



# Prevalence of Anemia and Its determinants among Pregnant Women in a Rural community of Jhalawar, Rajasthan

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## ABSTRACT

**Introduction:** Iron deficiency anaemia (IDA) is the most common nutritional deficiency in pregnant women. WHO estimates that anaemia affects 33% of women of reproductive age globally (about 613 million women between 15 and 49 years of age). Anaemia in pregnancy is a major issue in form of abortion, premature birth, intrauterine growth retardation, high infant mortality and 20 to 40 percent maternal death of India. Objectives: To determine the prevalence of anemia among pregnant women and to determine association of anemia with socio-demographic factors.

**Material and Methods:** A community based cross-sectional study was conducted among the pregnant women of rural area. A pre-designed and pre-tested proforma was used to collect the information regarding socio-demographic characteristics and possible risk factors of anemia. Association was established by using chi square test.

**Results:** The Prevalence of anemia among the pregnant women was 81.8%. 35.0% women were mild anemic, 45.4% were moderate and 1.4% were severe anemic. Occurrence of anemia was significantly associated with age, occupation, Parity, Timing of first ANC check up and IFA consumption of study participants.

**Conclusion:** A very high prevalence of anemia among pregnant women is a alarming sign and indicator of poor nutritional status and health care utilisation.

**Key Words:** Anemia, Pregnant women, IFA, Rajasthan, Cross sectional study

## INTRODUCTION

The anemia during pregnancy and lactation is grave condition. Iron deficiency anemia (IDA) is the most common nutritional deficiency in pregnant women. WHO estimates that anemia affects 33% of women of reproductive age globally (about 613 million women between 15 and 49 years of age). In Africa and Asia, the prevalence is highest at over 35%.<sup>1</sup>

WHO estimates that highest prevalence of anemia among women and children in WHO African Region, South-East Asia Region and Eastern Mediterranean Region.<sup>2</sup> Children under 5 years of age in

the WHO African Region represented the highest proportion of individuals affected with anemia (62.3%), while the greatest number of children and women with anemia resided in the WHO South-East Asia Region, including 190 million non-pregnant women, 11.5 million pregnant women, and 96.7 million children aged under 5 years.<sup>2,3</sup>

According to NFHS -3, 57.9% and 61.7% pregnant women age 15-49 are anemic in India and Rajasthan respectively.<sup>4</sup> Anemia in pregnancy is a major issue in form of abortion, premature birth, intrauterine growth retardation, high infant mortality and 20 to 40 percent maternal death of India.<sup>5</sup>

Illness and death of women have a significant cost for family and the community because of high direct and indirect costs. Anemia in women has enormous consequences that adversely affect both their productive and reproductive capabilities. Anemia reduces women's energy and capacity for work and therefore threatened household food security and income. Severe anemia in pregnancy impairs oxygen delivery to foetus and prevents normal intrauterine growth, resulting in intrauterine growth retardation, still birth, LBW and neonatal deaths. For this reason anemia is a major contributor to poor pregnancy and birth outcomes in developing countries as it predisposes to premature delivery, increased perinatal mortality and increased risk of death during delivery and postpartum.<sup>6</sup>

The various factors responsible for high prevalence of IDA in rural area like poverty, illiteracy, affordability and availability of health care facilities, more male preference for food leading to deprivation of females for adequate diet and iron rich food. All these factor increased malnourishment and other infections leading to more anemic state and a resultant vicious cycle of malnutrition.<sup>7</sup>

There are no studies from Jhalawar on anemia in pregnancy. This is a community based study to know the prevalence of anemia among pregnant women in south -west Rajasthan. The study aims to generate evidence that will be a tool to maternal health care planning and delivery targeted towards pregnant women.

## OBJECTIVES

The study was conducted to determine the prevalence of anaemia among pregnant women and to determine association of anaemia with its socio-demographic factors.

