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Original Research Article

Association of Mild, Moderate and Severe Anemia during Pregnancy with Maternal and Foetal Outcome: A Cross Sectional Study on the Poor Pregnant Women of Ajmer City, India

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ABSTRACT:
The most commonly prevalent harm that occur during pregnancy is anemia caused mainly due to nutritional deficiencies. The present study aims to study the association of mild, moderate and severe anemia with maternal and foetal outcome on the poor pregnant women of Ajmer city of India who are most vulnerable group when concerned with food. It was a cross sectional, descriptive and a questionnaire based study on the target group coming to Janana Hospital for their delivery. Around 300 patients were studied. They were bifurcated as anemic and non anemic. The maternal outcomes post-partum haemorrhage (PPH), preeclampsia and blood transfusion. Foetal outcome was assessed on the basis of their neonatal weight at birth and Apgar score at first and fifth minute. Post delivery, it was found that there was a significant association between anemia during pregnancy and PPH; however severe anemia could be associated with blood transfusion and preeclampsia. Foetal outcomes in terms of birth weight and Apgar score were also significantly correlated with an increase in the intensity of anemia. The study suggests a strong adverse association between maternal anemia on maternal and foetal outcome among the target group.

Keywords: *Anemia, Apgar score, Birth weight, Blood transfusion, Post-partum haemorrhage, Preeclampsia, Pregnant women.*

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INTRODUCTION

Maternal anemia is a global pandemic affecting the health of the women of the reproductive and also the life and future of the unborn child causing havoc in developing as well as in developed nations. (Young et al., 2019) In developing countries like India thousands of women die due to pregnancy related issues. (Labib et al., 2021) The mortality rate for women has been recorded to be 34/100,000 live births; specifically assigned due to anemia (Helmy et al., 2018).

Maternal health also is adversely affected with anemia which even results with maternal mortality. The severity increases with decrease in maternal age and those from low socio-economic backgrounds (Iyengar, 2012).

Anemia during pregnancy causes adverse effect on the neonatal ranging from pre-term delivery, low birth weight, low Apgar score and even neonatal and infant mortality; without mentioning the long term adverse effects (Cnattingius et al., 2020).

In our research I have tried to evaluate the association of mild, moderate and severe maternal anemia in poor women with maternal and foetal outcomes. Maternal outcomes measured as postpartum haemorrhage, preeclampsia and blood transfusion; while neonatal outcomes measured in terms of neonatal birth weight and Apgar score at first and fifth minute.

MATERIALS AND METHOD

A prospective cross- sectional and cohort study was carried out between January 2020 to April 2021 at two government hospitals namely Janana Hospital and Satellite Hospital, and a private hospital namely St. Francis Hospital. A final of 300 women were taken for the research. The inclusion criteria were that the women had only singleton pregnancy and belonged to the poor section of the society. The exclusion criteria included women who discontinued due to the pandemic, those refused to give their consent, women suffering with hypertension, diabetes, and ante partum haemorrhage.

The consent was duly signed by the women who were willing to participate in the research after a proper explanation of the research work that was being carried out. The consent form was counter signed by two witnesses. The ethical clearance was sought from the Ethical committee of Satellite hospital, Janana hospital, and St Francis hospital respectively.

The study was based on the secondary data made available by the women consisting of their haemoglobin level. Based on it the women were divided into two categories as anemic and non anemic. The anemic were further classified as mild, moderate and severe anemic if they had their Hb level between 10 and 11g/dl, or between 7 to 9.9 g/dl or less than 7 gm/dl respectively.

Maternal outcomes were studied with respect to postpartum haemorrhage, preeclampsia and blood transfusion at the time of delivery or just after delivery. However, neonatal outcome was measured in terms of neonatal weight (normal range varies between 2500gms to 3500gms) and Apgar score at 1 minute (6 to 7) and at 5 minutes (normal range varies between 8 to 10).

RESULTS

In the cross sectional prospective study that was carried out, we finally had 300 pregnant women. They were divided into two categories depending on their haemoglobin level as anemic and non anemic (Table 1). It was found that among 300 poor pregnant women; 256 were found to be anemic, suggesting that the pregnant women of poor strata were more prone to develop anemia during pregnancy. The anemic group was further divided into mild, moderate and severe (Table 2). There were 36.71% who suffered with mild anemia, while 54.29% anemic women had moderate anemia and almost 8.98% women suffered from severe anemia.

