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Research Article

**ANEMIA IN PREGNANT WOMEN IN ARAR, NORTHERN  
SAUDI ARABIA**

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**Abstract:**

**Background:** Anemia are important risk factors for the health and development of women as well as in the neonates. Anaemia affects one-quarter of the world's population and is concentrated in preschool-aged children and women, making it a global public health problem. Anemia is pregnancy has become an important public health issue.

**Objectives:** To find out the prevalence of anemia and evaluate its association with multiparity in pregnant women attending the Maternity and children Hospital of Arar, Northern Saudi Arabia.

**Methods:** A descriptive cross-sectional study of one 299 cases of pregnant women who came to Maternity and children Hospital of Arar, Northern Saudi Arabia, for antenatal checkup. The data was collected on a structured proforma which was evaluated subsequently.

**Results:** In a total of 299 cases, there 55.5% of the studied women (46.2%) had 2-3 children, 11.7% were primigravid and 17.4% had > 5 children. The total prevalence of Lab. diagnosed anemia among the studied pregnant women was 34.8%. Mild anemia (10-11 g/dL) was found in 26.8%, moderate anemia (7.0-9.9 g/dL) in 7.0% and severe anemia (Hb of <7 g/dL or less) in 1% of the total pregnant women, but Unknown Hb level was reported by 24.1%. There was insignificant association between lab. diagnosed anemia and parity as 53.3% cases of primigravida were suffering from anemia while in women who have 3-5 children 53.3% were anemic and multiparous (having >5children) women revealed slight increased risk of anemia with the figure of 41.5%. **Conclusion:** Anemia is quite common in the pregnant women of this region. There is slightly increased risk of anemia in primigravida as compared to multiparous female. The data highlighted the importance of iron supplements for expecting mothers and raised the need of awareness programs for the community in this regard.

**Key words:** Anemia, Primigravida, Multiparity, pregnant women.

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**INTRODUCTION:**

Anemia affects one-quarter of the world's population and is concentrated in preschool-aged children and women, making it a global public health problem. Anemia in pregnancy has become an important public health issue. The prevalence of anemia was 32.9% around the globe in 2010 [1]. Anaemia, defined as a low blood haemoglobin concentration, has been shown to be a public health problem that affects low-, middle- and high-income countries and has significant adverse health consequences, as well as adverse impacts on social and economic development [2]. This higher figure of anemia prevalence in women may be associated with loss of blood in menstruation and increased demand of iron during pregnancy [3].

A study published by Steven GA revealed the declining trend in the prevalence of anemia in pregnant and non-pregnant women. In this series, the population representative data was evaluated from different 107 countries of the world. It showed a decline in the prevalence of anemia from 33% to 29% (in non-pregnant women) and from 43% to 38% in expecting women [4].

The well-being of fetus depends upon the good maternal health because the fetus acquires nutrition and oxygen from maternal blood. There will be a compromise on the health of developing fetus in case of maternal anemia. The anemia enhances the risk of morbidity and mortality in the neonates as well as in the mothers [5]. It has been observed that maternal anemia is associated with low birth weight of neonate which is linked with increased neonatal morbidity and mortality [6]. Anemia has been considered as cause of more than one hundred thousand maternal death and more than five hundred thousand perinatal deaths every year around the world [7]

In some studies, the prenatal hemoglobin level has been linked with development of infant cognitive and motor functions [8]. Similarly, higher frequency of adverse postpartum events has been observed in anemic female as compared to non-anemic women during pregnancy [9].

The severity of anemia has been associated with maternal mortality. Certain studies have revealed that severe anemia in pregnancy has been associated with high maternal mortality<sup>(10)</sup>. The severity of anemia has been categorized by WHO as mild, moderate and severe. The hemoglobin concentration of less than 7.0 g/dL in pregnant women is classified as severe anemia while hemoglobin concentration of 7.0–9.9 g/dL as moderate anemia and hemoglobin

concentration of 10-11 g/dL in pregnancy as mild anemia [11].

