



COMPARISON OF PREGNANCY OUTCOMES OF ANAEMIC AND NON- ANAEMIC MULTIGRAVID WOMEN VISITING GOVERNMENT MEDICAL COLLEGE AND HOSPITAL, SECTOR-32, CHANDIGARH

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ABSTRACT

Anaemia is crucial among all nutritional disorders all over the world. Anaemia in pregnancy can lead to many complications during antenatal, intra-natal, and post- natal period including pre- term birth, low birth weight babies; small for gestational age babies and incidence of post- partum haemorrhage that leads to high maternal and neonatal morbidity and mortality rates. The present study was aimed to find out and compare the pregnancy outcomes of anaemic and non- anaemic multigravid women. Quantitative research approach using descriptive study design was used to conduct the study on 120 subjects. The prevalence of anaemia was found to be 37.5% at the time of enrolment. Statistically significant difference was found in the haemoglobin level of the anaemic and non- anaemic study groups at the time of delivery. No statistically significant difference was found in the groups on mode of delivery, period of gestation at delivery, placenta weight and neonatal outcomes. Haemoglobin level of the study subjects at the time of delivery was found to be associated significantly with the socio- economic class score. It is important to detect anaemia early in pregnancy and take steps to control the same by considering the social and economic conditions at the earliest with the goal to reduce maternal and neonatal morbidity and mortality rates.

KEYWORDS : Pregnancy Outcomes, Anaemic And Non-anaemic Multigravid Women.

Introduction-

Anaemia in pregnancy is commonly associated with poor pregnancy outcomes and can result in complications that threaten the life of both mother and fetus.¹ As per WHO statistics, 58% women in India are anaemic and anaemia is the underlying cause of 20-40% of maternal deaths.²

During pregnancy it can lead to pre-eclampsia (30%), inter-current infection, heart failure, pre-term labour (28%). During Labour, it can lead to uterine inertia, post-partum haemorrhage, cardiac arrest, shock (hemorrhagic). During Puerperium, it can lead to puerperal sepsis, sub-involution, failing lactation, puerperal venous thrombosis and pulmonary embolism.³

Favourable pregnancy outcomes occur 30-45% less often in anaemic mothers and their infants have less than one-half of normal iron-reserves. India contributes to about 80% of the maternal deaths due to anaemia in South Asia. In India, nearly 281.8 mothers dies / 1 lakh live births and unless more is done address this, India will be counted among 53 other countries with maternal mortality ratios above 100 in 2030.⁴ It is obvious that India's contribution both to the prevalence of anaemia in pregnancy and maternal deaths due to anaemia is higher than warranted by the size of its population.⁵

The results of a cohort study showed that severe anaemia in pregnancy results in relatively poor maternal and foetal outcomes. Apparently maternal risks increase prior to foetal risks.⁶

In a study, it was found that the women who were first diagnosed with anaemia at 13-24 weeks of gestation had 1.18-1.75 fold higher risk of pre-term birth, low-birth weight and pre-natal mortality.⁷ The findings of a prospective longitudinal study conducted on 377 primigravida women enrolled and obstetric outcomes studied in 179 (group 1) and 149 (group 2) excluding women who did not complete study in All India Institute of Medical Sciences, New Delhi

reveals that the adverse post- partum events (7.6%) were seen more in anaemic compared to non- anaemic pregnant women.⁸

The findings of a retrospective cohort study reveals that women with severe anaemia had a higher odds of PPH (adjusted OR= 9.45; 95% 2.62 to 34.05), giving birth to low birth weight (OR= 6.19; 95% CI 1.44 to 26.71) and small for gestational age babies (OR= 8.72; 95% CI 1.66 to 45.67) and perinatal death (OR= 16.42; 95% CI 4.38 to 61.55). Odds of PPH increased 17- fold among women with moderate-severe anaemia who underwent induction of labour and 19- fold among women who had infection and moderate- severe anaemia.⁹

Methods-

Quantitative research approach was used to conduct a descriptive study to find out and compare the pregnancy outcomes of anaemic and non- anaemic multigravid women visiting Government Medical College & Hospital, Sector-32, Chandigarh. The study was approved by the research and ethics committee of the institute. One hundred and twenty subjects were selected using the consecutive sampling technique. The subjects were explained about the study and informed written consent was obtained and confidentiality was maintained.

