

Assessment of Plasma Vitamin B₁₂ and Folic Acid During Postmenopausal Period

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Abstract

Objective: With increasing age and hormonal changes in life of women there is change in levels of micronutrients like vitamin B₁₂ and folic acid. Very little data is available on the association between the basal levels of micronutrients such as VitB₁₂, folic acid in pre and post menopausal women. Presence of an association will throw light on the role of micronutrients in prevention of CVS diseases in menopausal women. This would reinforce the role of micronutrients as a cheap viable option in the prevention of CVD in menopausal women.

Method: Plasma vitamin B₁₂ and folic acid level were measured by radioimmunoassay in 60 pre and postmenopausal women.

Results: Vitamin B₁₂ and folic acid concentrations were statistically significantly lower in postmenopausal group when compared to premenopausal group. (p value <0.005)

Conclusion: This study has provided baseline levels of folic acid and vitamin B₁₂ with their association with menopause. This may be helpful for planning supplementation studies of the micronutrients.

Keywords: Vitamin B₁₂, folic acid, Homocysteine, Menopause.

Introduction

With increasing life expectancy a woman spends almost 1/3rd of her life in menopause. Cardiovascular diseases (CVD) which becomes an important cause of mortality in women worldwide. Framingham studies have demonstrated a fourfold increase in the incidence of cardio vascular diseases (CVD) in post menopausal (PM) period.¹

It has been shown that premenopausal women are protected from CVD by estrogen having a favorable effect on plasma homocysteine levels thus protecting the vascular endothelium from damaging effects of

oxidizing free radicals. After menopause this protection is lost due to estrogen deficiency.

Hormone replacement therapy (HRT) was the focus of medical research for the last 10-15 years. Initially it was observed that it protects postmenopausal women from CVD but now it has been proved that it can significantly increase the risk for heart attack, strokes and breast cancer. It is therefore not justified in exposing patient to so many serious diseases just to protect them from CVD.

Various studies show that supplementation of folic acid and VitB₁₂ decreases Homocysteine levels.²⁻⁴

Very little data is available on the association between the basal levels of micronutrients such as VitB₁₂, folic acid in pre and post menopausal women. Presence of an association will throw light on the role of micronutrients in prevention of CVS diseases in menopausal women. This would reinforce the role of micronutrients as a cheap viable option in the prevention of CVD in menopausal women.

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So the purpose of the study is to determine the levels of micronutrients like Vit. B12 folic acid, during postmenopausal period.

Material & Method

This was a cross sectional study. Subjects were recruited from Bharati Hospital, Pune. 60 women volunteers between 35-60 years were included in the study. They were divided into 2 groups of pre (Group I) & post menopause (Group II). Subjects were classified as premenopausal if they had regular menstrual periods & who had menstrual periods once in 2 months or 3 months & postmenopausal if absence of menstrual periods for 12 consecutive months and thereafter irrespective of surgical or natural menopause⁵. Socioeconomic status, physical activity and dietary history using food frequency questionnaire was included as life style factors. Patients with known history of diabetes, hypertension, and ischemic heart disease, history of known disease (including cardiovascular disease, thyroid disease, hypertension or any other acute and chronic disease condition) or Cancer, taking treatment of anaemia were excluded from the study.

Sample collection: 2-ml of Fasting venous blood sample was taken in the morning. The plasma was separated and frozen at -80°C for later analysis. Plasma folate and vitamin B₁₂ concentrations were measured by radioimmunoassay. The study was conducted only after seeking approval from the Ethical Committee. Data was expressed as mean ± SD. Results with a p value of less than 0.05 will be considered significant. The data will be analyzed using SPSS/PC+ package (Version 11.0, Chicago IL).

Result

Table 1: Comparison of Vitamin B₁₂ in study groups

Groups N= 60	Vit B ₁₂ (pg/mL)		P Value
	Mean	SD	
Group I	331.39	109.18	<0.0001
Group II	256.06	104.23	

Table 1 shows vitamin B12 concentrations are significantly lower in postmenopausal women as compared to premenopausal women.

Table 2: Comparison of folic acid in study groups

Groups N = 60	Folic acid (ng/mL)		P Value
	Mean	SD	
Group I	12.15	5.02	<0.005
Group II	10.87	5.14	

Table 2 shows folic acid concentrations are significantly lower in postmenopausal women as compared to premenopausal women.

Discussion

Vitamin B₁₂ and folic acid concentrations were significantly lower in postmenopausal group when compared to premenopausal group as shown in table 1 and 2.

Güven et al⁶ observed that the risk of cardiovascular disease is higher in patients with metabolic syndrome & high homocysteine levels in both middle aged males and females. Folic acid, vitamin B12 play imp role in maintaining the homocysteine levels.⁷ Various studies found the association of folic acid & vit B₁₂ levels with Homocysteine. But Cui R et al⁷ in 2010 no association was found between vit B₁₂ intake and cardio vascular mortality risk. In a study by Aytekin Güven et al⁶ it was found that a high serum total homocysteine (tHcy) level is an independent risk factor for cardiovascular disease in patients of metabolic syndrome with median age 35 (26-48) years. Total homocysteine levels were significantly higher in metabolic syndrome group than in the control group (24.2µmol/l vs. 13.4µmol/l). Vitamin B₁₂ levels were significantly lower in metabolic syndrome group than in the control group

In one study it was found that based on cut-off values, altered concentrations of homocysteine, folic acid, and vitamins B₁₂ were found in 20%, 6%, 11%, and 67% of participants, respectively.⁸

Age was positively correlated with homocysteine plasma concentrations (p < 0.001). Multiple linear regression models accounted for 10.2%, 5.8%, 14.4%, and 9.4% of folic acid, vitamins B₁₂ and homocysteine plasma or serum concentrations, respectively. In a study by CS Yajnik et al⁹ in 2007 found that, twenty-six women had low vitamin B₁₂ status (<150 pmol/L) and 24 had hyperhomocysteinemia. (>15 µmol/L) Plasma vitamin B₁₂ concentration decreased and plasma tHcy increased with increasing age (p< 0.01 and p<0.05 respectively).

In a study Seema Bhargava et al,¹⁰ Homocysteine concentrations were significantly lower in CVD patient as compared to controls. However, only folic acid levels were significantly lower in patients of CVD than in controls. The levels of both vitamin B₁₂ and folic acid were within the biological reference Interval in controls as well as patients.

Cui R et al⁷ studied that association of dietary folate and vitamin B₁₂ intakes with risk of cardiovascular disease in Asian populations aged between 40 to 79 years. Dietary folate intake was inversely associated with mortality from heart failure for men and with mortality from stroke, coronary heart disease, and total cardiovascular disease for women. No association was found between vitamin B₁₂ intake and mortality risk.

Conclusion

It was observed that vitamin B₁₂ and folic acid concentrations were significantly lower in postmenopausal group when compared to premenopausal group. This study has provided baseline levels of folic acid and vitamin B₁₂ with their association with menopause. This may be helpful for planning supplementation studies of the same.

Source of Funding: The project was funded by Bharati Vidyapeeth (Deemed to be University) Medical College, Pune.

Conflict of Interest: Nil

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