Prevalence of Anemia and Correlated Factors in the Reproductive Age Women in Rural Areas of Tabas

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Abstract

Objective: To find out the prevalence and relationship of anemia in reproductive age women in rural area of Tabas, center of Iran. Iron deficiency anemia is the most common nutritional problem, affecting about 41.8% of pregnant and 30.2% of non-pregnant women worldwide.

Materials and methods: A cross-sectional study was conducted on the random sample of 382 reproductive age women in rural areas of Tabas in March 2010. Independent sample t-test, one way analysis of variance (ANOVA) and logistic regression were applied for the data analysis.

Results: The obtained data revealed a total response rate of 13.8% for prevalence of anemia, while 14.5% and 5.9% belonged to non-pregnant and pregnant participants, respectively. Low socioeconomic status (odds ratio 3.35) and high parity index (odds ratio 2.31) were associated with higher prevalence of anemia.

Conclusion: Although this study was conducted in a rural area of Tabas, where their average incomes were lower than average income of major cities in Iran, the prevalence of anemia was lower than the rate reported in previous studies carried out in other locations of Iran, even in high risk (pregnant women) groups.

Keywords: Anemia, Reproductive Age Women, Iran

Introduction

Nutritional anemia is the most common type of anemia worldwide, this mainly includes iron, folate and vitamin B12 deficiencies. The most common cause of anemia is the Iron deficiency that in most time it is not clear signs and symptoms. With consider that the most common cause of anemia, measuring the Iron deficiency anemia often counted as the prevalence of all type of anemia (1-3).

IDA is a common disorder among infants, preschool age children, young women and old people, but it can occur at all ages and in any region. A high demand for iron during pregnancy, lactation, menstrual blood loss and nutritional deficiencies are the most common causes of iron deficiency in reproductive age women. Although the diagnosis of IDA is relatively simple, it may go undiagnosed for a long time because of its nonspecific clinical signs (4, 5).

According to World Health Organization (WHO), the global prevalence of anemia is 24.8%, which means about 1.62 billion people worldwide. It is noted that the highest prevalence is in preschool age children (47.4%), while the lowest prevalence is in men (12.7%). The prevalence rates for pregnant women and non- pregnant women are 41.8% and

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30.2%, respectively; however, among different population groups, the greatest number of individuals affected by anemia belongs to non-pregnant women, 468.4 million (1, 2).

According to the WHO studies, the prevalence of anemia in Iran was 40.5% in pregnant women and 33% in non-pregnant women, considered as a severe health problem for pregnant women, as well as a moderate health problem for non-pregnant women (1). A study by Sheikholeslam et al. (2001) (6) has showed prevalence rates of anemia and IDA are 33% and 16/6%, respectively, for reproductive age women in urban and rural areas of Iran; in addition, another study by Safavi et al(7) in 2001 has revealed a prevalence of 21/5% for IDA among Iranian pregnant women.

Some previous studies showed a moderate to severe prevalence of anemia for the reproductive age women in Iran, also these studies have illustrated the action of the Iranian government about screening and supportive programs for reproductive age women, specially pregnant women in order to decrease the prevalence of anemia. Therefore, the present study was conducted to determine the prevalence of anemia in reproductive age women in rural area of Tabas, center of Iran; in addition, to identify different potential factors, like socio-cultural, economic, demographic, nutritional, reproductive and other correlates of anemia in this region in order to investigate an appropriate attempt (8).

