Original Research Article

Study of Maternal and Perinatal Outcome in Pregnancy with Anemia

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Abstract

Background: Anaemia is an important risk factor in pregnancy. Anaemia in pregnancy is associated with an increased incidence of both maternal and foetal morbidity and mortality**. Aim& Objective:** The main aim of the present is to know the impact of anaemia on maternal and perinatal outcome. **Methodology:** The study was conducted at Govt Medical College & Hospital, Nalgonda during the period of September 2019 to August 2020. It was a prospective study, 300 antenatal women in the third trimester were included in this study. **Results:** Majority of study subjects were in the age group of 21-30 years-72.7%. Majority of anaemic women 64% belonged to low socio-economic status. Majority of anaemic women were school level educated- 64%. Majority of anaemic antenatal women were from rural area- 76.7%. Majority of anaemic antenatal women 61% were unbooked. 50% of the anaemic women were asymptomatic. Among 50% of symptomatic women most common presenting symptom was weakness and easy fatiguability. Only 6.3% of anaemic women gave history of increased menstrual flow. 61.7% of antenatal women were multigravida. Antenatal women with less inter pregnancy interval (< 2 years) were 67.6%. 65.3% anaemic women had calorie intake of less than 80% of normal diet. 17.3% women had not taken iron prophylaxis and 45.7% had taken inadequately during present pregnancy. Out of 300 anaemic cases, 46% were mildly anaemic, 50% moderate and 4% severely anaemic. The mean PCV, MCV, MCH, MCHC and RBC count was reduced in anaemic patients indicating that iron deficiency is the commonest type of anaemia in pregnancy. Microcytic hypochromic anemia was the commonest type of anaemia (59.7%) followed by normocytic normochromic anaemia (38.3%) on peripheral blood picture. Out of 300 anaemic women, 22% received blood transfusion during antenatal / intranatal / postnatal period. The most common associated complications during antenatal period was pregnancy induced hypertension (12.3%), thyroid disorders (10.7%) and antepartum haemorrhage (7%). 32% fetuses were preterm and premature. The major neonatal morbidities in present study were low birth weight, respiratory distress syndrome and neonatal jaundice. The perinatal mortality was 13.8% in present study. The most common maternal morbidity was puerperal pyrexia and puerperal sepsis 9.7%. There were no maternal deaths in present study. **Conclusion:** Iron deficiency anaemia is the commonest problem in pregnancy. In the present study low socio-economic status, inadequate antenatal care, poor nutrition, multiparity, close birth spacing were the risk factors for anaemia in pregnancy.

Keywords: Anaemia, RBC, Maternal, Preterm, Microcytic Hypocromicanaemia.

Introduction

Anaemia has been known since ancient times. An early description of the disease appears in Papyrus Ebers, a therapeutic manual form 1500BC.Estimates from the World Health Organization report that from 35% to 75% (56% on average) of pregnant women in developing countries, and 18% of women from industrialized countries are anemic[1].WHO has recognized as a global problem with serious consequences for mothers and their babies[2].Anaemia is the most common nutritional deficiency disorder in the world. WHO has estimated that prevalence of anaemia in pregnant women in developed and developing countries is 14 per cent in developed and 51 per cent respectively and 65-75 per cent in India[3].Anaemia gets aggravated by increased requirements during adolescence and during Pregnancy[4].Assuming that the absorption of iron is 8 per cent in pregnant women, their average dietary intake will meet only 30-45 per cent of the requirement. Interstate differences in iron intake are of small magnitude. The low dietary intake of iron, folic acid and food stuffs that promote iron absorption, coupled with poor bioavailability of iron are the major factor responsible for very high prevalence of anaemia in our country[5,6]

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In India, the prevalence of anaemia is high because of (i) low dietary intake, poor iron (less than 20 mg /day) and folic acid intake (less than 70 mg/day); (ii) poor bioavailability of iron (3-4% only) in phytate and fiber-rich Indian diet; and (iii) chronic blood loss due to infection such as malaria and hookworm infestations.Anaemia is an important risk factor in pregnancy. Anaemia in pregnancy is associated with an increased incidence of both maternal and foetal morbidity and mortality. Reports from India indicate that 16% of all maternal deaths are attributable to anaemia[7].In early pregnancy haemoglobin concentration drops as plasma volume expansion out spaces expansion of the red cell mass, while in late pregnancy, plasma volume ceases to expand and haemoglobin concentration rises if iron stores are adequate. Thus the relation of haemoglobin concentration to birth outcome will probably depend on when the haemoglobin is measured, Maternal anaemia in pregnancy is commonly considered as risk factor for poor pregnancy outcome and can threaten the life of mother and foetus. Studies have shown a strong association between low maternal haemoglobin levels before delivery and adverse foetal outcome[8]

