

JMS (ISSN 1682-4474) is an International, peer-reviewed scientific journal that publishes original article in experimental & clinical medicine and related disciplines such as molecular biology, biochemistry, genetics, biophysics, bio-and medical technology. JMS is issued eight times per year on paper and in electronic format.

For further information about this article or if you need reprints, please contact:

G.R. Veghari
Department of Health and Social
Medicine,
Gorgan University of
Medical Sciences,
Iran

Tel: +980714421651

J. Med. Sci., 7 (2): 315-318
15th February, 2007

The Comparative Study of Anemia among Three Different Races of Women Fars-native, Turkaman and Sistanee in the Villages Around Gorgan Iran (South-East of Caspian Sea)

¹G.R. Veghari, ²A.R. Mansourian and ³A.J. Marjani

Anemia is one of the nutritional difficulties in third world (developing countries). Various factors including ecological play a role in causing anemia. This study was set up to determine iron deficiency anemia and anemia due to iron deficiency among the groups of women (Fars-native, Turkaman and Immigrant Sistanee) in villages around Gorgan. According to earlier studies it was decided to study on 415 women age 18-35 year (Fars-native = 128, Turkaman = 128 and Sistanee = 103). The sample population was chosen from 20 villages using random-clustering method. Hematological indexes and biochemical tests (serum iron and TIBC) were determined. In this study the Transferrine saturation rate <16% and Hb concentration <12 g dL⁻¹ was considered as iron deficiency and anemia respectively. The combination of iron deficiency and anemia was considered to be as iron deficiency anemia taking notice of reference value for the pregnant woman. The prevalence of iron deficiency in Fars-native, Turkaman and Sistanee women 33.6, 47.6 and 26.2%, respectively. The rate of anemia on the same women 27.7, 18.75 and 22.33% and iron deficiency anemia were 15.6, 11.9 and 11.3%, respectively. χ^2 -Test showed a meaningful in regard to iron deficiency and anemia among the three groups of women ($p < 0.005$) was seen. A significant statistical correlation was seen between Hb and MCHC in Fars-native ($r = 0.457$, $p < 0.001$), Turkaman ($r = 0.294$, $p < 0.01$) and Sistanee women ($r = 0.467$, $p < 0.001$). This correlation is strong enough in Turkaman race. From the results of this study it can be concluded that in addition to prevalence of anemia its characteristic also is different among the three groups of women. It should be added that anemia is one of the women nutritional problems in the village around Gorgan.

Key words: Anemia, iron, race, women, Gorgan

INTRODUCTION

Anemia is a disorder human being is facing since long time ago. According to the WHO report more than half all pregnant and one third of non-pregnant women who are on fertility age suffering from anemia (Demaer, 1989). Some studies predicate that anemia due to iron deficiency is 20% all over the world (Schumann *et al.*, 1998). Anemia due to iron deficiency is more common and this is a true especially among the developing world (Demaeyer and Adils, 1985). Anemia is seen predominantly among the women and especially those on fertility age. The main reasons of iron deficiency among young women are inadequate diet (especially protein deficiency), consequent pregnancies or strong bleeding during periodical cycle (Mcfee, 1979).

Deficiency anemia has side effects such as fatigue, general weakness, reduced ability to learn and low working capacity, social economical problems. For the women, on the fertility age whom on the same time doing some other works, they need further attention in this regard (Schaaf *et al.*, 2000). Various studies indicate that factors such as ethical, race, cultural, socioeconomic has got a strong correlation with anemia (Elshafei *et al.*, 1988).

Women during fertility age are susceptible to anemia and requirement for iron and other nutrients are increased, therefore, this study has been carried out during year 2000 to compare the anemia status among 18-35 years women of three races Fars-native, Turkman and immigrant Sistanees which are living in villages around Gorgan. Gorgan itself is a capital city of Golestan province located in the north east of Iran and various ethnic groups are residing in this town. The main groups are Fars-native, Turkman and Sistanees, this three groups comprise its main population.

MATERIALS AND METHODS

This study is a descriptive and cross-sectional study and 415 sample populations were chosen. In regard to earlier studies and WHO report and on the basis of 40% prevalence and accuracy of 0.2% and inaccuracy probability of less than 5%, the sample population was chosen from 20 villages out of 118 villages around Gorgan keeping in mind the proper distribution of different races in the villages. The sample population were chosen on

random cluster sampling. Women age 18-35 years of old chosen from each of above 20 villages, using the health records in the health center Fars-native (184 women), Turkaman (128 women) and Sistanees (103 women). Each woman filled a questionnaire and blood sample collected from each sample. The hematology (CBC) biochemical tests and (TIBC and serum Fe) were determined on the above blood samples. Using Counter 9000 and Spectrophotometer for hematology and biochemical tests respectively. The terms used in this study are 1- Race or ethnicity is group of people having a special traditional. 2- Fars-Native are group of people which originated from town of Gorgan (North-east of Iran) and resided in the villages around Gorgan. 3- Turkaman are a group of people in the this area rarely having family relation with other races other than Turkaman. 4- Sistanees are group of people immigrating from the province of Sistan and Baluchestan to Gorgan. 5- Iron deficiency: when the transferrin saturation is less than %16. 6) Anemia: The hemoglobin less than 12 g dL⁻¹. When anemia is duo to the iron deficiency, it is recognized as iron deficient anemia. In pregnant women the reference value is taken into consideration. The finding was analyzed using the software SPSS. For the comparison between different groups the t-test was used.