Materials and methods

This was a prevalence study, completed in March 2010 by a cross sectional method to evaluate the anemia in reproductive women (18-49 years), living in rural area of the city of Tabas, located in the center zone of Iran in Yazd province. Two stage samples were performed as follows: (i) we chose a village by random and cluster sampling methods, then selected individuals listed in health centers of villages as our study subjects (ii) sample size was 382 individuals who were called and were informed about the study, followed by obtaining a verbal consent from all participants. The study used modified DHS Demographic Health Survey questionnaire to collect information of participants about the different variables, like economic, socio-demographic, pregnancy history, breastfeeding history, family history, contraception, residency, and literacy. Blood samples were also used to determine the hemoglobin and levels of Mean Corpuscular Volume (MCV) by

cell counter (system K-1000, TOA medical Electronics Co Ltd, Kobe, Japan). Data analysis was done using the SPSS version 17 (Inc, Chicago, IL, USA). Frequencies, percentage, mean and standard deviation were applied for the descriptive analysis. Independent sample t-test and one way analysis of variance (ANOVA) was also carried out to compare obtained levels of mean hemoglobin across different categories of the independent variables. The p value of 0.05 was taken as the level of significance. The Level of Hb in different categories of anemia was defined as follows: (i) severe anemia < 7 g/dl, (ii) moderate anemia 7-9.9 g/dl, (ii) mild anemia in pregnant women 10-10.9 g/dl, and (iv) mild anemia in non-pregnant women 10-11.9 g/dl (1).

Results

A total of 382 individuals participated in the study, out of which 369 were included in the final analysis.

Socio-demographic information

The mean age of participants was 32.65 ±8.97 years. About 4.5% of them were illiterate. The mean monthly family income was 284.4 ±163.22 US Dollars (US$), while 12.6% of them had less than 100$ of monthly family income. The socio-demographic information of participants is summarized in the Table 1.

Reproductive information

The menarche status of participants was 9.7% pregnant, 10.8% breastfeeding and 79.5% no-pregnant/no-breastfeeding. The mean age of marriage was 17.63 ±3.63 years, while 18.8% of them were married under the age of 15. The mean age of first pregnancy was 19.28 ±3.59 years, (Either you may say: 19.28 year (±3.59) OR 19.28 ±3.59 years) while 6.4% of them had their first pregnancy under the age of 15. The mean number of children was 2.56 ±2.07, while 15% of them had more than five children. Current use of contraception was 59.7% (41.3% condom, 27.2% tubal ligation, 26.8% OCP and 4.7% IUD). The reproductive information is summarized in the Table 2.

Anemia prevalence

The prevalence of anemia among participants was 13.8%. Their different levels of HB were as follows: 11.5% with mild anemia, 2.3% with moderate, and no one with severe anemia. The prevalence of anemia among non-pregnant and pregnant participants were 14.5% and 5.9%, respectively. The mean hemoglobin

Table 1: Socio-demographic information of the responders

Variables	Frequency	Percentage (%)
Age in years		
15-19	5	1.4
20-24	67	18.3
25-29	82	22.3
30-34	67	12.5
35-39	46	12.5
40-44	39	10.6
45-49	61	16.6
Type of residency		
Temporary	9	2.5
Permanent	348	97.5
Literacy		
Illiterate	16	4.5
Read and write	35	9.9
Primary school	141	39.7
Guidance school	114	32.1
Diploma	41	11.5
Upper	8	2.3
Family Income		
<100$	46	12.6
101-200$	74	20.3
201-300$	138	37.9
301-400$	51	14
401-500$	31	8.5
>500$	24	6.6

Table 2: Reproductive information of the responders

Variables	Frequency	Percentage (%)
Age of marriage		
10-14	67	18.8
15-19	205	57.6
20-24	70	19.7
25-29	11	3.1
30-34	2	0.6
34-40	1	0.3
Age of first pregnancy		
10-14	20	6.4
15-19	154	49.4
20-24	112	35.9
25-29	23	7.4
30-34	1	0.3
Number of pregnancies		
0-2	175	47.4
2<	194	52.6
Number of children		
0-2	202	54.7
2<	167	45.3
Current contraception		
None	144	40.3
OCP	51	16
IUD	10	2.8
Condom	88	24.6
Tubal ligation	58	16.2
Menarche		
No pregnant/No breast feeding	280	79.5
Pregnant	34	9.7
Breastfeeding	38	10.8

level of all participants was 13.07±1.35 g/dl. The highest prevalence of anemia was 30.5% among the age group of 40-44 years, while the lowest prevalence, practically zero, was among the age group of 15-19 years. It is interesting to know that there was approximately a linear association between increases in prevalence of anemia with individuals aged from 15 to 44 years.

