Correlation of high sensitivity C-reactive protein (hs-CRP) and HDL cholesterol in healthy south Indian individuals

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Abstract
Introduction: Measurement of high sensitivity C-reactive protein (hs-CRP) and High-density lipoprotein cholesterol (HDL-C) level both are predictive of future of cardiovascular diseases (CVD). However, studies correlating hs-CRP and HDL-C in South Indian population are scanty. **Aims and Objectives:** To analyze Correlation of high sensitivity C-reactive protein (hs-CRP) and HDL cholesterol in healthy south Indian individuals. **Methodology:** This was a retrospective Cross-sectional study carried out at the Department of Cardiology, Chettinad Hospital and Research Institute, Chennai from the medical records of patients evaluated during the period of December 2014 to November 2015 in 990 healthy subjects. This Study was approved by Institutional Ethical Committee. The entire apparently healthy individual were selected from Master Health Check-up for whom hs-CRP and Lipid Profile reports were available. The Persons who were known or suspected to have Cardio Vascular Disease, Hypertension, Diabetes or other infective or inflammatory disorders were excluded from the Study. The Statistical Analysis was done by SPSS Software, Pierson Correlation was applied for Correlation between hs-CRP and HDL-C and the Correlation coefficient R were calculated. **Result:** There is negative correlation is seen between HDL and hs-CRP and the Pearson Correlation coefficient R= -0.089and the negative correlation is statistically significant (P< 0.01*) **Conclusion:** It is found that there is negative correlation is observed between HDL and hs-CRP so it can be concluded that the hs-CRP can be an independent risk factor and has added predictive value in determining the risk of cardio vascular diseases.
Key Words: high sensitivity C-reactive protein (hs-CRP), HDL cholesterol.

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INTRODUCTION
Cardiovascular diseases are the leading cause of mortality in both developed and developing countries. Epidemiological data clearly indicate that the risk of cardiovascular disease (CVD) is inversely related to the plasma high-density lipoprotein cholesterol (HDL-C) levels [1]. Low HDL cholesterol is predictive of high CVD risk even in subjects without elevated LDL cholesterol levels[2]. High sensitivity C-reactive protein (hs-CRP) is a non specific inflammatory marker and is synthesized by liver in response to stimulation by pro-inflammatory cytokines derived from several sources including adipocytes [3, 4]. It is seen that hs-CRP is increased in metabolic syndrome, a risk state for the development of cardiovascular disease and type-2 Diabetes mellitus and has been shown to add to the risk conferred by low-density lipoprotein (LDL) cholesterol[5]. Hs-CRP has been proved to be an important and strong predictor of future cardiovascular disease and metabolic abnormalities in overtly seen healthy men and women [6, 7]. Ridker *et al*. examined data from the Physicians' Health Study and observed that measuring CRP added the predictive value

of TC and HDL-C in determining subsequent risk of first Myocardial Infarction (MI) [8]. Even though both CRP and Lipid Profile parameters have a role in initiation and progression of atherosclerosis, no large data is available regarding the correlation between HDL-C and hs-CRP in healthy South Indian population.

METHODOLOGY

This is s retrospective study was carried out at the Cardiac Master Health check-Department of cardiology from analysis of outpatient case records of healthy subjects who visited Chettinad Hospital and Research Institute, Chennai during the period of October 2014 to September 2015. The Study was approved by Institutional Ethical Committee. The entire apparently healthy individuals were selected based on the history, clinical examination, biochemistry reports, electrocardiography findings and echocardiography reports and Tread-mill test. Hs-CRP reports and Lipid Profile parameters were available for all these individuals. The Persons who were known to have Cardio Vascular Disease and having Risk Factors like Hypertension, Diabetes were excluded from the Study. Also patients with chronic inflammatory and infectious disorders were not included in the analysis. The Statistical Analysis Done by SPSS Software, Pierson Correlation was applied for Correlation between hs-CRP and HDL cholesterol and the Correlation coefficient R were calculated.