Aims and Objectives

- To study the severity and impact of anaemia complicating pregnancy on maternal outcome.
- To study the perinatal outcome in pregnancy with anaemia.

Methodology

- The study was done on 300 antenatal women with Hb% <10.9g/dl coming to department of Obstetrics &Gynaecology, Govt Medical College & Hospital, Telangana state.
- Relevant history was taken. They were subjected to general examination, per abdomen, per vaginal examination and ultrasonography.
- They were subjected to investigations like: Complete blood picture (CBP), Haemoglobin %, Haematocrit, Blood grouping Rh typing, Peripheral smear, Random blood sugar (RBS), Serum creatinine, Blood urea & complete urine examination (CUE),Hepatitis B Antigen(HBsAg), Human immuno deficiency virus (HIV).
- Patients were also subjected to other tests when necessary depending on the complications such as: Serum uric acid, LDH, Liver function tests (LFT), Coagulation profile.
- They were followed until delivery to know the fetal outcome along with maternal health status.
- These patients were managed along the lines of severity of anaemia and their period of gestation.
- Patients presenting with pregnancy induced hypertension (PIH) were managed according to individual needs. They were given bed rest, sedatives and antihypertensives.
- Patients presenting with preterm labour were admitted and managed by provision of bed rest, tocolytics and corticosteroids till 34 weeks of gestation. Once the condition was settled, the patients were discharged with specific advice to come for regular weekly checkups.
- Once the patients goes into the labour, they were reviewed with the help of NST and pelvis was assessed. The course of labour was monitored according to Friedmansparto graph. The progress of labour was assessed periodically by abdominal and vaginal examinations in which the following parameters were noted.

✓ The general condition of the patient: hydration, temperature, pulse rate, blood pressure, respiration.
✓ Uterine activity
✓ Station & descent of the fetal head
✓ Cervical effacement and dilatation
✓ Colour of the liquor
✓ Evidence of any caput and moulding

- Bishops score was analyzed. Instrumental or Caesarean section was done whenever indicated. Episiotomy was performed. The neonatologist assessed each baby soon after the delivery. APGAR score was recorded at one minute and five minute.

After delivery of the baby, signs of placental separation was observed and placenta was delivered by Brandt-Andrews technique. Any complications found were treated aggressively. Both mother and baby were observed in the postnatal period for any complications. Primigravida were counseled about contraceptives and the importance of spacing.The observations were computed, compared and analyzed by frequency distribution tables.

Inclusion Criteria

All pregnant women with Hb% <10.9gm/dl and >28weeks of gestational age with nutritional anaemia were included in this study.

Exclusion Criteria

- All pregnant women <28wks of gestational age with Hb% ≥11g/dl.
- All haemolyticanaemias
- Twin gestation

Heart disease complicating pregnancy

Observations and Results

Table 1: Distribution According to Age

Age (years)	N=300	%
≤20	64	21.3
21-25	165	55
26-30	53	17.7
>30	18	6
Total	300	100

Table 1 shows about age distribution of the study, 64 (21.3%) were in less than 20 years of age, 165 (55%) were in between 21-25 years of age group, 53 (17.7%) were in between 26-30 years of age group, 18 (6%) were in more than 30 years of age group.

Table 2: Distribution of Study Subjects According To Socio

Socio economic status	N=300	%
Upper	2	0.7
Upper middle	3	1
Upper Lower	33	11
Lower middle	70	23.3
Lower	192	64
Total	300	100

Table 2 show that 2 (0.7%) women were from to upper socio economic status, 3 (1%) women from upper middle, 33 (11%) women from upper lower, 70 (23.3%) women were from lower middle, 192 (64%) women were lower socio economic status.