Anemia related factors

In the economic status, the lowest mean hemoglobin level of 12.56±1.46 g/dl belonged to the lowest economic group, and the highest mean hemoglobin level of 13.26±1.44 g/dl belonged to the highest economic group. There was a significant correlation between anemia and family income status (p=0.05). Fig 1 shows the level of mean blood hemoglobin across different family income categories.

In the age category, the highest level of mean hemoglobin of 13.29±1.36 g/d was for group of 20-24 years old, and the lowest level of 12.73 g/dl (± 1.55 g/dl) was for group of 40-44 years old. Fig 2 shows the level of mean blood hemoglobin across different age group categories.

The women with more than two pregnancies had higher rate of anemia with odds ratio of 2.31 (95% CI: 1.21-4.41).

Type of residency, literacy, contraception and age of first pregnancy did not reveal any association with rate of anemia. Table 3 shows the correlates of anemia.

Discussion

The main finding of this study was the mild prevalence of anemia (13.8%) among reproductive age women in rural areas of Tabas, center of Iran. According to WHO, cut off points for prevalence of mild anemia is 5-19.9%, which considered as mild public health significance (1). In 2001, WHO and another study by Sheikholeslam et al (6) have reported the moderate prevalence of anemia (33%) in Iran. A study in rural areas of south India has reported the prevalence of 34.83% in reproductive age women (8). This study found the prevalence of 5.9% among pregnant women in comparison with 14.5% in non-pregnant women, despite the higher risk of anemia in pregnancy. The pregnant women are one of the vulnerable groups to the occurrence of anemia (1). The study by Safavi et al (7) in 2001 has showed a prevalence of 21.5% in pregnant women in Iran. In the study by WHO, prevalence rates of
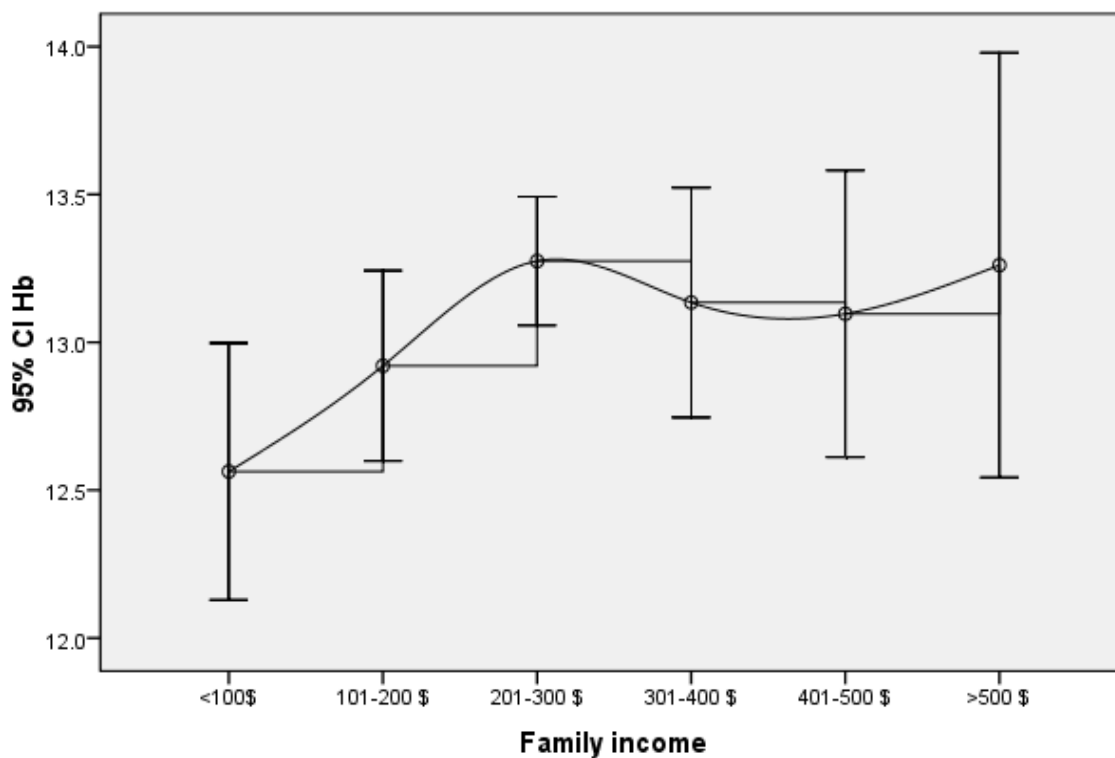
Figure 1: Level of mean blood hemoglobin with 95% CI across different family income categories
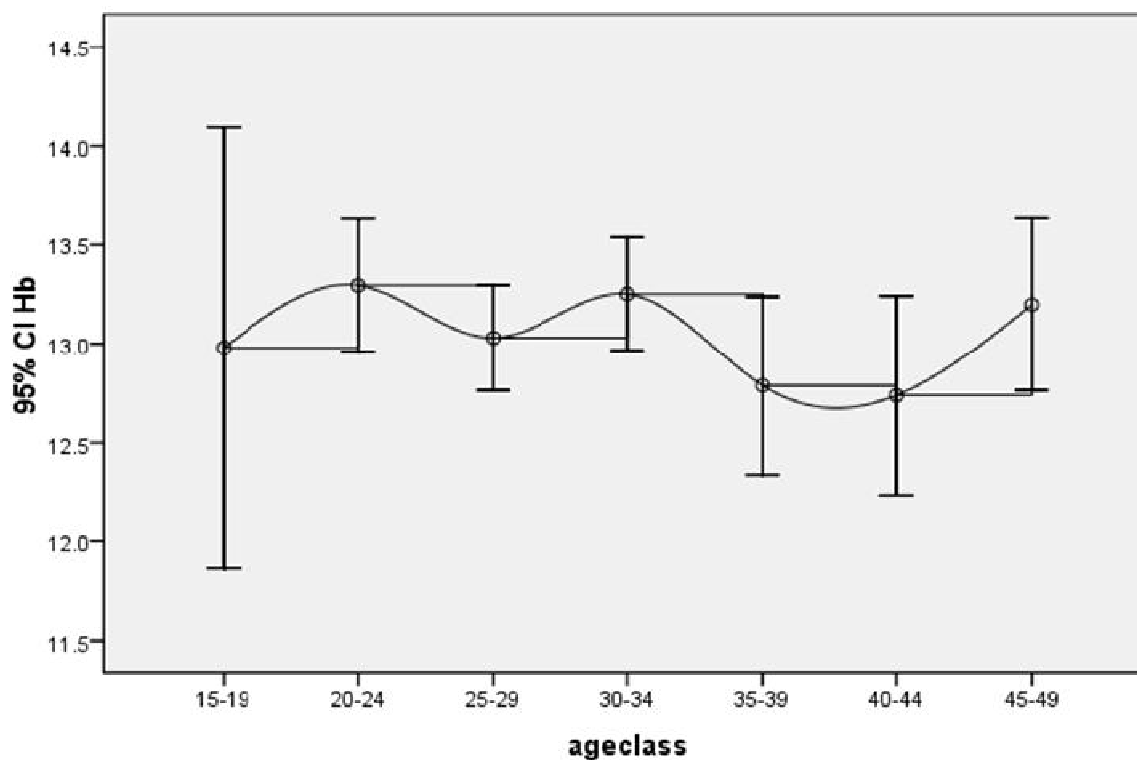