Demographic profile of the study subjects was assessed by using demographic profile sheet. Degree of anaemia and type of anaemia prevalent among multigravid mothers was assessed from the haemoglobin level and RBC indices. Pregnancy outcomes were recorded and assessed from the developed and validated pregnancy outcome (both maternal and neonatal) Performa. The collected data was analyzed by using descriptive and inferential statistics by calculating the frequency, percentage, mean, standard deviation and chi- square values. The study was taken with the following objectives-

Objectives:

1. To find out and compare the pregnancy outcomes of anaemic

- and non-anaemic multigravid women.
- To find the association between the selected demographic variables and pregnancy outcomes of multigravid women.

Results-

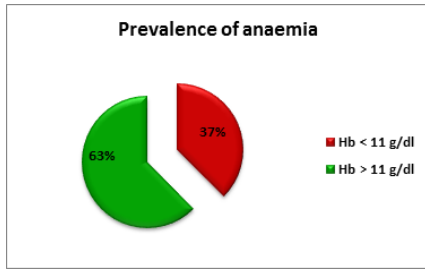


Figure.1. Prevalence of anaemia among multigravid women
 Analysis of 120 multigravid women who attended OPD, reveals that at the time of enrolment in the study, 37.5% subjects i.e. 45 out of 120 study subjects had haemoglobin < 11 gm/dl (were anaemic) and 75 (62.5%) subjects had haemoglobin > 11 gm/dl (were non anaemic) as shown in figure.1.

Table.1. Haemoglobin level of the study subjects at the time of delivery N= 120

Hb level (in g/dl)	Non- anaemic group N= 75	Anaemic group N= 45
7.1- 9.9	2 (2.6)	9 (20.0)
10- 10.9	8 (10.7)	6 (13.3)
≥ 11	65 (86.7)	30 (66.7)
Chi- Square Value	$\chi^2 = 10.811^* S$ p= 0.004 at df= 2	

At the time of delivery, 30 i.e. 66.7% of the multigravid mothers in the anaemic group were non- anaemic i.e. haemoglobin level > 11g/dl. Only 6 i.e. 13.3% had moderate anaemia and 9 out of 45 (20.2%) had severe anaemia at the time of delivery. There was highly significant difference between the haemoglobin level of the subjects in the anaemic and non- anaemic groups with $\chi^2 = 10.811$, p=0.004, df= 2 at the time of delivery as shown in table 1.

In the non- anaemic group, 3 (4%) subjects and in the anaemic group, 2 (4.4%) subjects had undergone dilatation and curettage.

Majority of the study subjects in both the groups delivered between 37- 40 weeks of period of gestation i.e. 51 (68%) in non- anaemic and 34 (75.6%) in the anaemic group. There was no statistically significant difference between both the groups as per gestational age at the time of delivery.

Most of the subjects in both the group had delivered by caesarean section. It was 43 (57.3%) and 27 (60.0%) in the non- anaemic and anaemic groups respectively. Out of 75 subjects in the non- anaemic group, 26 (34.7%) and out of 45 subjects in the anaemic group, 14 (31.2%) had normal vaginal delivery. The groups were not statistically different.

