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Original Research Article

Analytical study of an iron deficiency anemia during pregnancy at tertiary care center

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ABSTRACT

Background: Anemia is a serious global public health problem affecting both developing and developed countries in reproductive age group. India contributes to about 80% of the maternal deaths due to anemia in south Asia. The objective was to analyse maternal and fetal outcome in anemic pregnant patients as compared to non anemic pregnant patients.
Methods: This analytical study of 100 patients (50 anemic and 50 control groups) was conducted in department of obstetrics and gynecology, at tertiary care hospital, Surat from September 2022 to June 2023.
Results: 56% were booked against 86% in the control group.44% were unbooked against 14% in the control group.66% in cases and 76% in controls were in majority age group of 21-29 years. 68% of the anemic women were multigravida as 50% in the control group.66% of the cases and 34% of the controls belongs to low socioeconomic class. Out of 50 cases of anemia 28% mild, 32% moderate and 40% severe degree. 32% anemic patients were managed with oral iron, 20% with parenteral iron therapy and 48% with blood transfusion. In cases, preeclampsia in 14 patients, preterm in 13 patients, PPH in 4 patients, while in control group 5 patients had preeclampsia, 6 patients had preterm labour and 2 patients had PPH. 1% maternal mortality in cases and zero in control groups.
Conclusions: Antenatal management with correcting prenatal anemic status with dietary advises, prophylactic iron therapy, planned pregnancy with ensuring maternal iron sufficiency during gestation is most effective method.

Keywords: Antenatal visits, Prophylavctic iron therapy, Risk factors

INTRODUCTION

Anemia in pregnancy is a condition of low hemoglobin concentration where hemoglobin has fallen below a threshold level at a two-standard deviation below the median of a healthy population of same age and same stage of pregnancy. It is a statistical definition. It is also defined as decrease oxygen carrying capacity of blood which may be due to decrease in red blood cell (RBC) mass, decrease in hemoglobin concentration or decrease in packed cell volume.

Symptoms

There may be no symptoms, especially in mild and moderate anaemia. Patient may complain of weakness, exhaustion and lassitude, indigestion and loss of appetite. In severe anaemia there is palpitation, dyspnoea, giddiness, edema and rarely anasarca and even congestive cardiac failure can occur in severe cases. There may be symptoms of original conditions causing anaemia like bleeding per rectum.[1]

Signs

Pallor- palm and palpebral conjunctiva, angular stomatitis (erosion, tenderness, swelling at corner of the mouth), glossitis (reddened, swollen, smooth, shiny, tender tongue), thin, lustreless, brittle, flattened nails, koilonychia (spoon shaped nails), edema due to CCF or hypoproteinemia, soft systolic murmur in mitral area due

to hyperdynamic circulation, congestive cardiac failure (basal crepitations).

Investigations for iron deficiency anaemia in pregnancy

The primary objective of these investigations is to determine the degree, type and cause of anaemia. Haemoglobin estimation, peripheral smear, haematological indices like Hb, hematocrit, MCHC, MCV, MCH, PCV, RBC count, serum iron, TIBC, % saturation, serum transferrin, serum ferritin.

Aims and objectives

To study effects of anemia on pregnancy. To correlate associated high-risk factors in anemia in pregnancy. To study diagnosis and management options in anemia in pregnancy. To analyse maternal and fetal outcome in anemic pregnant patients as compared to non anemic pregnant patients. To study various complications in patients of anemia in pregnancy as compared to non anemic pregnant patients.

METHODS

It wass an analytical study done at SMIMER hospital and medical college, Surat during September 2022 to June 2023.

Selection of the patients

In group A- a total 50 cases of anemia in pregnancy were selected, including (antepartum/intrapartum) attending OPD and labour room. Hb% was taken as criteria for deciding anemia cases and to classify them according to severity (WHO classification). Group B- 50 cases of non anemic subjects were included to as control group during the study period and their results were compared with cases of anemia.

All emergency and booked pregnant patients with Hb <11 gm% were included as cases and other pregnant patients having Hb >11gm% were taken as control group. Postpartum patients and non-pregnant patients were excluded.

All study subjects were attended and detailed history regarding demographic data, present obstetrics complaints, and symptoms like breathlessness, chest pain, palpitation, pedal edema or weakness was taken.

Interactive chi-square tests Quantpsy.org software was used for statistical analysis.

RESULTS

In present study 50 cases of anemia in pregnant patients (group-A) and 50 non anemic pregnant patients (group-B) were studied and their results with maternal and fetal outcome were analysed.