Table 3: Distribution As Per Educational Status

Educational status	N=300	%
Illiterate	75	25
School level	192	64
PUC/Degree	33	11
Total	300	100

The above Table 3 shows that 75 (25%) women were illiterate, 192 (64%) were school level, 33 (11%) were PUC/ Degree level education

Table 4: Geographical Distribution of Study Subjects

Category	N=300	%
Rural	227	76.7
Urban	73	24.3
Total	300	100

The above Table 4 depicts geographical distribution, in which 227 (76.7%) antenatal women were from rural area and 73 (24.3%) were from urban area.

Table 5: Distribution In Relation To Availed Antenatal Care

Category	N=300	%
Booked	117	39
Unbooked	183	61
Total	300	100

The above Tabl 5 shows that 117 (39%) antenatal women were booked and 183(61%) were unbooked cases.

Table 6: Symptom Analysis of Anaemia

Symptoms	N=300	%
Asymptomatic	150	50
Weakness/Fatigue	99	33
Dyspnea	18	6
Palpitation	6	2
Pedal edema	45	15
Fever	6	2
UTI	18	6

The above Table 6 depict anaemia symptoms, in which 150 (50%) women were asymptomatic, 99 (33%) were complaining of weakness & easy fatiguability, 18 (6%) had dyspnea, 6 (2%) had palpitation, 45 (15%) had pedal edema, 6 (2%) had with fever, 18 (6%) came urinary tract infections.

Table 7: Distribution According to Menstrual History

Menstrual history	N=300	%
Normal	281	93.7
Increased flow	19	6.3
Total	300	100

The above Table 7 depict menstrual history of anaemic antenatal cases, 281 (93.7%) were with normal flow and 19 (6.3%) were with increased menstrual flow.

Table 8: Distribution According to Gravida

Gravida	N=300	%
Primigravida	115	38.3
Multigravida	185	61.7
Total	300	100

As shown in Table 8, 115 (38.3%) antenatal women were primi and 185 (61.7%) were multigravida.

Table 9: Distribution of Past Obstetric History in Multigravida

Past Obstetric History	N=185	%
Abortion	29	15.7
Hysterotomy	2	1.1
IUDS	8	4.3
Vaginal deliveries	62	33.5
LSCS	84	45.4
Total	185	100

As shown in Table 9, 29 (15.7%) patients had abortion, 2 (1.1%) underwent hysterotomy, 8 (4.3%) had intra uterine death, 62 (33.5%) had vaginal deliveries, 84 (45.4%) underwent LSCS in previous pregnancy.

Table 10: Birth Spacing in Multigravida

Birth Spacing	N=185	%
<2 years	125	67.6
≥2 years	60	32.4
Total	185	100

The above Table 10 show that 125 (67.6%) cases had birth spacing interval of less than 2 years and 60 (32.4%) cases had more than 2 years.

Table 11: Distribution of Study Subjects according to Calorie Intake

Calorie Intake	N=300	%
≤80%	196	65.3
>80%	104	34.7
Total	300	100

The recommended daily calorie intake for an average women in pregnancy is 2420 Kcal/day. Any woman whose calorie intake is less than 1920 Kcal/day is taken as less than 80% of the expected. In above Table 11, 196 (65.3%) of cases had calorie intake of less than 80% of expected and 104 (34.7%) of cases had more than 80% of intake.

Table 12: Prophylactic Iron Intake in the Present Pregnancy

Iron intake	N=300	%
Nil	52	17.3
Not adequate	137	45.7
Adequate	111	37
Total	300	100

In above Table 12, 52 (17.3%) women did not take Iron prophylaxis during present pregnancy, 137 (45.7%) women were not taking iron adequately whereas 111 (37%) women were taking adequate Iron prophylaxis.

Table 13: Distribution of Severity of Anaemia in Study Subjects

Severity	N=300	%
Mild	138	46
Moderate	150	50
Severe	12	4
Total	300	100

Above Table 13, showing the severity of anaemia in present study, in which 138 (46%) women had mild anaemia, 150 (50%) women had moderate and 12 (4%) women were severely anaemic.

