

## **Research Article**

### **Study of Vitamin B<sub>12</sub> level in Coronary heart disease (CHD) Patients and Compare with Normal Healthy Subjects**

**Sharma Hemlata<sup>\*1</sup>, Vyas Shalini<sup>2</sup>, Dr. Vyas R.K.<sup>3</sup>, Dr. Chhapparwal Amit<sup>4</sup>, Chawla kim<sup>5</sup>, Dr. Gora Meenakshy<sup>6</sup>**

<sup>1,2</sup>M.Sc.(medicine) Biochemistry, Biochemist, Department of Biochemistry, S.P. Medical College, Bikaner.

<sup>3</sup>PhD Biochemistry, professor & head, Department of Biochemistry, .S.P. Medical College, Bikaner.

<sup>4</sup>M.D.S., Assistant Professor, Geetanjali dental research institute, Geetanjali medical College, Udaipur.

<sup>5</sup>M.Sc.(medicine) Biochemistry, Senior demonstrator, Department of Biochemistry, S.P. Medical College, Bikaner.

<sup>6</sup>M.D.Biochemistry, Assistant Professor, Department of Biochemistry, . S.P. Medical College, Bikaner

#### **\*Corresponding author**

Hemlata Sharma

**E mail:** [hemlatas212@gmail.com](mailto:hemlatas212@gmail.com)

---

**Abstract:** This study was conducted on 50 patient of coronary heart disease and 50 persons are healthy subjects between the age group 25-70 years of both sex. Coronary heart disease develops through narrowing of the coronary arteries which leads to death of portion of the heart muscle because of blood flow that oxygen nutrition supply, and leads to Heart attack. 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%. Serum vitamin B<sub>12</sub> were measured by HPLC grade kit with the help of HPLC. Serum vitamin B<sub>12</sub> of coronary heart disease patients showed a highly significant (p<0.0001) relationship. Estimation of serum vitamin B<sub>12</sub> 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<sub>12</sub>, HPLC, atherosclerosis

---

#### **INTRODUCTION**

Coronary heart disease has been defined as Impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart [1]. Complete occlusion of coronary artery may be produced in a variety of ways:

1. Atherosclerotic narrowing of the vessel with complete obstruction of the lumen.
2. Thrombosis in an already atheromatous artery.
3. Hemorrhage into an atheromatous plaque.
4. Rupture of such a plaque into the lumen.

Patients of Ischemic heart disease are known to have hypercoagulability of the blood. Raw causes are syphilitic aortic sealing the mouth of the coronary artery and an embolus from a vegetation on the aortic valve. Atherosclerosis is more common in coronaries than other vessels of similar size. With every systole and diastole there is a change in length of coronaries. To meet this stress we find intimal supports of longitudinal muscle lying in matrix of connective tissue. These supports are more developed in males than in females, and, they are site of lipid accumulation and they have been blamed for bad name, which coronary arteries enjoy.

Vitamin B<sub>12</sub> was inversely correlated with inflammatory markers (high-sensitivity C-reactive protein and interleukin-6) directly related to insulin resistance [2]. Vitamin B<sub>12</sub> deficiency may cause neurological symptoms such as, impaired vibration sense, neuropsychiatric disturbances including depression, confusion and cognitive impairment, even in the absence of anaemia (Symptoms in the elderly are more often non-specific like tiredness or malaise[3]).

#### **MATERIAL & 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<sub>12</sub>**

Detection was performed with a photodiode array detector monitoring the eluent 230 nm for vitamin B<sub>12</sub>. 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<sub>12</sub> 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 cobalamine (vit. B<sub>12</sub>) concentration was found to be 214.52 ± 127.21 pg/ml with a range of

83.84 to 369.00 pg/ml in CHD subjects. The decreased level of vit. B<sub>12</sub> was statistically significant as compared to control subjects with 276.12 ± 121.92 pg/ml; while it ranged from 136.25-468.00 pg/ml as it evident by P-value.

**Table-1: Serum Vitamin B<sub>12</sub> concentration (pg/ml) in CHD subjects with that of control.**

S. No	Values	Control group	CHD group
1	Mean	276.12	214.52
2	Range	136.25 - 468.00	83.84 - 369.00
3	SD	121.92	127.21
4	SE	17.24	17.99
5	DF		98
6	t		2.472
7	P-value		0.015*

\* Significant  
Df = Degree of Freedom

**DISCUSSION AND CONCLUSION**

The values of vit. B<sub>12</sub> are in close to resembled with findings of Friso *et al* [4]. The statistically significant decreased in serum vit. B<sub>12</sub> level in CHD patients might be due to that higher blood homocystine level appear to be associated with higher risk of coronary cerebral and peripheral vascular disease are inversely related to blood levels of folate and of vit.B<sub>12</sub> and vit. B<sub>6</sub>. Vitamin B<sub>12</sub> would be expected to reduce homocysteine levels and reduces the risk of vascular disease reported by Ishihara *et al* [5].

The values of serum vit. B<sub>12</sub> obtained in the present series of study in CHD patients were in close agreement with the findings of Gopinath *et al*[6].

**REFERENCES**

1. WHO; Technical Report Series, No.678, WH01982.
2. Mahalle N, Kulkarni MV, Garg MK, Naik SS; Vitamin B12 deficiency and hyperhomocysteinemia ascorrelates of cardiovascular risk factors in Indian subjects with coronary artery disease. J Cardiol, 2013; 61(4):289-94.
3. Lindenbaum J, Healton EB, Savage DG, Brust JC, Garrett TJ, Podell ER *et al*; Neuropsychiatric disorders caused by cobalamin deficiency in the absence of anemia or macrocytosis. N Engl J Med, 1988; 318(26): 1720-8.
4. Friso S, Jacques PF, Wilson PW, Rosenberg IH, Selhub J; Low circulating vitamin B6 is associated with elevation of the inflammation marker C-reactive protein independently of plasma homocysteine levels. Circulation, 2001; 103(23):2788-2791.
5. Ishihara J, Iso H, Inoue M, Iwasaki M, Okada K, Kita Y, Tsugane S *et al*; Intake of folate, vitamin B6 and vitamin B12 and the risk of CHD: the Japan Public Health Center-Based Prospective Study Cohort I. Journal of the American College of Nutrition, 2008; 27(1):127-136.
6. Gopinath B, Flood VM, Rohtchina E, Thiagalingam A, Mitchell P; Serum homocysteine and folate but not vitamin B12 are predictors of CHD mortality in older adults. European journal of preventive cardiology, 2012; 19(6):1420-1429.