Anemia in pregnancy has become an important public health issue. Poor nutrition particularly iron, vitamin B12 and folic acid are important causes of anemia. Certain nutrients like iron, zinc, iodine, vitamin A, B6, B12 and folic acid influence the outcome of pregnancy as these play an important role in signal transduction, transcription pathways and enzyme function in the gestational process [12].

Anemia in pregnancy has been associated with high parity as well [13].

The present study is conducted to find out the frequency of anemia in pregnant women and risk association of anemia with multiparity.

**MATERIALS AND METHODS:**

A descriptive cross sectional study of one 299 cases of pregnant women who came to Maternity and children Hospital of Arar, Northern Saudi Arabia, for antenatal checkup during the period of six months from 1 January to 30 June 2018. The data was collected on a structured proforma which was evaluated subsequently. The data was retrieved from the record files of cases during this time period. The information like age, gestational week, previous gestational history, blood groups and hemoglobin level, was recorded on a structured proforma.

**Ethical considerations:**

Data collector gave a brief introduction to the participants by explaining the aims and benefits of the study. Informed written consent was obtained from all participants. Anonymity and confidentiality of data were maintained throughout the study. There was no conflict of interest.

**Statistical analysis:**

We utilized the statistical package for social sciences (SPSS Inc., Chicago, Illinois, USA), version 22, to analyze the study data. The results were displayed as counts and percentages. The  $X^2$  test was used as a test of significance, and differences were considered significant at P value less than 0.05.

**RESULTS:**

In this study, Table (1) shows the socio-demographic characteristics of the studied pregnant women, Arar, Northern Saudi Arabia. From the table it is clear that, the total number of the studied pregnant participants was 299 women. more than half (55.5%) of them

aged 25-35 years, about fifth (18.7%) aged 20-25 and only 21.4% aged > 35 years. Most (82.3%) of them were highly educated (University or higher) and 52.8% were housewives. About half (55.5%) of the studied women (46.2%) had 2-3 children, 11.7% were primigravid and 17.4% had > 5 children.

Table (2) illustrates the Lab. diagnosed anemia, BMI Group and smoking, In the studied pregnant women, Arar, Northern Saudi Arabia. The total prevalence of Lab. diagnosed anemia among the studied pregnant women was 34.8%. Mild anemia (10-11 g/dL) was found in 26.8%, moderate anemia (7.0–9.9 g/dL) in 7.0% and severe anemia (Hb of <7 g/dL or less) in 1% of the total pregnant women, but Unknown Hb level was reported by 24.1%. Regarding the BMI, 47.2% were overweight, 23.1% were obese and only 2.3% underweight. About all of them 99% were non smokers.

Table (3) illustrates the association between parity and lab. diagnosed anemia in the studied pregnant women with known Hb level. There was insignificant association between lab. diagnosed anemia and parity as 53.3% cases of primigravida were suffering from anemia while in women who have 3-5 children 53.3% were anemic and multiparous (having >5children) women revealed slight increased risk of anemia with the figure of 41.5%.

Table (4) shows the association between sociodemographic variables and blood Hb level in the studied pregnant women. There was significant association between blood Hb level and BMI group and working status ( $P<0.05$ ), while Educational level and age group had a non-significant association.

Table (5) shows the complications and symptoms in anemia cases. The majority (54.8%) presented with headache, while about fifth (20.2%) had no symptoms. Most (63.5%) had no obvious complications, 20.9% had Premature labor pains.