Table. 3. Association between selected socio- demographic variables and the maternal outcomes

Socio- demographic variable	Hb level at delivery χ^2 p df	POG χ^2 p df	Mode of delivery χ^2 p df	Duration of labour χ^2 p df	PPH χ^2 p df	Blood transfusion χ^2 p df	Placenta weight χ^2 p df
Present age	4.579, 0.801, 8	7.147, 0.521, 8	38.827, 0.084, 28	2.484, 0.981, 9	24.375, 0.000, 4**S	41.679, 0.003, 20**S	34.245, 0.080, 24
Residence	5.038, 0.283, 4	1.184, 0.881, 4	16.054, 0.310, 14	8.622, 0.196, 6	1.087, 0.581, 2	6.549, 0.767, 10	11.505, 0.486, 12
Religion	7.740, 0.258, 6	5.690, 0.459, 6	6.789, 0.999, 21	47.966, 0.000, 9**S	0.356, 0.949, 3	42.745, 0.000, 15**S	11.887, 0.853, 18
BMI	2.594, 0.858, 6	3.786, 0.706, 6	15.645, 0.789, 21	9.805, 0.366, 9	0.460, 0.928, 3	5.585, 0.986, 15	15.879, 0.601, 18
Dietary habits	2.671, 0.614, 4	0.729, 0.948, 4	13.093, 0.519, 14	4.019, 0.674, 6	0.308, 0.857, 2	12.344, 0.263, 10	5.316, 0.947, 12
Educational status	16.829, 0.156, 12	13.873, 0.309, 12	47.670, 0.253, 42	30.77, 0.009, 15**S	9.326, 0.156, 6	30.950, 0.418, 30	29.977, 0.750, 36

In both the groups, study subjects who delivered through normal vaginal delivery, the duration of labour was normal i.e. between 5.5 to 12 hours. The duration of labour was not known in 10 (38.5%) and 5 (35.7%) in the non- anaemic and anaemic groups respectively. There was no statistically significant difference between both groups.

Although, 4 (8.9%) subjects received blood transfusion in the anaemic group and 1 (1.3%) in the non- anaemic group but no statistically significant difference was found between the groups.

Maximum of the subjects i.e. 83 (69.2%) total in both the groups had normal placenta weight (451- 550 grams). There was no significant difference between the groups with regard to placental weight.

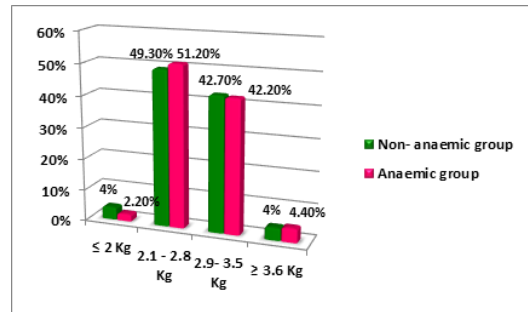


Figure.2. Comparison of birth weight of the study subjects.
 Majority of the subjects in non- anaemic as well as anaemic group had birth weight of the baby ≥ 2 Kg with 72 (96%) out of 75 and 44 (97.8 %) out of 45 respectively. No statistically significant difference was found between the groups as per birth weight of the baby. Birth weight of the subjects is depicted in figure.2.

Table.2. Comparison of neonatal outcomes among non- anaemic and anaemic group

Neonatal Outcome	Non- anaemic group N= 72	Anaemic group N= 43	χ^2 Value	df	p- value
Small for gestational age	03	-	3.485	3	0.323 NS
Pre- term birth	16	07	2.206	3	0.531 NS
Low birth weight baby	4	-	4.102	3	0.251 NS
APGAR < 7 at 1 minute	1	1	1.851	3	0.604 NS
Intra- uterine death (IUD)	-	01	1.701	2	0.427 NS

NS- Not Significant

Neonatal outcomes were assessed in 115 cases (72 in non- anaemic and 43 in the anaemic group). APGAR < 7 at 5 minutes, IUGR, congenital malformation and neonatal sepsis was not found in any case. There was no significant difference found in the neonatal outcomes of non- anaemic and anaemic study subjects as shown in table.2.