Comparing the maternal outcome in both the study group comprising of anemic and non anemic group, it was found that anemic women suffered more severely with postpartum haemorrhage, preeclampsia and needed blood transfusion. The number of preeclampsia cases were found to be more in women who suffered with severe anemia; whereas, both moderate and severe anemic cases needed blood transfusion. The 17.96 anemic women suffered with postpartum anemia and nearly 43% women suffered with preeclampsia in the anemic category. Nearly 44% anemic women required a blood transfusion (Table 3).

While evaluating the impact of anemia on the neonate, it was found that the neonatal weight, Apgar score at 1st minute and at 5th minute had comparatively higher means in the non anemic group than in the anemic group (Table 4).

Table 1: Distribution of frequency of anemia

Total No. of Women	Anemic	Non Anemic
300 (100%)	256 (85.33%)	44 (14.66%)

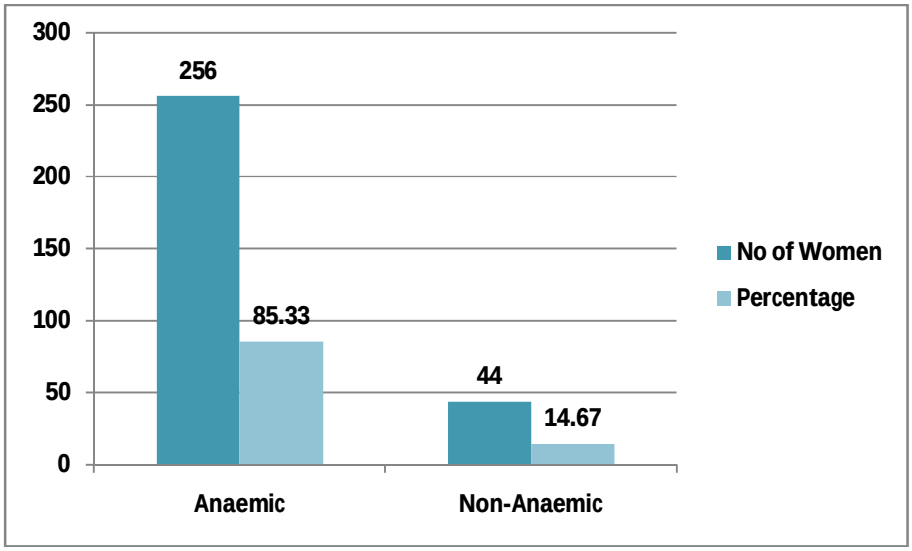

Figure 1: Distribution of frequency of anemia

Table 2: Severity of anemia among the pregnant women

Grades of Anemia (g/dl)	Total No. Of Women
Mild (10 to 10.9)	94 (36.71%)
Moderate (7.1 to 9.9)	139 (54.29%)
Severe (>7)	23 (8.98%)

