

Study of Serum Homocysteine Level and C-Reactive Protein Level in Coronary Artery Disease PatientsDaulat Singh Meena¹, Ashish Kumar Agarwal²^{1,2} Department of Cardiology, J L N Medical College, Ajmer, Rajasthan

Received: 10-06-2023 / Revised: 16-07-2023 / Accepted: 09-08-2023

Corresponding author: Dr. Daulat Singh Meena

Conflict of interest: Nil

Abstract:

To assess the difference in serum homocysteine and C-Reactive protein level in coronary artery disease patients and normal controls. This Cross-sectional study was conducted on 200 subjects were studied. This included 100 patients with confirmed CAD and 100 healthy age matched subjects as controls. The blood sample of controls as well as study groups were withdrawn and analysed for serum homocysteine. The serum homocysteine level of CAD patients mean value $62.23 \pm 13.36 \mu\text{mol/l}$ was highly significantly elevated ($p=0.0001$) then control group which had mean value $9.36 \pm 3.02 \mu\text{mol/l}$. This study show that the serum homocysteine level are significantly elevated in CAD patients compare to controls.

Keywords: Coronary artery disease, Homocysteine, Blood sample.

This is an Open Access article that uses a funding model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

The situation of coronary heart disease in India is quite alarming. Reddy [1] reported that mortality from cardiovascular diseases was projected to decline in developed countries from 1970 to 2015 while it was projected to almost double in the developing countries. In the Global Burden of Disease Study it was reported a total of 9.4 million deaths in India in 1990, cardiovascular diseases caused 2.3 million deaths (25%), 1.2 million deaths were due to CHD and 0.5 million deaths due to stroke. It has been predicted that by 2020 there would be 111% increase in cardiovascular deaths in India. This increase is much more than 77% for China, 106% for other Asian Countries and 15% for economically developed countries [2]. The incidence of coronary heart disease in any population is associated with the relative shifts in its biological characteristics-serum lipids, blood pressure, blood glucose, insulin, thrombogenic factors and others. This hypothesis is based on Pickering's observation that sick individuals are just the extreme of a continuous distribution and Key's postulation of sick individuals and sick populations [3]. These shifts are a consequence of changes in lifestyles-smoking,

physical activity, alcohol intake and rich diet as well as psychosocial influences that accompany economic transition [4]. Homocysteine is naturally occurring amino acid derived from metabolism of dietary methionine [5].

Methodology

Type of study- Cross-sectional study

Sample size- The present study was conducted on 200 subjects aged between 35 years to 60 years, comprising of 100 normal control and 100 patients suffering from CAD as study group. The patients with renal disease, liver disease, diabetes mellitus, respiratory failure and those on drugs influencing the homocysteine level were excluded from this study. The blood sample of CAD patients including controls group was taken after fasting for 10-12 hours. 7-10ml of venous blood was drawn from the antecubital vein by aseptic technique in plain vial. Serum was separated from the collected sample for biochemical analysis. The homocysteine was estimated by ELISA.

Result**Table 1. General characteristics**

Variable	CAD Patients	Control	p-value
Mean age	50.23±9.36	51.02±9.06	>0.05
Male : Female	81:19	80:20	>0.05
Homocysteine	63.23±13.36	9.36±3.02	0.01

The serum homocysteine level of CAD patients mean value $62.23 \pm 13.36 \mu\text{mol/l}$ was highly significantly

elevated ($p=0.0001$) than control group which had mean value $9.36\pm 3.02\mu\text{mol/l}$.

Discussion

The present study shows significantly increased serum homocysteine level in CAD patients as compared to control subjects. The mean serum homocysteine level was found to be increased to $35.24\pm 17.80\mu\text{mol/l}$ with a range of 10-14 $\mu\text{mol/l}$ in patients of CAD. The results were in close conformity with the findings of Yadav et al [6] and Tahir et al [7]. The mean serum homocysteine level was observed to be $9.19\pm 3.06\mu\text{mol/l}$ with a range of 5 -15 $\mu\text{mol/l}$ in normal control subjects.

Conclusion

The present studies show that Serum Homocysteine level is significantly elevated in CAD patients as compared to controls. Serum C-RP level in CAD patients is also significantly elevated as compared to controls.

References

1. Reddy K.S. Why is preventive cardiology essential in the Indian context? In : Wasir HS. Editor. Preventive Cardiology: An Introduction. New Delhi. Vikas Publishing. 1991: 1-14.
2. Rodgers A, Lawes C, MacMohan S. Reducing the global burden of blood pressure related cardiovascular disease. *J Hypertens* 2000; 18 (suppl 1): S3-S6.
3. Rose G. Ancel Kyes' Lecture. *Circulation* 1991; 84: 1405-1409.
4. Gupta AK, Bharadwaj A, Ashotra S, Gupta BP. Feasibility of training multipurpose workers in detection, prevention and control of coronary artery disease in apple-belt of Shimla hills. *South Asian J. Prev. Cardiol* 2002; 6: 17-22.
5. Chambers J.C., Wander S.G., Kooner S.J. *Indian heart journal*; 52. No (7) Nov - Dec (suppl) S5-S8, 2000.
6. Aaron R. Folsom. et al.: Association of C-reactive protein with marker of prevalent atherosclerotic disease. *Am. J. Cardio.*; 88, 1 12-117, 2001.
7. Yadav AS., Bhagwat VR., and Rathod IM. Relationship by plasma homocysteine with lipid profile parameters in ischemic heart disease. *I.J.C.B.* 21 (1): 106-110; 2006.
8. Tahir Y., Maral G., Ahmet G., Fulya I and Ednan B.: The serum high sensitive C-reactive protein and homocysteine levels to evaluate the prognosis of acute ischemic stroke dept. of cardiology, Turkey: 145-151, 2007.