RESULTS

From 415 women under study 7.9% were pregnant and 70.5% were married. The married women according to races were Fars-native 76.6% (144), Turkaman 54.6% (70) and Sistanees 78.6% (81). The mean age of women was 24.94 years. The rate of illiteracy in Fars-native, Turkaman and Sistanees is 5.5% (10), 33.8% (43) and 33.9% (35) respectively. The mean value for serum iron and MCHC index are the lowest among Turkaman. The mean of hemoglobin of the same group was higher than other groups. T-test value between Fars-native and Turkman on base of Hb and between Fars-native and Sistanees on base of Hct and MCV and between Sistanees and Turkman on base of the serum iron and Hct showed a meaningful differences (p<0.005). Statistical correlation between Hb and MCHC in native Fars (r = 0.475 p<0.005), Turkaman (r = 0.294 p<0.01) and Sistanees (r = 0.316, p<0.001). The same correlation in Turkaman race is not strong as the others Table 1.

Table 1: Mean and standard deviation of hematological criteria among three groups in villages of Gorgan

Criteria groups	MCHC (%)	MCH (pg dL ⁻¹)	MCV (fl)	Hct (%)	Hb (g dL ⁻¹)	TIBC (µg dL ⁻¹)	Serum iron (µg dL ⁻¹)
Fars-native	32.32 (2.03)	26.79 (4.59)	84.13 (8.52)	38.47 (3.14)	12.42 (1.2)	333 (69.3)	70.8 (36.6)
Turkman	31.99 (2.2)	28.21 (3.83)	87.26 (7.4)	40.7 (4.04)	13.11 (1.49)	357 (71.99)	57.5 (36.8)
Sistanees	32.23 (1.28)	27.89 (2.91)	85.24 (9.15)	33.99 (4.22)	12.96 (1.3)	339 (66.7)	77.7 (33.8)
Total	32.2 (1.93)	27.42 (4.04)	85.88 (8.48)	39.48 (3.83)	12.76 (1.36)	341 (70.02)	68.5 (36.76)

() = ±SD

Table 2: The comparative of iron deficiency, anemia and anemia+iron deficiency among tree groups in Gorgan

Criteria group	Frequency	Iron deficiency		Anemia		Anemia+Iron deficiency		p = 0.48
		Fre	(%)	Fre	(%)	Fre	(%)	
Fars-native	184	61	33.1	60	27.7	29	15.6	p = 0.01
Turkman	128	61	47.6	24	18.8	15	11.9	
Sistanee	103	27	26.2	23	22.3	12	11.3	
Total	415	149	35.9	107	25.8	56	13.5	

Iron dif. = Iron Deficiency Fre = Frequency

Among Turkaman the rate of iron depletion was higher comparing with the other two groups. The prevalence of anemia and anemia due to iron depletion in native. Fars was higher than the other two groups. There was a meaningful correlation in regard to iron depletion and anemia using t-test ($p < 0.005$) Table 2.

DISCUSSION

Some nutrients cause the variation in blood indexes: Protein deficiency, lowering iron intake, Folic Acid and Vitamin B12 deficiency are some example. In these process iron deficiency accompanied with reduction of RBC diameter and folic acid and vitamin B12 related increasing RBC diameter. According to, different studies environmental factors such as improper nutrition the prevalence of parasitical and infectious diseases, ethnical and other racial factors unawareness can pave the way for not taking a proper amount of nutrient and consequently lead to different types of anemia.

In present study the blood indexes such as Serum iron /Hb/MCV/MCHC/MCH/ between the three race groups do not follow the same pattern. The mean serum iron MCHC in Turkaman race is lower and the mean Hb and MCV are higher than other groups. Although more studies need to be done to find out the reason for the above, variation in the region but the studies done in other parts of world show different blood index in some race groups. Liebman (Schaaf *et al.*, 2000) has done a research on blood index in 8 states of America (USA) and was found the following results: The mean Hb and Hct and transferrin saturated rate were higher in black than white races (Elshafei *et al.*, 1988). The other study (Pan and Habicht, 1991) showed the Hb concentration in white race is higher in spit of receiving adequate iron by the two groups. According to Isaacs study (Isaacs *et al.*, 1986) the mean of MCV/MCH in the immigrant Asian are lower than the European people. With regard to the above studies the variation in the blood indexes are due to the nutritional habit ethnical and racial factors.