Table 14: Relationship of Grade of Anaemia With Mean of Different Blood Parameters

Blood parameters(mean)	Mild N=138	Moderate N=150	Severe N=12
Hb	10.34	9.07	6.3
PCV	32.6	27.9	17.3
RBC	4.1	3.6	2.1
MCV	84.6	77.5	57.4
MCH	27	21.9	16.9
MCHC	29.7	26.7	25

The above Table 14 shows that

- The mean Hb% in mild anaemia cases is 10.34% g/dl, in moderate anaemic cases 9.07% g/dl and in severe anaemia cases- 6.3.
- The mean PCV in mild anaemia is 32.6, 27.9 in moderate and 17.3 in severe anaemic group.
- The mean RBC count in mild anaemia is 4.1million/cu.mm, 3.6million/cu.mm in moderate and 2.1million/cu.mm in severely anaemia cases.
- The mean MCV, MCH and MCHC are all indicating that iron deficiency is the reason for anaemia.

Table 15: Type of Anaemia Based on Peripheral Smear

Type of blood picture	N=300	%
Microcytic hypochromic	179	59.7
Normocytic normochromic	115	38.3
Macrocytic	3	1
Dimorphic	3	1
Total	300	100

The above table 15,show peripheral smear picture of anaemic women, in which 179 (59.7%) women had microcytic hypochromic anaemia, 115 (38.3%) women had normocytic normochromic anaemia, 3 (1%) were macrocytic and 3 (1%) were dimorphic anaemia.

Table 16: The Mode of Correction of Anaemia

Mode of correction	No of cases	%
Oral therapy	180	60
Parenteral therapy	54	18
Blood transfusion	66	22
Total	300	100

In above Table 16, anaemia was corrected by oral therapy in 180(60%) women, parenteral therapy in 54(18%), blood transfusion in 66(22%) antenatal women during antepartum, intrapartum and postpartum period.

Table 17: Complications During Antenatal Period

Maternal complications	No of cases	%
Hypertensive disorders in pregnancy	37	12.3
APH	21	7
PPROM/PROM	18	6
Hypo/Hyperthyroidism	32	10.7
Fever	6	2
DM	2	0.7
ITP	1	0.3
Bronchial asthma	4	1.3
Epilepsy	1	0.3
Jaundice	3	1

The most common complication in this study was hypertensive disorders in pregnancy 37(12.3%) cases followed by 32(10.7%) thyroid disorders, 21(7%) antepartum haemorrhage, 18(6%) PPROM/PROM, 6(2%) fever, bronchial asthma 4(1.3%), jaundice 3(1%), DM 2(0.7%), ITP 1(0.3%), epilepsy 1(0.3%) cases.

Table 18:Fetal Complications in The Study Subjects

Fetal complications	No of cases	%
Prematurity	96	32
IUGR	15	5
Oligohydramnios	29	9.7
Polyhydramnios	1	0.3
Congenital anomalies	2	0.7

The most common fetal complication in pregnancy with anaemia was prematurity 96(32%) cases followed by oligohydramnios 29(9.7%) cases, IUGR 15 (5%), congenital anomalies 2 (0.7%), polyhydramnios 1(0.3%) cases.

Table 19: Distribution of Gestational Age at Delivery

Delivery outcome	N=300	%
Preterm	96	32
term	204	68
Postterm	0	0
Total	100	100

The above Table 19 show, 204(68%) women had term delivery and 96(32%) had preterm delivery.

Table 20: Mode of Delivery in The Study Subjects

Mode of delivery	N=300	%
Vaginal	117	39
Instrumental	3	1
LSCS – Elective	58	19.4
Emergency	121	40.3
Laparotomy	1	0.3
Total	300	100

The above Table 20 show, 117(39%) vaginal deliveries, 3(1%) instrumental deliveries, 58(19.4%) elective LSCS, 121(40.3%) emergency LSCS, 1(0.3) laparotomy cases.

Table 21: Complications of The Labor

Labor complications	N=300	%
Congestive cardiac failure/Pulmonary edema	2	0.7
PPH	7	2.3
Retained placenta	2	0.7
Rupture uterus	1	0.3

Above Table 21 show labor complications like congestive cardiac failure & pulmonary edema 2(0.7%), postpartum haemorrhage 7(2.3%), retained placenta 2(0.7%), rupture uterus 1(0.3%).