## MATERIAL AND METHODS

A community based cross-sectional study was conducted over a period of December, 2017 to June, 2018 among the pregnant women residing in the villages under the rural field practice areas of Department of Community Medicine, Jhalawar Medical College, Jhalawar. The sample size was calculated by using formula ( $N=4PQ/L^2$ ) for determination of sample size in community. According to this formula with 61.7% (NFHS 3) prevalence rate in Rajasthan at 95% confidence level and 10% allowable error, we obtained a sample of 248.2 and adding non-response rate of 10%, we got total sample size of 273.1 and after rounding off  $n = 280$  was taken.<sup>4</sup> **Inclusion Criteria:** All pregnant women giving consent for study were included. **Exclu-**

**sion Criteria:** who were not willing to participate in the study and Pregnant women who were not present in home after three consecutive visits were excluded. Ethical approval was obtained from the Institutional ethical committee. Written informed consent was obtained from each study participant after they were introduced to the purpose of the study and informed about their rights to interrupt the interview at any time. Anganwadi wise list of pregnant women were prepared. All the pregnant women were taken from randomly selected anganwadi till the desirable sample size obtained. A pre-designed and pre-tested proforma was used to collect the various socio-demographic characteristics like age, occupation, education, type of family, parity, gestational age, birth order, ante-natal check up, history of intake of iron and folic acid and history of deworming. Haemoglobin (Hb) estimation was done by using Sahli's haemoglobinometer in the field.

**Definitions were used are:** **Pregnant woman:** a woman whose pregnancy is confirmed by HCG test at the health center. **Normal Haemoglobin:** level of more than or equal to 11 mg/dl was considered as normal. **Anemia in pregnancy:** Any women with a Hb level of less than 11mg/dl was considered anemic. **Classification of anemia in pregnant women:** Grading of anemia based on haemoglobin level as Mild anemia 10.0-10.9g/dl, Moderate anemia 7.0-9.9g/dL and Severe anemia <7.0 g/dL.<sup>8</sup> Socioeconomic status was assessed using modified B. G. Prasad Classification taking AICPI (286) for months of December 2017.<sup>9</sup> Data entry was done using statistical software (SPSS-20 trial version). Data was analyzed in percentages and proportions. Association with variables tested using chi square test and p value less than 0.05 considered as significant.

## RESULTS

Out of 280 participants, age ranging from 19 to 35 years with mean age  $24.67 \pm 3.31$  years. Majority (85.0%) of the women were in the age group of 21-30 years. 150 (53.6%) women were illiterate. 128 (45.7%) women were working in some kind of occupation and most of women were involved in labour work. Majority of women belonged to socioeconomic strata IV (54.3%) followed by class V (29.6%), class III (15%) and class II (1.1%) however none of the participant was from class I. 38.2% of women were having second pregnancy while 34.6% were primi-gravida.

The Prevalence of anemia among the pregnant women was 81.8%. 35.0% women were mild anemic, 45.4.0% were moderate and 1.4% were severe anemic while 18.2% women were found with normal Hb status. (Table- 1)

**Table 1: Distribution of study participants according to Grading of Anemia.**

Haemoglobin status	Number (Percentage)
Normal	51 (18.2)
Anemia	229 (81.8)
Mild (10 - 10.9 gm%)	98 (35)
Moderate (7.0-9.9 gm%)	127 (45.4)
Severe (<7.0 gm%)	4 (1.4)

Table 2 depicts association of anemia with socio economic variables. Proportion of anaemic women was significantly higher ( $p = 0.002$ ) in age group 31-40 years (100%) than other age group 21-30 years (83.6%) and in women  $\leq 20$  years (60.0%). Although anemia was observed 100% in higher educated women but it was statistically not significant ( $p=0.89$ ) while level of husband education is significantly associated with anemia in pregnant women ( $p=0.01$ ).

