Study of Plasma Homocysteine Level in Coronary Heart Disease Patients and Compare with Control

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Abstract: *The study was conducted on 50 patients of coronary heart disease and 50 persons are healthy subjects between the age group 25-70 years of both sex. Homocysteine may increase cellular oxidative stress in which mitochondrial thioredoxin, and peroxidation are decreased and NADH oxidase activity is increased and generating peroxinitrite and nitrotyrosine in contractile protein which causes vascular dysfunction. Plasma homocysteine were measured by hplc grade kit with the help of HPLC. plasma homocysteine level of coronary heart disease patients showed a highly significant (p0.0001) relationship. Estimation of plasma homocysteine is reliable, economic and sensitive and it can be used in the proper management of chronic complications of coronary heart disease.*

Keywords: Coronary heart disease, Homocysteine, HPLC, oxidative stress

1. Introduction

The cardiovascular disease (CVD) burden of India is expected to double in the next two decades, making it the single largest cause of death and the second largest cause of disability by the year 2020[1]

This will be characterized by an enormous burden of CVD among urban communities. Further, the prevalence of CVD in rural and semi-urban areas is expected to increase substantially.[2,3]. Coronary heart disease also known as coronary artery disease or Ischemic heart disease)is the most common form of heart disease and results from atherosclerosis or the accumulation of fatty plaques in artery walls that causes narrowing of artery lumen.[4].

Hyperhomocysteinemia has been strongly associated with the pathogenesis of coronary vascular disease, and correspondingly has been identified as a contributing factor in four main disease mechanisms including thrombosis, vascular oxidative stress, apoptosis and cellular proliferation.[5-7]

2. Material & Methods

The present study was conducted on 50 patients of coronary heart disease of HRMC, Bikaner and 50 persons are healthy subjects between the age group 25-70 years of both sexes.

Determination of plasma homocysteine
For the determination of homocysteine, the sample is reduced and derivatized in one step. The albumin bound and the oxidized homocysteine is reduced. During a precipitation step high molecular substances are removed and analysed by high performance liquid chromatography with uv detector.

3. Results

The plasma homocysteine level was found to be 30.42 ± 10.10µmol/L with a range of 16.04-46.66µmol/L in CHD. The increase was statistically highly significant as compared to control group with 14.95±14.95µmol/L; while it ranged from 6.80 to 21.51µmol/L as evident by P-value (P<0.0001)

Plasma Homocysteine concentration (µmol/L) in CHD subjects with that of control.

S.No	Values	Control group	CHD group
1	Mean	14.955	30.426
2	Range	6.80-21.51	16.04-46.66
3	SD	4.16	10.10
4	SE	0.587	1.428
5	DF		98
6	T		10.014
7	P-value		0.0001***

* Significant
***Highly Significant
Df = Degree of Freedom

4. Discussion & Conclusion

Plasma homocysteine level varied from 6.8 to 18.7µmol/L with mean as 12.92±3.61µmol/l in normal control male subject as shows in the table-X the values of homocysteine obtained in the present series of study in normal control subjects were in close agreement with the findings of coldea et al (2011)[7]

In this study, a highly significant correlation was observed when when plasma homocysteine of CHD subjects was compared with healthy subjects. The increase Plasma homocysteine concentration in CHD patients was statistically significant as compared to normal control more subjects with age difference as evident by P-Value (P<0.001) These values are in close collaboration with the findings of Klerk et al (2002)[8]

Estimation of plasma homocysteine is simple, reliable, economic and sensitive and it can be used in the proper management of chronic complications coronary heart disease.

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