

Dietary intake in immigrant Arabian pregnant women

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ABSTRACT

Objectives: We examined the intake of dietary micronutrients of immigrant Arabian pregnant women in Greece, in order to investigate the possible factors influencing food intake and affecting the overall nutritional profile.

Methods: A dietary assessment of 497 immigrant Arabian pregnant women, admitted to the Obstetrics and Gynecology Department, Outpatient Clinic, Tzaneion General Hospital, Piraeus city, Vyronas Health Center, and Alexandras General Hospital, Athens, Greece was performed between August 2002 and August 2005, along with a comparison of micronutrient intake with the latest dietary recommendations. We carried out blood analysis, and measurements of serum micronutrients in all participants.

Results: Four hundred and sixty-seven out of 497 (94%) women followed the traditional Arabian diet, and did not

use drug medication or supplements during gestation. The mean dietary intakes of vitamin E, vitamin B12, vitamin C, zinc, calcium and phosphorus in the 2nd and 3rd trimesters were similar to the respective values of the Dietary Reference Intake, while the mean dietary intake of vitamin D was relatively low. The mean intakes of folic acid and iron were lower than the respective values, while the mean intakes of vitamin A and magnesium was slightly higher. The results of the laboratory tests were normal in 470 women (94.5%) except those regarding iron deficiency anemia, which was relatively common.

Conclusion: Our findings suggest that apart from iron and folic acid supplementation, no further changes would be necessary in the dietary patterns of immigrant Arabian pregnant women, since their traditional nutritional habits seem to provide all micronutrients in sufficient quantities.

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Diet plays a determining role in the normal outcome of pregnancy. The satisfactory intake of dietary micronutrients is shown to reduce the risk of an abnormal gestation, which could be easily achieved by regular diet or medical supplementation. Pre-pregnancy body mass index (BMI) and gestational weight gain both have strong, positive effects on fetal

growth,¹⁻³ but little if any impact on the duration of gestation.²⁻⁴

The aim of the current study was to record the total intake of micronutrients of the immigrant Arabian pregnant women living in Greece, and investigate the possible impact of the ethnic and religious nutritional attitudes, socioeconomic status, or other

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factors influencing food intake, and affecting the overall nutritional profile. The nutritional sufficiency was evaluated in relation to the latest dietary recommendations or Dietary Reference Intakes (DRI) for the population of pregnant women.⁵

Methods. The study included 497 immigrant Arabian pregnant women, randomly selected between August 2002 and August 2005, after being admitted to the Obstetrics and Gynecology Department, Outpatient Clinic, Tzaneion General Hospital, Piraeus city, Vyronas Health Center, and Alexandras General Hospital, Athens, Greece. Women with serious complications during their gestational period, as well as women who followed special types of diet such as patients with diabetes mellitus and vegetarians were excluded. A dietary assessment of the participants was performed, along with a comparison of their micronutrient elements intake with the latest dietary recommendations. The maternal nutritional status of these women, as well as the clinical status and the intention to breast-feed were evaluated. The term maternal nutrition, we included several anthropometric factors such as pre-pregnancy weight-for-height (such as BMI and gestational weight gain (which partly reflects the balance between energy intake and energy expenditure), but also includes increases in body water), as well as intake of protein and micronutrients (vitamins and minerals). The nutritional questionnaire for pregnant women of the California Department of Health Services,⁶ and the questionnaire on the frequency of food consumption of Willet,⁷ (with some modifications that concern the adjustment of the questionnaire to the facts of the Arabian dietary habits) were used for the dietary assessment. Routine blood analyses, and measurements of micronutrients (serum measurement of calcium, magnesium, phosphorus, ferrum, folic acid, vitamin B12) were performed in all participants, as part of the standard maternal care and pregnancy follow-up, as performed by the obstetrician. The analysis of dietary intake of micronutrients resulting from food consumption, was performed using the Diet Analysis Plus software, version 3, while the statistical analysis was performed using the Minitab for Windows, Release 12 software program.

Results. Most of the pregnant women (90%) were in the age group of 19 - 35 years old. Two hundred and eighty-three (57%) of the pregnant women were nulliparous, 224 (45%) had a previous labor, 75 (15%) had 2 previous labors and 45 (9%) had 3 previous labors. One hundred and ninety-eight out of the 497 were in their 2nd trimester of gestation

and 241 were in their 3rd trimester of gestation. Of these women 90% planned their diet on their own, 64% bought their food supplies by themselves, and 95% prepared their meals on their own. Most of the women (74%) were not consulting a physician on a regular basis since conception; while almost all of the nulliparous women (95%), were visiting the doctor for the first time, 98% of the pregnant women followed the traditional Arabian diet. Only 10% of these women received medication, while only 14% received nutritional supplement (iron, folate or calcium or both).

