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ORIGINAL ARTICLE

High Sensitivity C-Reactive Protein Level and Ischemic Heart Disease

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ABSTRACT

Aim: To know the relation between serum hs CRP levels and IHD.
Methods: This study was done in the Department of cardiology Hayatabad Medical Complex, Peshawar after approval from the hospital ethical committee. It was a cross-sectional descriptive study. The duration of the study was one and a half years, with a sample of 160 IHD patients.The sample size was calculated based on a universally validated calculator with a 95% confidence interval and a 5% margin of error.
Results: Among the total 160 IHD patients included in this study, 102(63.7%) were male and 58(36.3%) females. Mean±SD age was 57.8±13.7. Among 160 patients, 32(20%) patients were having hs CRP below 1 mg/L, 45(28.1%) patients having between 1 to 3mg/L, and 83(51.9%) patients >3 mg/L. Mean±SD hs CRP level was 4.52±3.2mg/L.
Conclusion: High sensitivity C-reactive proteins (hs CRP) is one of the important risk factors of IHD and its level is directly related to the frequency of IHD
Keywords: Ischemic Heart Disease (IHD), cardiovascular disease (CVD), hs CRP

INTRODUCTION

Cardiovascular Diseases are the most common cause of death worldwide. As per WHO statement, 17.9 million people died of cardiovascular diseases in 2019, among whom 85% were due to IHD[1]. IHD or coronary artery disease (CAD) is simply the ischemia of heart tissue due to atherosclerosis or narrowing of the coronary vasculature. Many major risk factors for IHD have widely been studied which include smoking, diabetes mellites, hypertension, dyslipidemia, obesity, type A personality, alcoholism - apart from non-modifiable factors like age, gender, and ethnicity[2]. But still,studies are showing that a significant number of patients with IHD don't have these risk factors[3]. This gives rise to the idea of in-depth study and research about other markers that might be the risk factor for IHD, like C-reactive protein, homocysteine, fibrinogen, interleukin 6 and 8, amyloid A protein,etc[4].

The objective of the study was to know the relation between serum hs CRP levels and IHD.

METHODOLOGY

The study was done in the Department of Cardiology, Hayatabad Medical Complex, Peshawar from 1st February 2020 till 30th August 2021 after permission from IRB. It was a descriptive cross-sectional study.A sample of 160 patients with IHD was selected calculated based ona universally accepted calculator with a 95% confidence interval and 5% margin of error. Patients with ischemic heart disease (IHD) from both genders with age 18 years and above were randomly selected for the study after approval from the hospital ethical committee. Detailed history with the physical examination was performed in all patients.Patients having coagulation disorders, congenital heart diseases, familial hypercholesterolemia, active infection,malignancy, autoimmune diseases, patients on steroids, and patients with drug abuse leading to coronary vasospasm were excluded from the study. Ischemic heart disease (IHD) was diagnosed by clinical features, electrocardiography, echocardiography, and coronary angiography.

High sensitivity CRP (hs CRP) was measured in a standardized laboratory under the supervision of a well-qualified biochemist. Patients were divided into three (3) groups based on the hs CRP range, group 1 having hs CRP below 1 mg/L, group 2 between 1 to 3 mg/L, and group above 3 mg/L. All the data was analyzed by SPSS version 22. The results were expressed as means ± SD, frequencies, and percentages. Spearman correlation coefficient (Spearman rho) was also calculated to show the relation of serum hs CRP level with the frequency of IHD. All the data were presented as tables.

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RESULTS

Results showed that among 160 total patients included in study 102(63.7%) were male and 58 (36.3%) were females making the ratio of male to female as 1.76 to 1 shown in table 1. Mean (± SD) age was 57.81 (± 13.68), with the youngest patient of 29 years and the oldest one of 80 years of age. Table 2 shows the age-related statistics.While analyzing the hs CRP levels in all these patients, 128 (80%) of the patients were having levels above 1 mg/L. More than half 51.9% of the patients were having levels above 3mg/L (Table 3). Diagram 1 shows the distribution of patients according to hs CRP with the maximum number of patients lying between 2 and 11mg/L.

Table 1: Gender distribution

Stats \ Gender	Male	Female	Total
Frequency	102	58	160
Percentage	63.7	36.3	100

Table 2: Age distribution

Age (yrs)	n	%age	MEAN	SD
18 - 40	43	26.9%	39.07	2.109
41 - 60	54	33.8%	56.85	4.311
> 60	63	39.4%	71.43	5.291
Total	160	100.0%	57.81	13.677

Table 3: Relation of hs crp level with IHD

hs CRP	N=	%age	MEAN hs CRP	S.D.
< 1	32	20.0%	.597	.2163
1 - 3	45	28.1%	2.478	.5308
> 3	83	51.9%	7.148	2.1078
Total	160	100.0%	4.524	3.2035

Correlation coefficient .911*
*Spearman rho significant at 0.01.

DISCUSSION

In our study, 80% of the patients were having higher than 1mg/L of hs CRP levels and a major proportion (64.9%) of these were having hs CRP levels higher than 3 mg/L. In one of his studies, Tong DC et al showed that 55.4% of participants with IHD were having hs CRP levels above or equal to 3mg/L which is in accordance with our findings[5]. He further mentioned that a high level of hs CRP is even associated with the severity of IHD. This was also somehow similar to our finding, as in our study it was found that among patients with IHD having hs CRP level above 3 mg/L, 56.6% of the patients were having a severe disease in the form of ST-segment elevation myocardial infarction (STEMI) and only 4.8% were having a milder disease in the form of angina. In other studies, it is found that higher hs CRP levels are associated

with the severity of IHD and adverse outcome in these patients, which is in accordance with our findings[6,7].

In our study, hs CRP levels are directly related to the frequency of IHD, that is a higher number of patients with IHD were having higher ranges of hs CRP levels (above 3mg/L).Based on his findings Zhuang Q et al classified different ranges of hs CRP according to the level of IHD risk[8]. According to their study hs CRP levels below 1 mg/L are classified as low and those above 3 mg/L as high risk.

This study can help clinicians and cardiologists to predict the risk of IHD on the basis of hs CRP levels. It can also help the clinicians to predict the IHD course, severity, and outcome and thus prior steps can be taken to improve the outcomes.

The major drawback of this study is that the cumulative effect of other concurrent risk factors was not studied rather just one factor that is hs CRP was studied separately and independently.

CONCLUSION

High serum hs CRP level is one of the important findings in patients with IHD and is directly related to the risk of IHD and its severity.

Conflict of interest: Nil

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