Table 1: Booking status wise distribution.

Booking status	Group A cases N (%)	Group B control N (%)
Booked	28 (56)	43 (86)
Unbooked	22 (44)	07 (14)
Total	50 (100)	50 (100)

In our study, booked patient in anemic cases were 56% against 86% non anemic patients. Unbooked patients were 44% in group A against 14% in Group B. This shows that proper antenatal visits and regular follow up is possible in booked cases and helps in treatment of anemia. This study is compared to study of Upadhyay et al showing 53% booked cases in anemia against 47% unbooked cases.[2]

Table 2: Age wise distribution.

Age (years)	Group-A cases N (%)	Group-B control N (%)
<20	8 (16)	6 (12)
21-24	16 (32)	15 (30)
25-29	17 (34)	23 (46)
>30	9 (18)	6 (12)
Total	50 (100)	50 (100)

In case group 66% of study subjects belonged to the age group of 21-29 years, as compared to 76% in control group. 16% of women in cases and 12% of women in control group were belonging to the teenage age group of <20 years. 18% cases and 12% control group were elderly mothers with age >30 years. Our results are comparable to the study of Khan et al showing maximum patients in the age group of 21 to 29 years.[3]

Table 3: Parity wise distribution.

Parity	Group A cases N (%)	Group B control N (%)
Primi	12 (24)	23 (46)
Gravida 2-4	34 (68)	25 (50)
Gravida 5 or more	4 (8)	2 (4)
Total	50 (100)	50 (100)

This table is showing parity distribution of study group. As shown in table and chart in cases there were 24% patients of primi para, 68% patients in between gravida2-4 and 8% patients more than gravida. In control group 50% patients were of gravida two and above as compared to cases 68%. In Kanwar et al were 29.1% cases of primi para, 45% cases of second gravida, 25.9% cases were multigravida.[4]

As shown in Table 4, out of 50 anemic cases, 66% patients were of lower class, 30% patients were of middle class and 4% were of upper class. The cases were categorized as per modified Kuppuswamy's socioeconomic classification. 66% of cases as against only 34% controls belonged to low socioeconomic group, indicating that low SEC, literacy and education play an important role in prevention of

anemia. A study conducted by Thangaleela et al, 42% patients were middle class and 58% patients were of lower class.[5]

Table 4: Socioeconomic status in study group.

Socioeconomic class	Group A anemic cases N (%)	Group B control N (%)
Lower	33 (66)	17 (34)
Middle	15 (30)	2 (46)
Upper	2 (4)	10 (20)
Total	50 (100)	50 (100)

Table 5: Grading (WHO) in cases of anemia (group A).

Severity of anemia	Cases of anemia N (%)	Sarala et al[6]
Mild (10-10.9)	14 (28)	40%
Moderate (7.0-9.9)	16 (32)	55%
Severe (<7)	20 (40)	5%
Total	50 (100)	100%

There were 28% patients of mild anemia, 32% patients of moderate anemia and 40% of severe anemia in present study.

Table 6: Mode of treatment in cases of anemia (group A).

Mode of treatment	Group A cases N (%)
Oral iron	16 (32)
Parenteral iron	10 (20)
Blood transfusion	24 (48)
Total	50 (100)

In anemic cases, 32% patients were given oral iron therapy. 20% patients were given parenteral iron therapy and 48% patients were given blood transfusion.

Table 7: Associated maternal complications (morbidity).

Obstetric condition	Group A cases	Group B control
Preeclampsia	14	5
Preterm labour	13	6
IUGR	3	1
Abruptio placenta	2	1
Postpartum hemorrhage	4	2
Puerperal sepsis	1	-
Lactation failure	1	-

The most common maternal complication seen in anemic cases was preeclampia in 14 patients as against only 5 in the non anemic group. 13 anemic cases had preterm labour as against only 6 in the control group. 3 cases of anemia had IUGR, 2 cases of anemia had abruptio placenta, 4 cases had PPH, 1 had puerperal sepsis and 1 had lactational failure. This study is comparable to study conducted by Yadav et al.[7]

Table 8: Maternal outcome.

Maternal outcome	Group A cases N (%)	Group B control N (%)
Preterm labour	13 (26)	6 (12)
Term labour	33 (66)	42 (84)
Post term labour	4 (8)	2 (4)
Total	50 (100)	50 (100)

In the cases, out of 50 women who delivered, 66% had term delivery and 26% of patients had preterm labour, 8% had post term labour. In the control group 84% of patients had term labour 12% had preterm labour and 4% had post term labour. This table shows that the incidence of preterm labour is high in anemic cases.