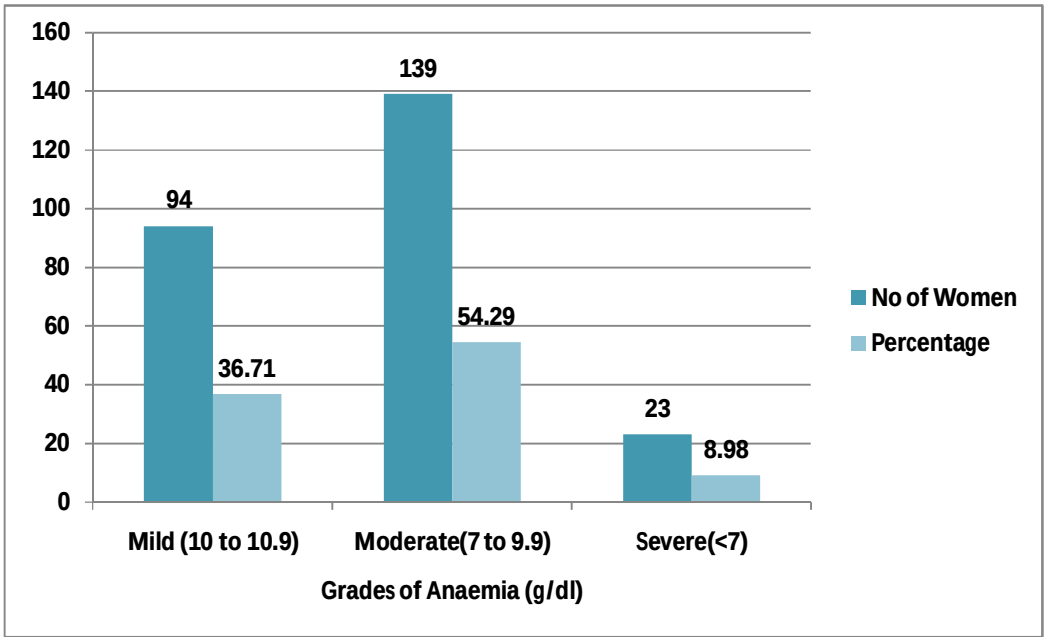

Figure 2: Severity of anemia among pregnant women

Table 3: Maternal outcomes among the anemic and non anemic pregnant women

Maternal Outcome		Study Group	
		Anemic Group	Non-Anemic Group
Post-partum haemorrhage	Yes	46 (17.96%)	02 (4.54%)
	No	21 (08.20%)	01 (2.27)
Preeclampsia	Yes	109 (42.57%)	21 (47.72%)
	No	31 (12.10%)	06 (13.63%)
Blood Transfusion	Yes	112 (43.75)	09 (20.45%)
	No	4 (01.56%)	19 (43.18%)

Table 4: Neonatal outcome among the anemic and non anemic pregnant women

Foetal Outcome	Study Group		P-value
	Anemic Group N= 256 Mean ± S.D	Non-Anemic Group N=44 Mean ± S.D	
Neonatal weight (Grams)	2026±226	32310± 189	<0.001
APGAR Score at 1st minute	4±1	7±1	<0.001
APGAR Score at 5th minute	5±1	8±1	<0.001

DISCUSSION

Throughout the study there was a track of the association of various grades of anemia on the maternal in terms of postpartum haemorrhage, preeclampsia and blood transfusion and neonatal outcomes as neonatal weight and Apgar score at the first and fifth minute.

It was found that the women who were anemic suffered with postpartum haemorrhage. However, there are literatures that support our findings but there are a few studies carried out that show no relation between anemia and postpartum haemorrhage, however our research was in favour of the fact that pregnant women with moderate and severe anemia had higher probability of having post partum haemorrhage.

Our study showed positive significant correlation between anemia in the pregnant women and the occurrence of maternal complications like post partum haemorrhage, preeclampsia and blood transfusion. The incidences of preeclampsia were more for those who were suffering with severe anemia. Similar observations were also made in other literature that stated that Hb level below 7gm/dl increased the cases of preeclampsia.(Ali et al., 2011) Our research was also supported by the fact that nutrition deficiency which indirectly lead to anemia also causes preeclampsia (Endeshaw et al., 2014). Studies have proved that preeclampsia also has adverse effect on the birth outcome with respect to preterm and low birth weight as stated significantly in our research (Ali et al., 2011).

Incidence of blood transfusion increased as there was a reduction in their haemoglobin level. Severe the anemic case, more units of blood were transfused to the mother. This also can accelerate the incidences of diverse infections (Rouse et al., 2006).

There was a significant effect on the neonatal outcome as shown by the result of low birth weight low and Apgar score at the first and fifth minute for the anemic mothers. Our results were validated by similar studies carried out that stated adverse neonatal outcome due to anemic pregnancies.

CONCLUSION AND RECOMMENDATION

The above carried research therefore conclude that maternal anemia adversely affect both maternal outcome in terms of postpartum haemorrhage, preeclampsia and blood transfusion. The severity is grievously fatal in case of severe anemic cases. Maternal anemia adversely affects the neonatal weight at birth and the Apgar score.

Therefore, it is highly recommended that there should be ways and means for an

early detection of anemia in the target group that is the women at reproductive age very specifically belonging to the poor strata. Management of anemia with utmost care stressing on nutritional health during the antenatal visits play a pivotal role in minimizing the incidences of anemia thus avoiding its hazardous effects in terms of maternal and neonatal outcomes.

Ethical Issues

The ethical clearance was taken from the Ethical Committee of Satellite hospital, Janana hospital and St Francis hospital. Personal consent form was duly signed in the presence of two witnesses by the pregnant women after the research study was fully explained to them.

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