Table 22: Indication For Lscs in The Study Subjects

Indication	N=179	%
Previous LSCS	90	50.3
Fetal distress+ Abnormal NST	28	15.6
CPD+CP	14	7.8
Mal presentation /Malposition	13	7.3
Antepartum haemorrhage	14	7.8
Abnormal labor/cervical dystocia	8	4.5
IUGR/ Abnormal doppler	8	4.5
Others(HPV,HSV,Hysterotomy2)	4	2.2

The most common indication for LSCS in this study was previous LSCS 90(50.3%) followed by 28(15.6%) fetal distress & Abnormal NST, 14(7.8%) CPD/CP,13(7.3%)malpresentation/position, 14(7.8%) antepartum haemorrhage, 8(4.5%) abnormal labour& cervical dysticia, 8(4.5%) were IUGR & Abnormal Doppler, 2(2.2%) were others.

Table 23: Perinatal Outcome In The Study Subjects

Perinatal outcome	N=300	%
IUD	21	7
Still birth	5	1.7
Alive	274	91.3
Total	300	100

As shown above Table 23, there were 21(7%) intra uterine deaths, 5(1.7%) still births, 274(91.3%) live births.

Table 24: Analysis of Apgar Score

APGAR	At 1min	%	At 5 min	%
<7	134	48.9	33	12
≥7	140	51.1	241	88
Total	274	100	274	100

There were total of 274 newborn babies of women with anaemia including IUD & still births. Those with APGAR <7 at 1 minute were 134(48.9%), at 5 minute were 33(12%) and those with APGAR ≥7 at 1 minute were 140(51.1%), at 5 minute were 241(88%).

Table 25: Distribution of Birth Weight In Babies Born To Women With Anaemia

Birth weight in kgs	N=300	%
<1	10	3.3
1-1.99	57	19
2-2.99	152	50.7
≥3	81	27
Total	300	100

Majority of babies had born with birth weight of 2- 2.99kgs that is 152(50.7%), followed by 81 (27%) cases were ≥3kgs, 57(19%) were between 1- 1.99kgs and 10(3.3%) were <1kg.

Table 26:NICU Admissions

NICU admission	N=274	%
No admission	188	68.6
Admission	86	31.4
Total	274	100

As shown in above Table 26 , out of 274 babies 86(31.4%) were admitted in NICU.

Table 27: Neonatal Morbidity In The Study Subjects

Neonatal morbidity	No. of cases	%
Low birth weight	74	27
Birth asphyxia	11	4
Respiratory distress syndrome	35	12.8
Meconium aspiration syndrome	4	1.5
Hypoglycemia	2	0.7
Neonatal jaundice	31	11.3
Neonatal sepsis	2	0.7
Early neonatal deaths	14	5.1

The above Table 27 depict 74(27%) babies had low birth weight, 11(4%) birth asphyxia, 35(12.8%) respiratory distress syndrome, 4(1.5%) meconium aspiration syndrome, 2(0.7%) hypoglycemia, 31(11.3%) neonatal jaundice, , 2(0.7%) neonatal sepsis, 14(5.1%) early neonatal deaths..

Table 28: Postpartum Morbidity In The Study Subjects

Postpartum morbidity	No of cases	%
Failed lactation	9	3
Wound dehiscence	14	4.7
P.pyrexia/P.sepsis	29	9.7

As shown above Table 28, 9(3%) women had failed lactation, 14(4.7%) had Wound-dehiscence, 29(9.7%) suffered with puerperal pyrexia and puerperal sepsis.

Discussion

In this present study, 300 anaemic pregnant women were included. The present study is aimed at analyzing the impact of anaemia on pregnancy.

Age Distribution In Various Studies

In the present study, majority (72.7%) of anaemic antenatal women belonged to the age group of 21-30 years, these findings were comparable with studies conducted by Suryanarayana R et al (66%) and Francis S et al[10] (92%).Although majority women were belonged to 21-30 years in present study, significant number of women (21.3%) were below 20 years which was similar to study conducted by Suryanarayana R et al[9](33%).In contrast to present study, significant number of women were above 30 years (34%) in Tyagi S et al study[11]. In present study, least number of women belonged to the age more than 30 years (6%) which was similar to Francis S et al (5%), Rama G et al[12](2.7%) studies. In contrast, Suryanarayana R et al[9] (0.09%) had very less number women > 30 years.Most of the patients are from rural background, hence early marriages and early pregnancies. In present study, hence more prevalence of anaemia in youger women. This could be attributed to the poor nutrition and iron intake as compared to the demands of the growing age through diet resulting in iron deficiency.

