,30(29.70%)having age group of 30-40 years while 60(59.40%)were noted with age group of > 40 years. 55(54.77%) patients were male while 14(13.86%) were female. Table:1.

Table No.I: Demographic characteristics of Patients n=101

Demographic characteristics	Number / percentages
AGE	
less than 30 years	11(10.49%)
30-40 years	30(29.70%)
More than 40 years	60(59.40%)
Gender	
Male	55(54.45%)
Female	14(13.86%)

Table No.2: Patients distribution according to Hypertension and CRP (n=101)

Blood pressure and CRP	Mean±SD
Systolic blood pressure	146.66±18.99 mm Hg
Diastolic BP	96.50±10.59 mm Hg
CRP	0.8±0.10mg/dL

Mean SBP was 146.66+18.99 mm Hg, mean DBP was 96.50+10 .59 mm Hg and mean CRP was 0.8+0.10 mg/dL. Table: 2.

65.35% patients had elevated C reactive protein Fig: 1.

In this study positivecorrelation had found between CRP andSBP R-value 0.36Fig:2

In our studypositive correlation was found between CRP and DBP R-value 0.38 Fig;3

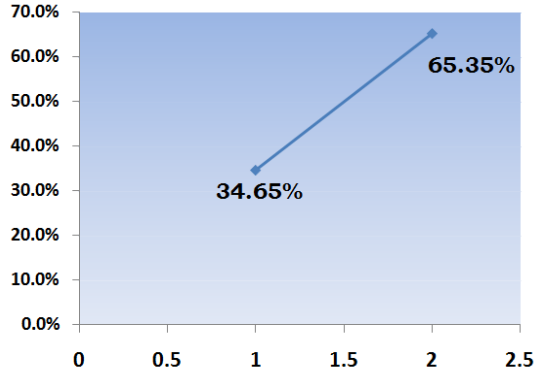

Figure No.1. Patients distribution according to frequency of elevated CRP (n=101)

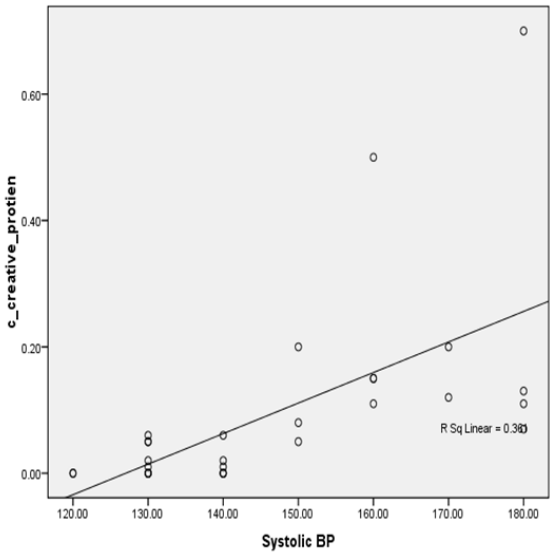

Figure No.2. Correlation between diastolic BP and CRP n=101

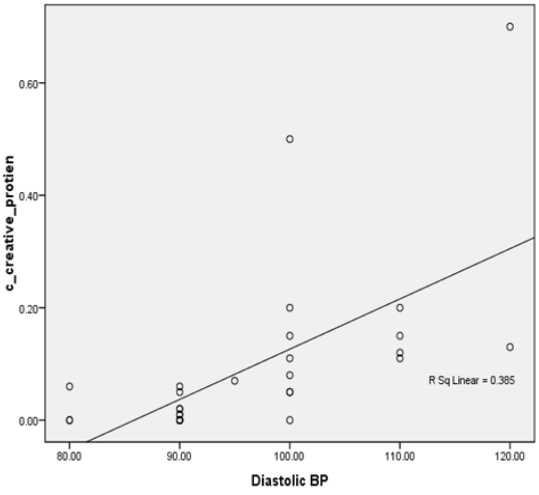

Figure No.3. Correlation between diastolic BP and CRP n=101

DISCUSSION

In present study assessed the correlation of high blood pressure and CRP and we found 65.35% hypertensive patients had increased c-reactive protein. Similar findings were seen in the study conducted by Dawris S.[9] On other hand Sesso and workers mentioned that the elevated level of the CRP is a risk of hypertension development. This correlation between elevated hs CRP and new-onset HTN led Sesso et al to suggested that HTN is the inflammatory disease.[10] The ATTICA study found higher levels of hsCRP, TNF-α and other inflammatory markers in pre-hypertensives. This communication was independent of the other co-existing causes for cardiovascular diseases indicating that pre-hypertension might be an inflammatory condition.[11] HTN may develop to several inflammatory stimulation at walls of vessel those encourage production of pro inflammatory cytokines like as the TNF-α, IL-6 and CRP as the protection against factors of the injuries. Several studies reported that inflammatory markers like as CRP is the particular determinant of endothelium containing vascular function in cases having CHD and this condition can also exist in the cases having HTN.[2,13]

CRP prevents the nitric oxide formation through endothelial cells that in turn encourage vasoconstriction, adhesion of the leukocytes, and activation of the platelets, oxidation and thrombosis. Furthermore elevated CRP may high regulate the receptors of the angiotensin and improve the expression of the activator inhibitor-1 of plasminogen through endothelial cells[13]. These both conditions may develop the BP and promote the atherogenesis. In our study 34.65% smoker cases were with elevated CRP level and CRP mean was 0.8±0.10mg/dL. While in the study conducted by Dar MS et al[2] reported that mean hsCRP in the patients with hypertension is 3.26 mg/L on comparing with normal cases as 1.36 mg/L p-value 0.001. This mean level was very high as compare to our study, this may because in our study sample size is very short. Further Dar MS et al[2] reported that the significant difference of hs-CRP elevation was also seen in cases with shorter hypertensive duration as 1 year, as compare to those cases having hypertension history more than 5 years P-0.01.

Results of this study show that c reactive protein was positively correlated with both SBP and DBP.

CONCLUSION

In the conclusion of this study the C reactive protein was positively correlated with hypertension, while no strong correlation was found, therefore further randomized studies are require to conform the findings of this study.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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