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The Comparison of the Anemia in Pregnant and Non-Pregnant Women in the Villages of the South-East of Caspian Sea-Gorgan-Iran

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The main purpose of this study is the comparison due to Iron deficiency in the villages of Gorgan city. Forty eight and 361 non-pregnant women were classified in two groups for comparing among 415 women of 18-35 years old were chosen by compound sampling. After sampling, hematological examination was done by using Coulter counter in 9000 model and measuring of the serum iron and Total Iron Binding Capacity (TIBC) were performed by using spectrophotometry. In the pregnant women, serum Iron less than 30 mic g dL⁻¹, Hemoglobin less than 11 g dL⁻¹, Transferrin Saturation (TS) less than 16% were be consider as anemia point and in non-pregnant women, this point is the serum iron less than 40 mic g dL⁻¹, hemoglobin less than 12 g dL⁻¹ and TS less than 16%. In pregnant women, the prevalence of the anemia on the basis of serum iron index, TS and Hb in seen 24.2, 42.4, 18.2%, respectively and in non-pregnant women is 21.2, 34.55 and 20.98%. In pregnant and non-pregnant women, the Mean Corpuscular Volume (MCV) is 83.48 and 85.34 Flit. There is a significant statistical differences on base of mean of Mean Corpuscular Hemoglobin (MCH) and MCV among non-pregnant and pregnant women in 1st, 2nd and 3rd trimester (p<0.005). On the time of the sampling, 33% of pregnant and 8.4% of non-pregnant women have used Iron compounds. The results of this study shows in pregnancy period, supplement of the iron is necessary and person's need must be evaluated before prescribing drug.

Key word: Anemia, iron, pregnancy, Gorgan, Iran, malnutrition

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INTRODUCTION

Anemia due to malnutrition is one of the most important health problems affecting the psychotic, physical status and ability. Nutrition is very important during pregnancy (Demaer, 1989). Another study by Abel *et al.* (2000) reported a iron deficiency prevalence of 48% amongst pregnant women. Epidemiological studies for determining prevalence rate of anemia have seldom performed on pregnant women and some studies show that the rate of anemia in pregnant and non-pregnant women is 51 and 35%, respectively. Childbearing age women generally suffer from anemia. Iron deficiency, insufficient diet, specially protein malnutrition, successive pregnancies and excessive hemorrhagic are the main causes of anemia (Mcfee, 1979).

Pregnancy is a period of increased metabolic demands mainly due to changes in the women's physiology and the growing fetus (King, 2000). During this period, deficiency of micronutrients have detrimental effect on the health of both pregnant women and the growing fetus. Deficiency of zinc, copper, magnesium, iron, folic acid and iodine have been associated with pregnancy wastage, congenital anomalies, pregnancy induced hypertension, premature rupture of membranes, placental abruption, premature deliveries, still births and a high incidence of low birth weight babies (Yasodhara *et al.*, 1996; Almonte *et al.*, 1999; Wynn and Wynn, 1988).

Gorgan itself is a capital city of Golestan province located in the north-east of Iran and south-east of Caspian sea. Epidemiological studies carried on in Iran specially in this region is insufficient, therefore it was necessary, to have a study about above problem. This study carried out in year 2000 and its object is to compare the anemia status and some hematological index between pregnant and non-pregnant of 18-35 years old that chosen randomly in Gorgan villages.

MATERIALS AND METHODS

This study was a cross-sectional descriptive study and it was carried out n villages of Gorgan city (Iran, South-east of Caspian Sea) during year 2000.

According to last studies and report of WHO (Demaer, 1989; Abel *et al.*, 2000), the number of sample, on base of prevalence rate 40% and accuracy 0.2 and p.v (probably value) bellow 5%, were estimated 368 subject. Twenty villages as cluster were chosen from 118 villages by randomly sampling. From each village 20 of 18-35 year old women were randomly chosen by using the extent file in the health house. On the whole, 415 person were chosen as sample. Forty eight and 361 of them are pregnant and non-pregnant respectively. After sampling, hematological examination was done by using Coulter counter in 9000 model and measuring of the serum iron and Total Iron Binding Capacity (TIBC) were performed by using spectrophotometry. In the pregnant women, serum Iron less than 30 mic g dL⁻¹, Hemoglobin (Hb) less than 11 g dL⁻¹, Transferrin Saturation (TS) less than 16% were be consider as anemia point and in non-pregnant women, this point is the serum iron less than 40 mic g dL⁻¹, hemoglobin less than 12 g dL⁻¹ and TS less than 16%.

RESULTS

The mean age of the women in this study is 24.94 (pregnant women 24.6 and non-pregnant 25.4) and 70.5% of them are married and 29.5% are single. At the time of sampling, 33% of the pregnant and 8.4% of the non-pregnant women were using iron compound.