Daily water intake was 5.88 glasses of water on a mean average (as measured in 250 ml glasses and reported by the participants). Iron deficiency anemia (IDA) was diagnosed in 32% of pregnant women, while disorders of the thyroid function in 4% and hypertension in 5%. Furthermore, 52% of pregnant women suffered with nausea, 37% with vomiting and 15% reported cramps. The mean body weight of these women before pregnancy was 62.15 kg, while the mean body weight gain in their 2nd trimester of gestation was 5.03 kg, whereas those who were in their 3rd trimester of gestation were 11.15 kg. The majority, 467 of 497 (94%) of the immigrant Arabian pregnant women followed the traditional Arabian diet and did not use drug medication or supplements during gestation. The mean dietary intakes of vitamin E and zinc, vitamin B12, vitamin C, calcium and phosphorus in immigrant Arabian pregnant in the 2nd and 3rd trimester were similar to the respective values of the DRIs, while the mean dietary intakes of vitamin D were relatively low (**Table 1**). On the

Table 1- Daily rounded mean nutritional intakes of Arabian pregnant women as calculated according to questionnaire data.

Examined variables	Values
Energy (kcal)	2219
Carbohydrate (g)	312
Fat (g)	75
Protein (g)	74
% kcal from carbohydrate	56
% kcal from fat	30
% kcal from protein	13
Vitamin C (mg)	135
Vitamin A (IU)	3100
Vitamin D (IU)	454
Vitamin E (mg)	32
Vitamin B12 (mcg)	4
Folate (mg)	198
Iron (mg)	13
Zinc (mg)	19
Magnesium (mg)	550
Calcium (mg)	1432
Phosphorus (mg)	1260

contrary, the mean intakes of folic acid and iron, was lower from the respective values of the DRIs while the mean intakes of vitamin A, and magnesium were slightly higher to the respective values of the DRIs. The results of the laboratory tests, and blood serum biochemical analyses, showed that 470 of the pregnant women tested (94.5%) had no abnormal levels of all parameters tested. The only pathologic result regarded IDA, which was common, and diagnosed by a Ferritin level <12 ng/ml and Hb <12 g/dl.

Discussion. Gestation represents a period of increased metabolic demands, and nutritional sufficiency is very important not only for the outcome of pregnancy, but also for the development of the fetus and the preservation of the pregnant reserves.^{8,9} There is a clear evidence to support the importance of optimal nutritional status in the prevention of both broad subgroups of low birth weight: small-for-gestational-age births (which result from intrauterine growth retardation) and prematurity (which accounts for most low-birth weight births in developed countries).¹⁰⁻¹⁴ Several authors suggested that differences in micronutrients intakes between study populations are possibly due to different dietary habits.¹⁵ Our findings show that immigrant Arabian pregnant women actually cover by far their daily needs in vitamin A, vitamin B12, vitamin C, vitamin E, Zinc, magnesium, calcium, phosphorus since they consume sufficient quantities of dairy products, meat, fruits and vegetables. Such findings were largely confirmed by the normal results of the biochemical laboratory serum blood tests performed. The mean dietary intake of vitamin D, while not high, was sufficient probably due to the higher sun exposure of these women in Greece when compared to Arabian women living in Saudi Arabia.¹⁶ It is also worth noticing, that they consume by average, approximately 6 glasses of water each day, a quantity, slightly lower than that of the recommended amount of 8-10 glasses of water per day. Although the incidence of IDA in our study population was similar to that of other studies,^{17,18} iron and folic acid daily intake (as well as iron, folic acid and ferritin serum levels) were low, which suggests that immigrant Arabian pregnant women should receive supplements of iron and folic acid.

In conclusion, it seems that the majority of immigrant Arabian pregnant women living in the southeastern Mediterranean basin (Greece), does not consider necessary the participation of a dietitian or a physician's intervention during the time period of pregnancy, as they believe that the traditional Arabian dietary pattern is satisfactory for the normal outcome of their pregnancy. Similarly, our findings suggest

that apart from iron and folic acid supplementation, no further particular changes would be necessary in the dietary patterns of immigrant Arabian pregnant women, since their traditional nutritional habits seem to provide all micronutrients in sufficient quantities.

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