

SERUM LEVEL OF VITAMINS AND RELATIONSHIP WITH DIETARY INTAKES IN WOMEN WITH GESTATIONAL DIABETES MELLITUS

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BACKGROUND: Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy. The prevalence may range from 1 to 14% of pregnancies, depending on the population studied (1). In women with GDM, medical nutrition therapy (MNT) is the primary intervention strategy for managing blood glucose. The American Diabetes Association recommends that all women with GDM receive nutrition counseling by a dietitian when possible. Individualization of MNT depending on maternal weight and height, physical activity level, and lifestyle is recommended. The goal of nutrition therapy is to provide recommended nutrient and adequate energy levels for appropriate gestational weight gain and the achievement and maintenance of normoglycemia with the absence of urinary ketones. This is achieved by encouraging the consumption of healthful foods (2).

Pregnancy is associated with physiologic changes that result in increased plasma volume and red blood cells and decreased concentrations of some vitamins and minerals (3-6).

AIMS: To measure vitamin levels in serum (folic acid, vitamin A, E, B₁₂ and β -carotene) and to evaluate relation between serum levels and dietary intakes of the vitamins in women with gestational diabetes mellitus.

METHODS: Serum levels of folic acid, vitamin A, E, B₁₂ and β -carotene were measured and dietary intakes (3 day-food record) of the vitamins were calculated in 7 gestational diabetic woman between 25-28 weeks of gestation, aged 25-35 years (mean 30.9 \pm 3.8 years), attended to Zekai Tahir Burak Women Hospital. Women who had taken oral vitamin and mineral supplements were excluded. Serum folic acid and vitamin B₁₂ levels were measured with microparticle enzyme immune method, serum vitamin A, E and β carotene levels were performed by using spectrophotometric method. Statistical analysis was performed by using the program SPSS 11.5 for Windows. Results are given as mean \pm S.D. Pearson and Spearman

correlation coefficients were used for normally and non-normally distributed data respectively.

RESULTS: Serum folic acid (mean 8.54 \pm 1.93 ng/ml), vitamin A (mean 42.81 \pm 8.36 μ g/dl), vitamin E (mean 1.10 \pm 0.21 mg/dl) levels were between normal range. One woman had high level than normal range of β -carotene (2.90 μ g/ml) and just one had less than normal range of vitamin B₁₂ (132 pg/ml) (Table 1).

Table 1. Serum vitamin levels in gestational diabetic women at time of diagnosis

Subject	Week of gestation	Folic acid (ng/ml)	Vitamin B ₁₂ (pg/ml)	Vitamin A (μ g/dl)	β -carotene (μ g/ml)	Vitamin E (mg/dl)
1	28	6.17	240	35.40	1.50	1.41
2	25	8.76	226	43.07	2.14	0.95
3	26	8.39	132	53.20	1.48	1.23
4	27	6.86	176	37.30	2.15	1.05
5	25	12.00	176	38.80	2.90	0.80
6	28	9.73	184	36.20	1.25	0.99
7	25	7.84	180	55.70	1.49	1.27
\bar{X}	26.29	8.54	187.71	42.81	1.84	1.10

A significant positive correlation ($r=0.916$) was found between dietary intake and serum level of β carotene ($p<0.01$). There was a positive correlation between dietary intake and serum level of folic acid ($r=0.572$), as well as dietary intake and serum level of vitamin B₁₂ ($r=0.544$) but these relationships were not statistically significant ($p>0.05$) (Table 2).

Table 2. The relationship serum vitamin levels and dietary intakes in gestational diabetic women

Variables	n	r	P
Dietary folic acid intake- serum level	7	0.572	0.179
Dietary vitamin B ₁₂ intake- serum level	7	0.544	0.207
Dietary vitamin A intake- serum level	7	-0.367	0.418
Dietary β carotene intake- serum level	7	0.916	0.004*
Dietary vitamin E intake- serum level	7	0.255	0.581

* $p<0.01$

CONCLUSION: There are no published reports concerning in maternal vitamin status and dietary intake in gestational diabetic women. The main limitation of this study was that dietary intake and serum levels of vitamins were obtained from only small amount of gestational diabetic women.

All women with GDM should receive nutritional counseling, by a registered. Individualization of medical nutrition therapy (MNT) depending on maternal weight and height is recommended. MNT should include the provision of adequate calories and vitamins and minerals to meet the needs of pregnancy.

In conclusion our findings showed that confirmation is needed by larger studies with assessments of dietary intake of foods rich in folic acid, vitamin A, E, B₁₂ and β -carotene, as well as serial measurements of maternal blood vitamin concentrations.

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