**Table 2: Association of anemia with Socio-demographic variables**

Variables	Anemia		Total (n = 280)	Chi-square	P value)
	Present (n = 229)(%)	Absent (n = 51) (%)			
<b>Age</b>					
$\leq 20$	18 (60.0)	12 (40.0)	30	12.76	0.002
21 - 30	199 (83.6)	39 (16.4)	238		
31 - 40	12 (100)	00 (00)	12		
<b>Education</b>					
Illiterate	122 (81.3)	28 (18.7)	150	0.62	0.89
Primary	78 (81.2)	18 (18.8)	96		
Secondary	27 (84.4)	05 (15.6)	32		
Graduate & Above	02 (100)	00 (00)	2		
<b>Occupation</b>					
Working	111 (86.7)	17 (13.3)	128	3.84	0.04
Non working	118 (77.6)	34 (22.3)	152		
<b>Husband education</b>					
Illiterate	38 (80.9)	09 (19.1)	47	11.15	0.01
Primary	101 (86.3)	16 (13.7)	117		
Secondary	83 (81.4)	19 (18.6)	102		
Graduate & Above	07 (50)	07 (50)	14		
<b>Socio-economic class</b>					
II	03 (100)	00 (00)	3	5.4	0.14
III	30 (71.4)	12 (28.6)	42		
IV	130 (85.5)	22 (14.5)	152		
V	66 (79.5)	17 (20.5)	83		

**Table 3: Association of anemia with Obstetrics variables of current pregnancy**

Obstetrics Characteristics of current pregnancy	Anemia		Total (n = 280)	Chi-square	P value
	Present (n = 229)	Absent (n = 51)			
<b>Pregnancy order</b>					
First	68 (70.1%)	29 (29.9%)	97	17.70	0.001
Second	97 (90.7%)	10 (9.3%)	107		
Third	50 (80.6%)	12 (19.4%)	62		
Fourth & Above	14 (100%)	00 (00%)	14		
<b>History of miscarriage</b>					
Yes	29 (85.3%)	05 (14.7%)	34	0.32	0.57
No	200 (81.3%)	46 (18.7%)	246		
<b>First ANC check up received at</b>					
3 <sup>rd</sup> month	201 (82.7%)	42 (17.3%)	243	11.92	0.03
4 <sup>th</sup> month	05 (45.5%)	06 (54.5%)	11		
5 <sup>th</sup> month	14 (100%)	00 (00%)	14		
6 <sup>th</sup> month	04 (100%)	00 (00%)	04		
$\geq 7^{\text{th}}$ month	02 (100%)	00 (00%)	02		
No	03 (50.0%)	03 (50.0%)	06		
<b>IFA taken during pregnancy</b>					
Yes	159 (78.7%)	43 (21.3%)	202	4.59	0.03
No	70 (89.7%)	08 (10.3%)	78		
<b>De-worming tablets taken during pregnancy</b>					
Yes	08 (53.3%)	07 (46.7%)	15	8.61	0.003
No	221 (83.4%)	44 (16.6%)	265		

Anemia was significantly more prevalent in working women ( $p=0.04$ ). 100% women of socio economic class II were found anemic followed by women of class IV (85.5%).

All women of pregnancy order four and above were found anemic while only 70.1 % of primigravida women present with anemia. Association of parity with anemia was statistically significant ( $p=0.001$ ). Miscarriage in previous pregnancy was causing no significant difference in occurrence of anemia ( $p=0.57$ ). Out of 6 women who did not receive any ANC check-up, 50% was anemic and all these 6 heaving second pregnancy. Women received first ANC check-up in first trimester, 82.7% were anemic while 100 % women were anemic who received first ANC check-up in late pregnancy (5<sup>th</sup>, 6<sup>th</sup> and  $\geq 7^{\text{th}}$  months). Presence of anemia was significantly associated with receiving of first ANC check-up during pregnancy ( $p=0.03$ ). Pregnant women taken adequate IFA tablet according to prescription of health personnel, 78.7% were found anemic compare to 89.7% women who did not consume IFA tablets and this difference of anemia was found statistically significant ( $p=0.03$ ). Significant difference of anemia was found with consumption of deworming tablet during pregnancy ( $p=0.003$ ) (Table: 3).