The other findings from the present study are the prevalence of iron depletion anemia on the basis of Hb

and the combination of these two indexes among the three races (Fars-native, Turkaman, Sistanee). The X2-test show meaningful differences in regard to the prevalence of iron depletion and anemia ($p < 0.005$). This difference is not due to iron deficiency anemia. Turkaman women had the highest rate of iron deficiency and the lowest rate of anemia on the basis of Hb. Sistanee women from point of view of iron deficiency and anemia due to iron deficiency do not have a ideal status compare to other two groups (Fars and Turkaman). Similar studies are shown the different rate and prevalence of anemia among various races and ethnical groups in one region.

Jasti study (Jasti *et al.*, 2003) indicate the prevalence of anemia in British Asian and Chinese origins whom are immigrating to UK comparing to European women are 3 and 2 times, respectively. The other study done in south of Turkey by Kocak (1995) indicate the anemia rate among Arab are higher than either Turk or Kurd. The study by Adekile and Yaregri (1997) which carried out in south-west of USA show the rate of iron deficiency is lower in black compare to white race. There is not a proper study on the rate of anemia among Iranian ethnic but Sadeghepour *et al.* (2001) carried out a study on the fertilized age women in North-East of Tehran and the results from this investigation indicated that 36.48% anemia was due to iron deficiency. In this present study there was a statistical correlation between Hb and MCHC ($p < 0.05$) but there was not such correlation between the other indexes. Hershko *et al.* (1980) founds similar results.

On the basis of this study and similar investigations, but we could not determine for sure which one of the factors (either ethnical or environmental) have a definite roll in the blood indexes. The rate effectiveness of each of these factors can not be distinguished easily. It can be concluded from the findings of this study that Turkaman women from villages around Gorgan due to high rate of MCV probably facing more folic acid deficiency. Iron deficiency is worse for the same group of women.

Iron status is better among Sistanee women than the other two groups of women. Future studies are required to determine the effective factors for this heterogeneity. It showed be stressed that anemia still is one of the nutritional difficulties facing village women in Gorgan.

REFERENCES

- Adekile, A.D. and T.Z. Yaregri, 1997. Factors associated with hypochromia and microcytosis among high school students in the Southeastern United States. *South Med. J.*, 87: 1132-1137.
- Demaer, E.M., 1989. Prevention and controlling iron deficiency anemia through primary health care. *Bull. WHO, Geneva*, 78.
- Demaeyer, E. and T.M. Adils, 1985. The prevalence of anemia in the world. *World Health Stat. Q.*, 38: 302-316.
- Elshafei, A.E., P. Rao and A.K.O. Sanno, 1988. Pregnancy and sickle cell hemoglobinopathies in Bahrain, Saudi. *Med. Vol. 9 No 3 May*, pp: 483-488.
- Hershko, C., Y. Gaziel, D. Bar-Or, G. Izak, E. Naparstek, N. Grossowicz, N. Kaufman and A.M. Konijn, 1980. Anemia among Druze children in the Golan Heights. *Isr. J. Med. Sci.*, 16: 384-388.
- Jasti, S., A.M. Siega-Riz and M.E. Bentley, 2003. Dietary supplement use in the context of health disparities: Cultural, ethnic and demographic determinants of use. *J. Nutr.*, 133: 2010S-3S.
- Isaacs, D., D.G. Altman and H.B. Valman, 1986. Racial differences in red cell indices. *J. Clin. Pathol.*, 39: 105-109.
- Kocak, R., Z.N. Alparslan, G. Agridag, F. Baslamisli, P.D. Aksungur and S. Koltas, 1995. The frequency of anaemia, iron deficiency, hemoglobin S and beta thalassemia in the south of Turkey. *Eur. J. Epidemiol.*, 11: 181-184.
- Liebman, N., Y.M. Kenn and A.V. Telark, 1983. The iron status of black and white female adolescents from eight Southern States. *Am. J. Clin. Nutr.*, 38: 109-114.
- Mcfee, J.C., 1979. Iron metabolism and iron deficiency during pregnancy. *Clin. Obstet. Gynecol.*, 22: 799-806.
- Pan, W.H. and J.P. Habicht, 1991. The non-iron deficiency related difference in hemoglobin concentration distribution between blacks and whites and between men and women. *Am. J. Epidemiol.*, 134: 1410-1416.
- Sadeghepour, H., M. Farahani and E. Moghrabi, 2001. The study of prevalence and effect factors in women among 14 year in east northern of Iran. *J. Med. Council of Islamic Republic of Iran*, 2: 81-85.
- Schaaf, D., R. Scragg, P. Metcalf, C. Grant and J. Buchanan, 2000. Prevalence of iron deficiency in Auckland high school students. *N Z Med. J.*, 25: 347-50 (ab).
- Schumann, K., B. Elsenhans and A. Maurer, 1998. Iron Supplementation. *J. Trace Elem. Med. Biol.*, 12: 129-40.