Table 9: Mode of delivery.

Mode of delivery	Group A cases N (%)	Group B control N (%)
Vaginal	30 (60)	36 (72)
LSCS	20 (40)	11 (22)
Assisted vaginal	00	3 (6)
Total	50 (100)	50 (100)

In group A, anemic cases, vaginal delivery was seen in 60% as compared to group B, control group, showing 72%. 40% in the anemic group underwent LSCS as against only 22% in the control group. 6% in the control group had instrumental vaginal delivery. In Upadhyay et al, 65.5% had vaginal delivery, 34.5% had LSCS.[2]

Table 10: Fetal outcome in anemia.

Fetal outcome	Group A cases	Group B control
Preterm babies	13	6
Low birth weight	11	4
Low APGAR score	14	5
Fetal growth restriction	3	1
Intra uterine death	1	1
Still birth	1	-
NICU admissions	13	5
Early neonatal death	1	1

13 babies in anemic group were preterm as against only 6 in the control group. 11 babies in anemic group had low birth weight as against only 4 in the control group. 14 babies in anemic group and 5 in the control group had low APGAR score. 3 babies in anemic group and 1 in the control group had FGR.NICU admission in anemic cases were 13 as compared to 5 in the control group. Still birth and neonatal death were 2 in anemic group against 1 in control group.

Table 11: Maternal and perinatal mortality.

Maternal and perinatal mortality	Group A	Group B
Maternal death	1	0
Perinatal death	2	0

In anemic cases, 1 maternal death occurred due to severe preeclampsia associated with HELLP syndrome. Perinatal mortality in our study was 2% inspite of adequate NICU care. In control group there was no maternal and perinatal mortality.

DISCUSSION

56% were booked as against 86% in the control group.44% were unbooked as against only 14% in the control group. This study is compared to study of chintan Upadhyay et al showing 53% booked cases in anemia against 47% unbooked cases.[2] Majority of the study subjects were in age group of 21-29 years, 66% in the cases and 76% in the controls. This study is comparable to the study of Khan et al showing maximum patients in the age group of 21 to 29 years.[3] 68% of the anemic women were multigravida as compared to 50% in the control group. In Kanwar et al were 29.1% cases of primi para, 45% cases of second gravida, 25.9% cases were multigravida.[4] 66% of the cases and 34% of the controls belongs to low socioeconomic class. This is comparable to a study conducted by Thangaleela et al, 42% patients were middle class and 58% patients were of lower class.[5] Out of 50 cases of anemia 28% were mildly anemic, 32% moderately anemic and 40% were severely anemic. This study is comparable to Sarala et al.[6] 32% anemic patients were managed with oral iron, 20% with parenteral iron therapy and 48% with blood transfusion. The most common complication during the antenatal period in anemic cases was preeclampsia in 14 patients, preterm in 13 patients, PPH in 4 patients, while in control group only 5 patients had preeclampsia, 6 patients had preterm labour and 2 patients had PPH. This study is comparable to study conducted by Yadav et al.[7]

72% of the controls and 60% of the cases had normal vaginal delivery. 40% of cases and 22% of control group had LSCS. This is comparable to Upadhyay et al, 65.5% had vaginal delivery, 34.5% had LSCS.[2] 13 cases had preterm babies, 11 had LBW as against 6 and 4 in control group. Maternal mortality among cases was 1% and no case of maternal mortality in control group was noted. Perinatal mortality in anemic group was 2% as against no cases of mortality in control group.

Major limitations of this study are mother's status of anemia could not be traced at different trimester of pregnancy because of short duration of study period. No test was done to find out any infectious disease like hookworm infestation to serve as etiology behind anemia.

CONCLUSION

Anemia is not only a medical problem, but is a global public health problem. In developing countries anemia is playing major role in maternal and perinatal morbidity as well as mortality. Among various causes of anemia 90% are of nutritional in origin, iron deficiency being commonest. The high prevalence of iron and other micronutrient deficiencies among women before and during pregnancy is of concern. So proper counselling during pregnancy and following antenatal protocols for management should be strictly implemented. Antenatal management with correcting prenatal anemic status with dietary advises and prophylactic iron therapy, planned pregnancy with ensuring maternal iron sufficiency during gestation is most effective method of preventing maternal and perinatal morbidity in our country.

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