RESULT

Table 1: Showing Correlations of hs-CRP level with HDL in Healthy Individuals

		hs-CRP level(mg/L)	HDL
hs-CRP level(mg/L)	Pearson Correlation	1	-.089[**]
	Sig. (2-tailed)		.005
	N	990	990
HDL	Pearson Correlation	-.089[**]	1
	Sig. (2-tailed)	.005	
	N	990	990

[**]Correlation is significant at the 0.01 level (2-tailed)

$$y = -1.4788x + 43.154$$
$$R^2 = 0.0061$$
$$R = -0.08$$

1 - <1.0mg/L
2 - 1-3.0mg/L
3 - >3.0mg/L
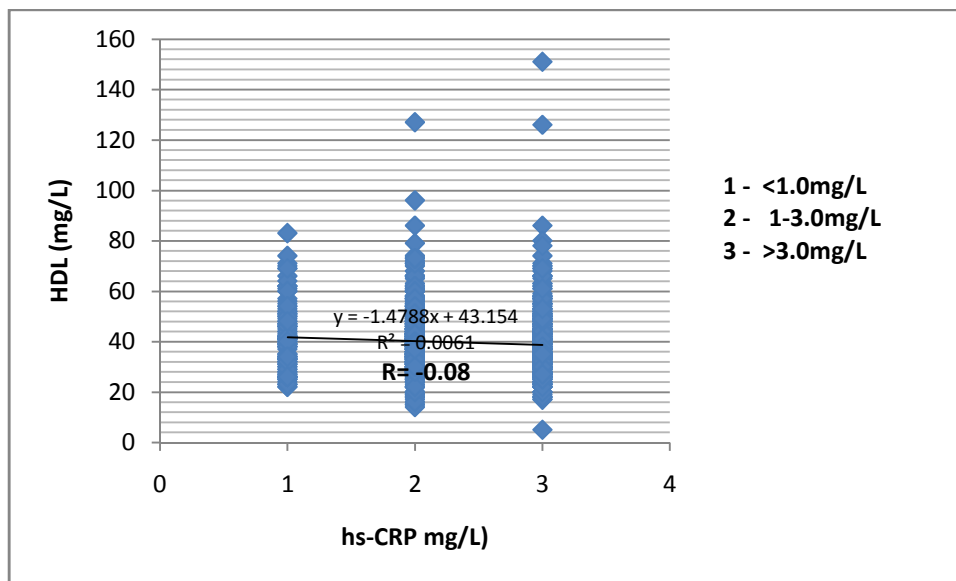
Graph 1: Correlations of hs-CRP level with HDL

From above Table: 1 and Graph: 1 it is Clear that there is negative correlation is seen between HDL and hs-CRP and the Pearson Correlation coefficient R= -0.089and the negative Correlation is statistically Significant (P< 0.01*)

DISCUSSION

Laboratory and experimental evidence indicate that atherosclerosis, in addition to being a disease of lipid accumulation, also represents a chronic inflammatory process.[9] Thus, researchers have hypothesized that inflammatory markers such as high-sensitivity C-reactive protein (HSCRP) may provide an adjunctive method for global assessment of cardiovascular risk.[10, 11] In support of this hypothesis, several large-scale prospective epidemiological studies have shown that plasma levels of HSCRP are a strong independent predictor of risk of future myocardial infarction, stroke, peripheral arterial

disease, and vascular death among individuals without known cardiovascular disease [12,13,,14, 15, 16]. High serum level of high density lipoprotein (HDL) on the other hand is associated with reduced risk for development of atherosclerotic disease. HDL particle are believed to be anti atherogenic and antagonized pathways of inflammation, thrombosis and oxidation[11].

In Our study we have found that there is negative correlation is seen between HDL and hs-CRP and the Pearson Correlation coefficient R= -0.089 and the negative Correlation is Statistically Significant (P< 0.01*) As HDL is protective cholesterol and hs-CRP is negatively correlated mean raised hs-CRP is risk factors for the Cardiovascular diseases, These findings are in concordant with the study by AfreenArshadChoudhry *et al.* where lipid profile parameters were estimated in thirty two patients and found a negative correlation of HDL (p value =0.16) and hs-CRP[18] . These results indicate that there may be a role for HSCRP in screening and risk stratification of atherosclerosis even in patients with high HDL cholesterol levels. Limitations of our study: it is a retrospective study, and other lipid parameters and obesity were not analyzed.

CONCLUSION

We observed a negative correlation is seen between HDL cholesterol and hs-CRP in healthy south Indian population and so it can be concluded that measurement of hs-CRP in addition to HDL may have incremental value in risk stratification for cardio vascular diseases.

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