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Comparative study of vitamin B_9 level in CHD patients and normal healthy subjects

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Abstract

Present study was conducted on 50 patient of coronary heart disease patient and 50 persons are healthy subjects between the age group 25-70 years of both sex. Coronary heart disease is the largest killer disease in developed countries and is rapidly assuming a similar role in developing countries. The WHO has drawn attention to the fact that coronary heart disease (CHD) is our modern epidemic, not an unavoidable attribute of aging. It is estimated that if incidence of CHD is brought to zero it would increase the life expectancy by 3 to 9%.[1] Serum vitamin B_9 were measured by hplc grade kit with the help of HPLC. Serum vitamin B_9 of coronary heart disease patients showed a highly significant (p0.0001) relationship. Estimation of serum vitamin B_9 is reliable, economic and sensitive and it can be used in proper management of chronic complications of coronary heart disease.

Keywords: Coronary heart disease, vitamin B_9, HPLC, atherosclerosis

Introduction

Coronary heart disease development and progression is stimulated by environmental and/or genetic factors. The environmental factors include tobacco use, diabetes mellitus and hypertension. Most cases CAD has a multifactorial genetic bases, involving number of genes and environmental factors, which are interacting to determine whether or not the disease will develop as well as its severity.[1]

In CHD the coronary artery that supply blood to the heart is blocked, and in CVA, the arteries that supply blood to the brains are obstructed. The category other vascular disease comprises occlusions of peripheral arteries or veins and congenital, infectious and rheumatoid heart disease. Of all vascular disease, CHD is the most prevalent one.[2]

Blockage of the coronary arteries often begins with atherosclerosis; this is characterized by deposition of cholesterol, cellular waste product, calcium and other substance in the inner layer of connective fibrous tissue. This is called an atherosclerotic plaque. If plaque grows to a great extent they significantly reduce or obstruct the blood flow through artery. They can also become fragile and rupture, which induces the formation of blood clot (thrombosis).These clots may be locally

block the blood flow or break off and travel to other parts of the body where they may occlude other arteries or veins.[3]

Folic acid and folate (the anion form) are a water soluble B-vitamins. The function of folate is to carry and transfer active carbon units for the novo synthesis of purines and pyrimidines required for DNA and RNA synthesis, e.g. to maintain normal haematopoiesis. Folate is required for the remethylation of Hcy to methionine.

Materials and methods

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

Determination of Serum vitamin B_9

Detection was performed with a photodiode array detector monitoring the eluent 280 nm for folic acid. Identification of resolved peaks in real samples was executed by comparing their spectra with those derived from aqueous standard solutions.For the determination of vitamin B_9 the sample is reduced and derivatized in one step. HPLC injection the values of different parameter in different subjects were obtained with the help of uv detector.

Results

The serum folic acid (vit. B_9) level was found to be 3.64 ± 1.23 ng/ml) with a lange of 1.25 to 6.72 ng/ml in CHD subjects .The decrease level of folic acid (vit. B_9) was statistically highly significant as compared to control subjects with 4.90 ±1.94ng/ml; while it ranged from 1.86-9.12 ng/ml as evident by P-Value (P<0.0002) The results of present study of folic acid (vit. B_9) was similar to results obtained by previous studies.

Serum Vitamin B_9 (Folic acid) concentration (ng/ml) in CHD subjects with that of control.

Sr. No.	Values	Control group	CHD group
1	Mean	4.90	3.64
2	Range	1.86-9.12	1.25-6.72
3	SD	1.94	1.23
4	SE	0.27	0.175
5	DF		98
6	t		3.868
7	P-value		0.0002***

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

Discussion and conclusion

The serum vitamin B_9 (Folic acid) concentration was found to be decreased significantly in CHD patients aged between 25-45 years as well as in the whole group as compared to the normal control subjects with same age difference. Deficiency of folic acid increase the risk for CHD folic acid acts to prevent for the formation of atherosclerosis by four mechanisms. It is supposed that high concentration can reduce super oxide and reduce oxidative damage to human LDL. The results of present study of serum B9concentration was similar to results obtained by previous studies reported by Arnow WS et al(1992), Pancharuiti N et al (1994) ,Selhub J et al (1995), Nygardo et al (1998), Bailey LB et al(1999),[4-11]

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