**Table (1): Sociodemographic characteristics of the studied pregnant women, Arar, Northern Saudi Arabia (N=299)**

	Frequency	Percent
<b>Age Group</b>		
• <20	13	4.3
• 20-25	56	18.7
• 25-35	166	55.5
• >35	64	21.4
<b>Parity</b>		
• 1 <sup>st</sup> pregnancy	35	11.7
• 2-3	138	46.2
• 4-5	74	24.7
• >5	52	17.4
<b>Educational Level</b>		
• Primary	3	1.0
• Secondary	50	16.7
• University or higher	246	82.3
<b>Working Status</b>		
• Working	141	47.2
• Housewife	158	52.8

**Table (2): Lab. diagnosed anemia, BMI Group and smoking, In the studied pregnant women, Arar, Northern Saudi Arabia (N=299)**

	Frequency	Percent
<b>Lab. diagnosed anemia</b>	<b>104</b>	<b>34.8</b>
• Mild anemia (10-11 g/dL)	80	26.8
• Moderate anemia (7.0–9.9 g/dL)	21	7.0
• Severe anemia (Hb of <7 g/dL or less)	3	1.0
<b>Normal (Hb of &gt;11 g/dl)</b>	<b>123</b>	<b>41.1</b>
<b>Unknown Hb level</b>	<b>72</b>	<b>24.1</b>
<b>BMI Group</b>		
• Underweight	7	2.3
• Normal	82	27.4
• Overweight	141	47.2
• Obese	69	23.1
<b>Smoking</b>		
• Yes	3	1.0
• No	296	99.0

**Table (3): association between parity and lab. diagnosed anemia in the studied pregnant women with known Hb level, Arar, Northern Saudi Arabia, 2018 (N=227)**

Variable	Response	Anemia in pregnancy		Total (N=227)	P value
		Yes (N=107)	No (N=120)		
Parity	Primigravida	8	7	15	0.598
		53.3%	46.7%	100.0%	
	1-3	50	61	111	
		45.0%	55.0%	100.0%	
	3-5	32	28	60	
		53.3%	46.7%	100.0%	
	>5	17	24	41	
		41.5%	58.5%	100.0%	
<b>Total</b>		107	120	227	
		47.1%	52.9%	100.0%	

**Table (4): association between sociodemographic variables and Blood Hb level** in the studied pregnant women, Arar, Northern Saudi Arabia, 2018

Variable	Response	Blood Hb level					Total (N=299)	P value
		Don't know (n=72)	Sever (n=3)	Moderate (n=21)	Mild (n=80)	Normal (n=123)		
Age group	<20	5	0	1	1	6	13	0.701
		6.9%	.0%	4.8%	1.2%	4.9%	4.3%	
	20-25	12	0	4	16	24	56	
		16.7%	.0%	19.0%	20.0%	19.5%	18.7%	
	25-35	43	3	13	41	66	166	
		59.7%	100.0%	61.9%	51.2%	53.7%	55.5%	
>35	12	0	3	22	27	64		
	16.7%	.0%	14.3%	27.5%	22.0%	21.4%		
BMI group	low	5	0	0	0	2	7	0.050
		6.9%	.0%	.0%	.0%	1.6%	2.3%	
	normal	20	1	3	24	34	82	
		27.8%	33.3%	14.3%	30.0%	27.6%	27.4%	
	overweight	30	1	11	31	68	141	
		41.7%	33.3%	52.4%	38.8%	55.3%	47.2%	
obese	17	1	7	25	19	69		
	23.6%	33.3%	33.3%	31.2%	15.4%	23.1%		
Working status	Working	25	0	15	44	57	141	0.007
		34.7%	.0%	71.4%	55.0%	46.3%	47.2%	
	Housewife	47	3	6	36	66	158	
		65.3%	100.0%	28.6%	45.0%	53.7%	52.8%	
Educational level	Primary	2	0	0	1	0	3	0.490
		2.8%	.0%	.0%	1.2%	.0%	1.0%	
	Secondary	10	1	3	10	26	50	
		13.9%	33.3%	14.3%	12.5%	21.1%	16.7%	
University or higher	60	2	18	69	97	246		
	83.3%	66.7%	85.7%	86.2%	78.9%	82.3%		