Occupational status	2.256, 0.994, 10	3.529, 0.966, 10	41.399, 0.211, 35	1.709, 0.635, 3	0.373, 0.996, 5	1.041, 1.000, 25	9.324, 1.000, 30
Type of family	2.839, 0.242, 2	2.006, 0.367, 2	4.023, 0.777, 7	0.521, 0.914, 3	1.373, 0.996, 5	7.973, 0.158, 5	17.770, 0.007, 6**S
Socio-economic class score	12.704, 0.048, 6* S	8.619, 0.196, 6	16.780, 0.724, 21	9.294, 0.411, 9	3.727, 0.293, 3	11.152, 0.742, 15	18.607, 0.416, 18
Medical history	2.256, 0.999, 12	31.160, 0.002, 12**S	16.371, 1.000, 42	3.244, 0.954, 9	0.373, 0.999, 6	1.207, 0.000, 30**S	84.821, 0.000, 36**S

*S= Significant

Association between the selected socio- demographic variables and the pregnancy outcomes is shown in table.3. Haemoglobin level at delivery was significantly associated with the socio-economic class score with χ^2 value of 12.704 at df= 6, p= 0.048 < 0.05. Period of gestation at delivery was significantly associated with the medical history ($\chi^2 = 31.160$ at df= 12, p= 0.002). Mode was delivery was not found to be associated with any socio- demographic variable. Duration of labour was significantly associated with the

religion and educational status ($\chi^2 = 47.966$ at df= 9, p= 0.000 and $\chi^2 = 30.77$ at df= 15, p= 0.009 respectively). Occurrence of post- partum haemorrhage was found to be significantly associated with the age of the study subjects with χ^2 value of 24.375, p= 0.000, df=4. Blood transfusion was found to be highly associated with age, religion and medical history with chi-square value of 41.679 at df= 20, p= 0.003; 42.745 at df= 15, p= 0.000 and 1.207 at df= 30, p= 0.000 respectively. Placenta weight was found to be associated with the type of family and medical history ($\chi^2 = 17.770$ at df= 6, p= 0.007 and $\chi^2 = 84.821$ at df= 36, p= 0.000 < 0.05).

Table. 4. Association between selected socio- demographic variables and the neonatal outcomes

Socio- demographic variable	Birth weight χ^2 p df	SGA χ^2 p df	Pre-term birth χ^2 p df	LBWB χ^2 p df	APGAR at1minute χ^2 p df
Present age	36.435, 0.050, 24*S	51.933, 0.000, 12**S	50.404, 0.000, 12**S	49.821, 0.000, 12**S	49.045, 0.000, 12**S
Residence	10.181, 0.600, 12	2.166, 0.904, 6	3.259, 0.776, 6	3.389, 0.759, 6	2.513, 0.867, 6
Religion	18.263, 0.438, 18	21.972, 0.009, 9**S	3.982, 0.913, 9	17.430, 0.042, 9*S	2.854, 0.970, 9
BMI	14.790, 0.676, 18	7.146, 0.622, 9	7.489, 0.586, 9	9.335, 0.407, 9	5.463, 0.792, 9
Dietary habits	3.758, 0.987, 12	0.963, 0.987, 6	2.146, 0.906, 6	1.120, 0.981, 6	5.249, 0.512, 6
Educational status	38.218, 0.369, 36	18.866, 0.400, 18	20.435, 0.309, 18	19.981, 0.334, 18	16.026, 0.591, 18
Occupational status	7.070, 1.000, 30	0.695, 1.000, 15	2.732, 1.000, 15	0.779, 1.000, 15	0.612, 1.000, 15
Type of family	12.638, 0.049, 6*S	13.048, 0.005, 3**S	1.663, 0.645, 3	8.741, 0.033, 3*S	2.635, 0.451, 3
Socio- economic class score	16.284, 0.573, 18	8.028, 0.531, 9	9.130, 0.425, 9	6.374, 0.702, 9	6.205, 0.719, 9
Medical history	94.639, 0.000, 36**S	39.826, 0.002, 18**S	10.386, 0.919, 18	29.810, 0.039, 18*S	0.612, 1.000, 12