## DISCUSSION

Present study was carried out among pregnant females in a rural area of Jhalawar, Rajasthan. Mean age of study participants was  $24.67 \pm 3.31$  years. In present study, anemia was prevalent in 81.8% of pregnant women. This is comparable to study in Pune by Ritesh P Kundap et al<sup>7</sup> in which 81% of rural women were anemic and study by Seema Kumari et al<sup>10</sup> in Bihar in which 88.5% pregnant women were anemic. In contrast to present study only 62.4% women were anemic in study conducted by Hugara Siddalingappa et al<sup>11</sup> in rural mysure. According to NFHS 4 reports<sup>12</sup>, only 48.0% of pregnant women in age group 15 to 49 years were anemic in Rajasthan state in rural areas.

In present study 1.4% women were have severe anemia. Similar results were found in study conducted by Anuja Baruah et al<sup>5</sup> and Seema Kumari et al.<sup>10</sup> However other study by Neeraj Rai et al<sup>13</sup> and shweta Rajput et al<sup>14</sup> found higher proportion of severe anemia.

In present study, percentage of anemia in  $\leq 20$ , 21 to 30 and  $\geq 30$  year age group was 60%, 83.6% and 100 % respectively and this association was found statistically significant while it was 68.4%, 75.5% and 75.7% similar age group in study of Neeraj Rai et al<sup>13</sup> and found statistically insignificant.

In present study education level of pregnant women has no significant impact in occurrence of ane-

mia similarly no significant difference in anaemia according to education level of the women was found in study of Vijay Kumar et al.<sup>15</sup> However contrast result was observed by Gautam VP et al<sup>16</sup> and Thangaleela T et al.<sup>17</sup>

In present study, occurrence of anaemia was significantly associated with educational status of Husband of study participants. However, no association found in anemia among pregnant women with educational status of Husband in study by K.N. Agarwal et al.<sup>18</sup>

In present study socio-economic status had no significant association with anemia similarly Vijay Kumar et al<sup>15</sup> reported that association was not significant, although Neeraj Rai et al<sup>13</sup> observed significant association of socio-economic class with occurrence of anemia.

In present study, occurrence of anemia was significantly associated with order of pregnancy, timing of first ANC check up, IFA and Deworming tablet consumption. Similar to our study, Anemia was more common in multipara in study by Ritesh Kuldap et al<sup>7</sup>, Seema Kumari et al<sup>10</sup> and Shweta Rajput et al.<sup>14</sup> However, the gravida was not found to be significantly associated with presence of anemia in the pregnant women in study by Anuja Baruah et al.<sup>5</sup> In accordance to our study, anemia was more common among women who were not taking IFA supplementation in study by Paramatma Singh et al.<sup>19</sup> However, in study by Hugara Siddalingappa et al<sup>11</sup>, occurrence of anemia was not significantly associated with parity of the pregnant women and IFA consumption.

## CONCLUSION

The present study revealed that a very high prevalence of anemia among pregnant women is a alarming sign and indicator of poor nutritional status and health care utilisation. Anemia was significantly associated with age, occupation, parity, timing of first ANC check up, IFA consumption and de-worming of study participants. Addressing determinants, there is a scope to improve maternal anemia in this area.

**Recommendation:** High prevalence of anemia and association with socio-demographic factor indicating the necessity of improvement of socio-demographic factors to tackle this alarming condition. Awareness regarding regular antenatal check-up, regular intake of iron and folic acid tablet and de-worming tablets in reproductive age groups is highly recommended. There is need to address multiparity and pregnancy in late age to reduce chances of anemia. There is scope for intense re-

search and evidence generation to combat anemia in this area.

### Limitation

In present study others causes of anemia like haemoglobinopathies were not considered which are also important causes of anemia in the study area.

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