Prevalence and Risk Factors of Anemia in Pregnant Women in Najaf Governorate, Iraq: A Study in Primary Health Care Centers.

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ABSTRACT

Anemia is a prevalent public health concern that affects individuals in both developed and developing countries. A significant portion of pregnant women worldwide are anemic, which can have significant negative impacts on maternal, fetal, and infant health. The purpose of this study is to investigate the prevalence and risk factors of anemia among pregnant women in Najaf Governorate, Iraq. A sample of 2227 pregnant women who visited primary health care centers in Najaf Governorate were analyzed for the presence, type, and risk factors associated with anemia. The overall prevalence of anemia among pregnant women was found to be 41%. This study highlights the high prevalence of anemia among pregnant women in Najaf Governorate, and emphasizes the need for anemia prevention and control strategies, as well as educational programs, particularly in rural areas.

Keywords: Pregnancy-associated Anemia, Automated Hematological Analyzer, Predisposing Factors, Hemoglobin, Prevalence Rate

Introduction

Anemia, defined as a lack of functional red blood cells in oxygen-carrying ability, can lead to various complications throughout one's lifetime (1, 2, 3, 4, 5, 6). The condition develops due to deficiencies in one or more of iron, vitamin B12, and folic acid, with iron deficiency anemia (IDA) being the most common form during pregnancy (7). Pregnant women with hemoglobin levels less than 11g/dl in the first and third trimesters, and less than 10.5g/dl in the second trimester, are considered anemic (7).

The dilution of blood during pregnancy begins around the 8th week and continues until 32-34 weeks (7). In Iraq, the prevalence of anemia during pregnancy is considered to be of moderate public health significance, with rates between 20-39.9% as shown in Figure 1 (7). This is a significant issue as IDA affects billions of women of reproductive age and young children, particularly in developing countries where the prevalence can reach 50% (8, 9), compared to 18-20% in developed countries (10) but still remains a common issue during pregnancy (7, 10). IDA, with hemoglobin levels less than 9.0g/dl, increases the risk of preterm birth and low birth weight (11, 12, 9, 13), postpartum hemorrhage, teenage pregnancies, multiple pregnancies, short inter-pregnancy intervals, premature births, intrauterine fetal death, and intrauterine growth retardation (11, 12, 9, 13). Anemia during pregnancy has been

linked to a number of serious complications, including preterm birth, low birth weight, postpartum hemorrhage, teenage pregnancy, multiple pregnancies, short inter-pregnancy intervals, premature births, intrauterine fetal death, and intrauterine growth retardation. Additionally, IDA specifically, with Hb levels <9.0g/dl increases the risk for preterm birth and low birth weight, postpartum hemorrhage, and other complications.

Material and method:

The study was conducted between September 22nd and October 4th, 2013, among pregnant women attending primary health care centers in Najaf governorate, Iraq. A total of 2227 pregnant women were included in the study. Hemoglobin levels were measured using an automated hematology analyzer (Emerald type, manufactured by ABOTT Diagnostics, 2011). A questionnaire including demographic, behavioral and other related information was used to collect data from each woman. To ensure consistency in data collection, field workers were trained at the public health department in Najaf before the start of the study. Additionally, training was provided for haemoglobin estimation in each center where data was collected. Participation in the study was voluntary and confidentiality was ensured. After the interview, counseling, iron and folate supplementation, and treatment were offered to all women as needed.

Statistical analysis

The statistical analysis of the data was conducted using SPSS software version 17. A p-value of less than 0.05 was considered statistically significant. The data collected from the pregnant women were analyzed and presented in the form of percentages and numbers to describe the demographic and other characteristics of the sample.

Result

The results of the study are presented in Table 1, which shows the prevalence of anemia according to various risk factors. The table includes information on the number and percentage of pregnant women who were found to have anemia, broken down by factors such as age, gestational stage, and previous history of anemia. The data in the table allows for a clear understanding of the relationship between different risk factors and anemia prevalence in the population studied.

Table 1: **Prevalence of anemia according to the risk factors**

Risk factor		Prevalence of anemia	P value	Level of significance
Age	< 20 years	42.5	0.830	nonsignificant
	20 - < 30	40.6		
	30 - < 40	40.9		
	40 years & more	45		
Address	Urban	41.7	0.522	nonsignificant
	Rural	39.5		
Education	Illiterate	43.2	0.439	nonsignificant
	Read and write	38.5		
	Primary	40.2		
	Intermediate	42.5		
	Secondary	37		
	College and more	45.9		
Job	Housewife	41.6	0.358	nonsignificant
	Working	46.9		
Pregnancy no.	Primipara	43.7	0.104	nonsignificant
	Multipara	40		
pregnancy trimester	1st trimester	31.3	**0.000**	**SIGNIFICANT**
	2nd trimester	42.2		
	3rd trimester	45.6		
Interval between this pregnancy and the previous one	< 1 year	37.3	0.500	nonsignificant
	1 year - < 2 years	40.5		
	2 years and more	40.6		
Hematinic compliance	poor	41.6	0.261	nonsignificant
	good	38.6		

The present study confirms the high prevalence of anemia during pregnancy (41%) in Najaf, which is comparable to previous studies conducted in Iraq, with a prevalence of 38.2% in 2005 (7, 15, 16), 37.9% in 2006 and 39.4% in 2012). The results of the study also indicate that anemia is most common in women during the later stages of pregnancy (14), a finding consistent with previous studies conducted in China (17) and Saudi Arabia (18). It is well established that low fetal birth weight is associated with iron deficiency anemia (IDA) in the first trimester and small for gestational age (19-21), while this association is not present in the second and third trimesters (22, 23). Recent studies have focused on treating IDA in the first trimester with daily iron supplementation of 0.8mg, which has been shown to be effective in reducing the risk of IDA (24). The present study found that small for gestational age is associated with moderate and severe IDA in the early third trimester, which may be due to the increased iron requirements of the fetus during this stage of pregnancy. Contrary to previous studies, the

present study did not find a significant association between anemia during pregnancy and other risk factors such as age, residence (26), parity, birth spacing, level of education (18), and compliance with hematinic supplementation (27).

In conclusion

the present study highlights the high prevalence of anemia (41%) among pregnant women in Najaf, Iraq. The results indicate a need for a comprehensive strategy for the prevention and control of anemia, particularly in rural areas where knowledge about anemia and its causes, consequences, and preventive measures is limited. This strategy should include efforts to increase awareness about the importance of dietary iron and compliance with hematinic treatments, as well as targeted interventions to improve maternal nutrition and health.

Ethical Clearance

The study received ethical clearance from the Ministry of Health and Medical Education Research (MOHSER) and the Ministry of Health (MOH) in Iraq before being conducted.

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