**Table (5): Complications and symptoms in anemia cases. (N=104)**

	Frequency	Percent
<b>Symptoms</b>		
none	21	20.2
Foot and hand edema	40	38.5
headache	57	54.8
<b>Complications</b>		
none	<b>66</b>	<b>63.5</b>
Premature labor pains	<b>13</b>	<b>20.9</b>
Abortion	<b>9</b>	<b>13.5</b>
Hypertension	<b>8</b>	<b>7.6</b>
Placental abruption	5	4.8
Intrauterine growth retardation	<b>3</b>	<b>2.8</b>
Renal impairment	1	1.0
others	3	4.8

\*Overlapping may occur\*

## DISCUSSION:

Anemia in pregnancy is a quite common health

problem all over the world. [1] Although the most reliable indicator of anemia at the population level is blood hemoglobin concentration, measurements of

this concentration alone do not determine the cause of anemia. [4] Anemia in pregnancy is a preventable ailment and its prevention may reduce the risk for morbidity and mortality in neonates as well as mothers. [1] The present study reveals that 34.8% of the pregnant females in Arar city, Northern Saudi Arabia are anemic, this figure is consistent to figure of 38% which is documented in a study published by Steven GA [4] but is slightly low as compared to the figure of 43.1% reported by Alsibiani SA [14].

In a study published by Enera JA revealed that 58% of the pregnant women in hail region [15] had hemoglobin below normal which is much higher than the figure of 34.8% reported in our series from Arar region.

The reported figure of 34.8% (anemia in pregnant women) in the present series is quite high as compared to the developed nations of the world like USA (16.6%), Canada (22.8%) and Germany (24.4%) [16].

Our findings in the present study are in accordance with the other Arab Gulf countries in which the prevalence of anemia in pregnant women varies from 22.6% to 54% [17].

In the present study, the mild degree of anemia was most prevalent (26.8%) which was followed by moderate degree of anemia (7%). Similar found by Alsibiani SA et al., reported a greater number of mild degrees of anemia in pregnant women as compared to moderate degree of anemia <sup>(14)</sup> but in contrary to findings which has been reported by Kalaivani K [18]

In the present series, there was insignificant association between blood Hb level and parity ( $P>0.05$ ), 53.3% cases of primigravida were suffering from anemia while multiparous women revealed slight increased risk of anemia with the figure of 42%. This difference is not very significant. In some published series the prevalence of anemia has been associated with elderly women and grandmultigravidas [13,14].

Maternal iron deficiency anemia may also contribute the high prevalence of childhood anemia which may be attributed to less iron content in the milk of anemic mothers. The girls will be particularly at higher risk of anemia with subsequent onset of menstruation. The early marriage and pregnancy will further enhance the risk, and these will generate vicious cycle. This vicious cycle needs to be broken in order to avoid adverse postpartum out come and to reduce the neonatal morbidity and mortality.

Pregnancy and lactation are physiological conditions in which requirement of certain micronutrient such as iron will be increased. The requirement of iron will be increased with the advancement in pregnancy and it will be maximum during the last trimester [19-20]. The iron requirement in non-pregnant female is 0.6 – 0.8 mg and it will be increased to 2.7 mg in the last trimester of pregnancy [21].

The available data support the recommendation of iron supplements for expecting mothers or in the form of fortification of common food items with iron to increase the intake of iron in the community. Similarly, nutritional awareness programs for the community may also be helpful in this regard.

In the light of the finding, a need-based change in the curriculum for undergraduate medical students is also suggested as most of the books from western developed countries contains less matter regarding such problems as this is not important problem in their community.

#### CONCLUSION AND RECOMMENDATIONS:

In the Arar region, the Anemia is quite common among women in pregnancy. There is slightly increased risk of anemia in primigravida as compared to multiparous women. The degree of anemia was mild in majority of the pregnant women. The data highlighted the importance of iron supplements for expecting mothers and this also raises the need of awareness programs for the community.

#### CONFLICT OF INTEREST:

The authors declares no conflict of interest

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