The rate of illiteracy in pregnant and non-pregnant is 39.4 and 19.9%, respectively and the others are elementary or advanced. 90.9% of pregnant women and 88.3% of non-pregnant women are housewife and the others have another jobs.

According to iron serum and TIBC, the rate of anemia in pregnant women is more than non-pregnant, but according to hemoglobin value in pregnant women the rate of anemia is less than non-pregnant. There is no statistical difference between 2 groups (Table 1).

The mean of MCH, MCV and MCHC in 2nd trimester is less than 1st and 3rd trimester in pregnant women. Also these value in non-pregnant women less than pregnant women (Table 2).

The rate of the prevalence of anemia according to Trasnferrin Saturation (TS) Iron Serum (IS) and Hb in

Table 1: The prevalence rate of Anemia on base of Iron Serum, Transferrin Serum, Hemoglobin and criteria between pregnant and non-pregnant women in rural of Gorgan

Index status	Frequency	TS		p = 0.338	Iron S		p = 0.531	Hb		p = 0.711
		F	%		F	%		F	%	
Pregnant	48	20	42.4		12	24.2		9	18.2	
Non-pregnant	361	125	34.5		76	21.2		76	20.98	

Miss = 6, F = Frequency, Iron S = Iron Serum, TS = Transferrin Serum, Hb = Hemoglobin

Table 2: Mean and Standard Deviation (SD) between pregnant and non-pregnant women in rural of Gorgan

Index status	Frequency	MCHC%		p = 0356	MCH (PicG dL ⁻¹)		p = 0.005	MCV (FL)		p = 0.006
		Mean	SD		Mean	SD		Mean	SD	
Pregnant (1st Trimester)	21	32.25	1.99		36.38	6.41		87.44	5.07	
Pregnant (2nd Trimester)	15	31.67	1.12		21.8	5.7		70.33	11.08	
Pregnant (3rd Trimester)	12	33.64	1.14		29.4	2.15		87.6	8.35	
Non-pregnant	361	32.24	1.19		27.65	3.18		85.43	8.4	

Miss = 6

Table 3: The prevalence rate of Anemia on base of Iron Serum, Transferrin Serum, Hemoglobin and criteria previous number of deliveries among women in Gorgan

Index previous number of deliveries	Frequency	TS			p	Iron S			p	Hb		
		F	%			F	%			F	%	
Non-delivery	151	64	42	0.03	36	23.8	0.112	35	23.2	0.06		
1-2 time delivery	135	38	28.1		22	16.3		30	22.2			
3 ≤ time delivery	125	48	38.4		25	28		42	33.6			

pregnant women with three parous or more is higher than women with two parous or less. χ^2 test is statistical significant between two groups ($p < 0.02$) (Table 3).

DISCUSSION

Anemia is one of the important health problems among women 18-45 years age in world and especially in development country (Isah *et al.*, 1985; Herchery *et al.*, 1987). Iron deficiency is the large factor in anemia (Dallman, 1987; Baker, 1987; Halberg *et al.*, 1979). Protein Energy Malnutrition (PEM) (19%), bleeding from alimentary tract (56%) or high bleeding in menstruation period (29%) and pregnancy (6%) to affect on iron deficiency anemia (Mcfee, 1979).

On base of results, the prevalence of anemia in pregnant women is more than the non-pregnant. Although high demand of iron to be established in pregnancy but high iron supplement intakes to recover this gap between two groups. Sadeghipour *et al.* (2001), Stevens (2000), Nestel *et al.* (1999) and Yasaii and Kimiazar (1989) in their study found similar results.

Mean hematological Index such as MCHC, MCH and MCV among pregnant women less than non-pregnant women. These results were similar with the study of Bartels *et al.* (1989).

Prevalence of anemia in women, that have primiparous, is less than multiparous and significant on base of T.S Index ($p < 0.03$). Youan (1987) reported reverse correlation between Hb value and birthrate in mothers. Andert *et al.* (2006) don't have any differences in pair groups. Decrease of iron from tissue in last gestations, malnutrition and not sufficiency iron consumption are preparation factors for above problem.

In this study we observed mean of hematological indexes during 2nd trimester less than other groups in pregnant women. High demand to nutrient without intake

iron supplement in 2nd trimester can be one of the important factor for this situation. Milman *et al.* (2000), Byg *et al.* (2000) reported a positive correlation between hematological indexes during 2nd and 3rd trimester.

This finding suggests that anemia is one of the most nutritional problems in mural's women in Gorgan district and this disorder among pregnant women is more than non-pregnant women. Multiparous is preparation factor for anemia. According to iron deficiency disorders in gestational period, we recommend that pregnant women, suffering from anemia, to intake the iron supplement.

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