Figure 2: Level of mean blood hemoglobin level with 95% CI across different age group categories

Table 3: Correlates of anemia in Tabas, 2012

Variables	Non-anemic	Anemic	OR (95% CI)
Age in years			
15-19	5	0	0
20-24	63	3	0.23 (0.06-0.92)
25-29	72	9	0.62 (0.23-1.69)
30-34	60	6	0.5 (0.16-1.50)
35-39	34	10	1.47 (0.53-4.01)
40-44	28	11	1.96 (0.72-5.33)
45-49	45	9	1
Type of residency			
Temporary	7	1	1
Permanent	294	47	1.11 (0.13-9.30)
Literacy			
Illiterate	14	2	1
Read and write	27	7	1.81 (0.33-9.92)
Primary school	119	20	1.17 (0.24-5.57)
Guidance school	98	14	1.0 (0.20-4.87)
Diploma	36	3	0.58 (0.08-3.87)
Upper	7	1	1.0 (0.07-13.01)
Family Income			
<100$	34	12	3.35 (0.67-16.58)
101-200$	62	11	0.52 (0.34-8.28)
201-300$	122	14	1.09 (0.22-5.18)
301-400$	44	5	1.08 (0.19-6.06)
401-500$	23	5	2.65 (0.35-11.87)
>500$	19	2	1
Age of marriage			
10-14	56	11	1
15-19	171	29	0.8 (0.4-1.84)
20-24	61	8	0.66 (0.25-1.77)
25-29	9	1	0.56 (0.06-4.92)
30-34	2	0	0
34-40	1	0	0
Number of pregnancies			
0-2	155	15	1
2<	152	34	2.31(1.21-4.41)

anemia for pregnant women are 57.1% in Africa, 24.1% in Americas and 44.2% in Eastern Mediterranean, whereas the prevalence rates of anemia for non-pregnant women are 47.5% in African, 17.8% in Americas and 32.4% in Eastern Mediterranean (1). The prevalence rate of anemia in our study is lower than the reports by WHO.

We found a lower frequency and severity of anemia among reproductive age women, especially in pregnant women, indicating that anemia issue is changing from a moderate to a mild public health problem. This reduction might probably be the result

of the programs applied by Iran's Ministry of Health, which has a long term planning and interventions to reduce the prevalence of anemia among vulnerable groups, especially pregnant women. In primary health care services all supplements and care are free for all pregnant women.

In our study, being in the lower economic groups was a predisposing factor to the anemia; also other studies have reported the similar relation (9-11).

The parity had a clear effect on the prevalence of anemia, the women with more than two pregnancies had significantly higher rate of anemia. Furthermore,

other studies in Ethiopia (2) and Mexico (12) have found the same result, while a study in south India (8) has reported higher rate of anemia for the parity index more than four. This might be due to the increase of women's nutritional needs during pregnancy, and also shows the importance of contraception educations, particularly in rural areas.

The age group of 40-44 years had the highest prevalence of anemia, while the study in the Ethiopia (2) has reported the age group of 25-39 years, as the highest prevalence. A study in India (13) has assigned the younger women (<30 years old), but another study in south India (8) has considered the age group of 41-45 years for the highest prevalence. The relation of anemia and age was different for various locations.

Our study did not find any relation between literacy and anemia; it might be the low ratio of illiterate women (4.5%) in Tabas. Although some other studies (13-15) have revealed a relationship between contraception use and anemia, we did not find any relation.

Conclusion

Although this study was conducted in a rural area of Tabas, where their average incomes were lower than average income of major cities in Iran, the prevalence of anemia was lower than the rate reported in previous studies carried out in other locations of Iran, even in high risk (pregnant women) groups.

Acknowledgments

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