

HEMATOLOGICAL AND BIOCHEMICAL PROFILES, ANTHROPOMETRIC PARAMETERS, NUTRITIONAL STATUS DURING PREGNANCY AND EFFECTS ON NEWBORN

EDA KÖKSAL*, GÜLDEN PEKCAN*, SELİME AYAZ**

*Hacettepe University, Department of Nutrition and Dietetics, Ankara, Turkey

**Turkish High Speciality Teaching and Research Hospital, Laboratory of Hematology, Ankara, Turkey

ABSTRACT

Background: Pregnancy is a period of rapid growth and cell differentiation, both for the mother and the fetus. Consequently, it is a period when both are very susceptible to alterations in dietary supply, especially of nutrients which are marginal under normal circumstances. **Aims:** The aim of the study was to determine the hematological and biochemical profiles, anthropometric parameters and the nutritional status of pregnant women and also to find out the effects on the newborn. **Methods:** A prospective study was carried in Outpatient Clinic of Afyon Zübeyde Hanım Women and Child Hospital. A total of 111 pregnant women, in the second trimester of pregnancy, aged 18- 35 ($\bar{x}\pm Sx$: 24.1 \pm 0.44) years, volunteered, healthy and not using any supplement other than iron were assigned in the study. A questionnaire was completed for recording medical and socio-demographic characteristics, food intakes for three consecutive days and food frequency, hematological and biochemical data were collected for pregnant women. Anthropometric measurements and feeding practices of newborns were followed for three months. **Results:** Dietary intakes of folate and iron of women, below the 67% of recommended dietary allowance (RDA) were 100.0% and 50.4% respectively. Prevalence of iron deficiency (serum ferritin <15mcg/L) and iron deficiency anemia (serum ferritin <15mcg/L and Hgb concentration <12g/dL) among women were 76.6% and 58.6 %, respectively. While, 67.5 % of pregnant women had vitamin B₁₂ levels below recommended levels (serum vitamin B₁₂ <100pg/mL), 92.8 % had normal folic acid levels (serum folic acid <3ng/ml). Significantly poor positive correlations were found between birth weight of newborns and maternal serum hemoglobin, hematocrit and MCV levels ($r = 0.35, 0.32, 0.23, p<0.05$, respectively). Positive correlation was determined between birth weight of the newborn and maternal serum folic acid level ($r = 0.30, p< 0.05$). **Conclusion:** Healthy nutrition is important for the health of women and for the health, survival, growth and development of their children. This approach involves programmes aimed to prevent, improve and promote public health, such as fortification of foods, supplementation, nutrition education on healthy nutrition, increasing awareness on nutrition.

INTRODUCTION

Dietary recommendations for women before and during pregnancy are, in fact, very similar to those for other children-bearing aged women but with a few exceptions. The main recommendation is to eat a healthy, balanced diet as described in the *Balance of Good Health* model. However, there are some specific recommendations which apply to pregnancy⁽¹⁾.

It is now recognized that pregnant women do not actually have to 'eat for two'; however, a healthy and varied diet, rich in nutrients, is important for both the mother and the baby. The developing fetus obtains all of its nutrients through the placenta, so dietary intake has to meet the needs of the mother as well as the products of conception, and enable the mother to lay down stores of nutrients required for the development of the fetus and lactation after the birth⁽¹⁻³⁾.

The rate of iron deficiency anemia in Turkey's women is estimated at just over 30-50%⁽⁴⁻⁵⁾. The deaths of an estimated 100 young Turkish women every year in pregnancy and childbirth. And approximately 5,000 Turkish infants a year at increased risk of death in the period immediately before or after birth because of the severe iron deficiency anemia. Cause of the folate deficiency approximately 3,000 severe birth defects annually, including infantile paralysis, in Turkey⁽⁴⁾.

OBJECTIVES

The aim of the study was to determine the hematological and biochemical profiles, anthropometric parameters and the nutritional status of pregnant women and also to find out the effects on the newborn.

METHODS

A prospective study was carried in Outpatient Clinic of Afyon Zübeyde Hanım Women and Child Hospital. A total of 111 pregnant women, in the second trimester of pregnancy, aged 18- 35 ($\bar{x}\pm Sx$: 24.1 \pm 0.44) years, volunteered, healthy and not using any supplement other than iron were assigned in the study. A questionnaire was completed for recording medical and socio-demographic characteristics, food intakes for three consecutive days and food frequency, hematological and biochemical data were collected for pregnant women. Anthropometric measurements and feeding practices of newborns were assessed for three months.

RESULTS

Mean (\pm SEM) of dietary energy and other nutrients intakes of pregnant women were given in Table 1. Mean of energy, protein, iron, calcium, folate and vitamin B₁₂ intakes were determined 2260 \pm 49.1 kkal, 74.8 \pm 2.28 g, 12.4 \pm 0.85 mg, 706.1 \pm 23.17 mg, 216 \pm 26.30 mcg, 1.8 \pm 0.21 mcg, respectively.

Dietary intakes of folic acid and iron of women, below the 67% of recommended dietary allowance (RDA) were 100.0% and 50.4% respectively. No correlation was observed between women's hematological-biochemical profiles and energy and nutrients intakes ($p>0.05$).

Table 1: Mean of dietary energy and other nutrients intakes of pregnant women

Energy and nutrients	x	SD	SEM	Range	RDA	RDA % x
Energy (kkal)	2260	517.6	49.1	1485-3798	2500	104.6
Protein (g)	74.8	24.07	2.28	31.1-151.7	60	154.3
Calcium (mg)	706.1	214.01	23.17	210.1-1354.7	1200	64.5
Iron (mg)	12.4	8.95	0.85	6.1-20.2	30	45.8
Folate (mcg)	216.0	48.61	26.30	72-356	400	56.3
Vitamin B ₁₂ (mcg)	1.8	1.46	0.21	0.57-6.05	2.2	152.4

Prevalence of iron deficiency and iron deficiency anemia among women were 76.6% and 58.6 %, respectively. While, 67.5 % of pregnant women had vitamin B₁₂ deficiency, 92.8 % had normal folic acid levels (Table 2).

Table 2: Distribution of the pregnant women's nutritional anemia criteria

Parameters	Normal		Deficiency	
	n	%	n	%
Iron deficiency	26	23.4	Serum ferritin <15mcg/L	
			85	76.6
Iron deficiency anemia	46	41.4	Serum ferritin <15mcg/L and Hgb <12g/dL	
			65	58.6
Vitamin B ₁₂	36	32.5	Serum vitamin B ₁₂ <100pg/mL	
			75	67.5
Folic acid	103	92.8	Serum folic acid <3ng/mL	
			8	7.2

Low birth weight (<2500g) was determined only 4.5 % of newborn and their mean of serum folic acid level was 4.7 ng/L . Significantly poor positive correlations were found between birth weight of newborns and maternal serum hemoglobin, hematocrit and MCV levels ($r = 0.35, 0.32, 0.23, p<0.05$, respectively). Positive correlation was determined between birth weight of the newborn and maternal serum folic acid level ($r = 0.30, p< 0.05$).

CONCLUSION

A healthy and varied diet is important at all times in life, but particularly so during pregnancy. The maternal diet must provide sufficient energy and nutrients to meet the mother's usual requirements, as well as the needs of the growing fetus, and enable the mother to lay down stores of nutrients required for fetal development as well as for lactation.

This approach involves programmes aimed to prevent, improve and promote public health, such as fortification of foods, supplementation, nutrition education on healthy nutrition, increasing awareness on nutrition.

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