*S= Significant

There was significant association between birth weight of the baby with age of the study subjects, type of family and medical history ($\chi^2 = 36.453$, p= 0.050, df= 24; $\chi^2 = 12.638$ at df= 6, p= 0.049, $\chi^2 = 94.639$ at df= 36, p= 0.000 respectively). Small for gestational age was highly associated with age of the subjects, religion, type of family and medical history ($\chi^2 = 51.933$, 21.972, 13.048 and 39.826 at df= 12, 9, 3, 18 and p= 0.000, 0.009, 0.005 and 0.002 respectively). Pre-term birth was significantly associated with age of the study subjects with $\chi^2 = 50.404$, df= 12, p= 0.000. Incidence of low birth weight baby was found to be associated with the age ($\chi^2 = 49.045$, df= 12, p= 0.000), religion ($\chi^2 = 17.430$, df= 9, p= 0.042), type of family ($\chi^2 = 8.741$, df= 3, p= 0.033 and medical history ($\chi^2 = 29.810$, df= 18, p= 0.039) as shown in table.4.

Discussion-

Untreated anaemia has significant adverse fetomaternal consequences. It contributes significantly to high maternal morbidity and mortality.⁵ Severe anaemia is also associated with adverse maternal outcome and may contribute directly or indirectly to a significant proportion of maternal cardiac failure, haemorrhage and infection.¹⁰

The findings of the present study show that haemoglobin level at the time of delivery is significantly associated with the anaemic status during pregnancy. The findings are consistent with a prospective, observational and longitudinal study done to assess the prevalence of anaemia in the immediate postpartum period (48-72hours), determine the risk factors and the value of haemoglobin before birth to reduce postpartum anaemia.¹¹

The findings of a study reveal that younger adolescents had an increased risk of maternal anaemia (aOR = 1.25; 95% CI, 1.07-1.45), preterm delivery at less than 37 weeks of gestation (aOR = 1.36; 95% CI, 1.14-1.62)¹² however the findings of the present study showed

that haemoglobin level at delivery was significantly associated with the socio- economic class score.

The findings of an observational study to evaluate maternal and perinatal outcome of life- threatening obstetric complications requiring multiple transfusions shows that haemorrhage was the most common indication for transfusion however the results of the present study depicts that blood transfusion was highly associated with age, religion and medical history.¹³

The results of the present study are consistent with the findings of a prospective study that there was no statistically significant effect of anaemia on adverse pregnancy outcomes (small for gestational age, pre- term birth, mode of delivery, low birth weight, APGAR score < 7 at one and five minutes).¹⁴

The outcomes of the present study also unfolds that period of gestation at delivery is significantly associated with weight of the study subjects and highly associated with the medical history. Duration of labour was significantly associated with the religion and educational status of the study subjects. Incidence of dilatation and curettage was found to be associated with age of the study subjects and period of gestation at the time of registration.

The findings of a retrospective cohort study reveals significant association between the maternal haemoglobin level with the APGAR score, intra-uterine foetal death, small for gestational age baby, low birth weight baby¹⁵. The findings of the present study depicts that there was significant association found between birth weight with the type of family and medical history. Small for gestational age was highly associated with age of the subjects, religion, type of family and medical history. Pre-term birth was significantly associated with age of the study subjects. Incidence of low birth weight baby was found to be associated with the age, religion, type of family and medical history.

Conclusion

The chances of a mother having a delivery before term, or even dying are higher among mothers with severe anaemia. As the results of present study shows that the haemoglobin level during pregnancy is significantly associated with the haemoglobin level at the time of delivery and low haemoglobin level at the time of delivery can be linked to many intra-natal and post-natal complications so, steps need to be taken to early diagnose anaemia during pregnancy and manage the same at the earliest so as to improve haemoglobin level before delivery thus reducing life-threatening maternal as well as neonatal complications. Health team members must be trained enough to be vigilant, keen observers and active for the same to bring down the maternal and neonatal morbidity and mortality rates and ratios.

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