Socio-Economic Status

Low socio-economic status leads to poor nutrition and is a risk factor for anaemia. In the present study, majority of antenatal women belonged to lower socio-economic status that is 64% followed by lower middle class 23.3% and least from upper class 0.7%.These findings were similar to study conducted by Ivon EA et al[13], where the lower class women were 38 %, no one from upper socio economic class. Similarly according to Sangeeta VB et al[14], 41% women belonged to lower socio economic class, no one from upper class.In contrast to present study, majority of women belonged to lower middle class (32.06%) in Bedi R et al study.

In the present study, majority of the antenatal women who were from very low socio-economic status were uneducated and ignorant. They were unaware of the risk involved in pregnancy with anaemia and its consequences. Consequently they visit a doctor only after landing up with complications. Poor income leads to limited access to nutritious diets and associated poor eating habits which might lead to anaemia.

Educational Status

In the present study it was observed that anaemia was more common among the school level educated women (64%) followed by illiterate women 25% which was comparable with study conducted by Bedi R et al[13]where 44.62% women were school level educated and 44.12% were uneducated.However, in contrast to present study in Suryanarayana et al[8], 38.7% women were illiterate followed by 33.2% of graduates & post graduates and 28.1% of school level educated.

Geographical Parameters

In the present study, majority of antenatal women were from rural area- 75.7% and only 24.3% were from urban area. similarly, in following studies majority of women were from rural area- Francis S et al[10] - 71%, Bedi R et al - 57.59%, Kora DV -75% and Khan S[17] - 73.33%.

Antenatal Care Availed By Anaemic Women

In the present study, booked cases were 39% and unbooked were 61% which was comparable with the study conducted by, Megha TS[18] and Singal N et al[19]. In each of these studies 42% antenatal women were booked cases and 58% were unbooked.In following studies unbooked cases were much more than present study. Nisty RM et al[20] study showed that 76% were unbooked, Khan S[17] - 87.66% and Ghimire RH et al[21]- 98%.

Symptom Analysis Of Anaemia

In the present study, 50% of anaemic women were asymptomatic. The most common symptom of presentation was easy fatiguability and weakness in 33% cases followed by dyspnea & palpitation in 8%, pedal edema in 15%, fever in 2% and urinary tract infection in 6% cases.In a study conducted by Singal N et al[19] asymptomatic women were 15%, easy fatiguability& weakness in 75%, Dyspnea &

palpitation in 37%, pedal edema in 20%, fever in 1.5% and urinary tract infections in 1.5% cases.

Menstrual Cycle in Different Studies

In the present study, 93.7% women had normal menstrual cycle and only 6.3% had increased flow which is comparable with Singal N et al[19] study, where 80.5% women had normal menstrual cycle and 19.5% had increased flow.Present study is a contrast to Obse N et al[22], where only 29.1% women had normal menstrual flow, 19.6% had irregular menstrual cycle and 45.9% women had increased flow.

Parity/Gravida Distribution in Different Studies

In the present study, anaemia was more common in multigravida accounting for 61.7% which was comparable with below studies-According to Omosh RK et al[23] – 63%,.

Past Obstetric History

In the present study, the obstetric outcome in past pregnancy was as follows-intra uterine deaths in 4.3% cases, abortions in 15.7%, cesarean sections in 45.4%, vaginal deliveries in 33.5% and hysterotomy in 1.1% cases.In a study conducted by Kora DV[16], intra uterine deaths were 8.06%, abortions 27.41%, LSCS in 19.35% cases.

Birth Spacing

Close birth spacing had an impact on the haemoglobin status of an antenatal women.In the present study, 67.6% had birth spacing < 2years, these observations were comparable with study conducted by Khan S[17] – 61.4%, Manharlal UC[24]– 61.2%, Obse N et al[22] - 48%.

Calorie Intake

Low calorie intake of <80% of the normal is a major factor for nutritional anaemia. In the present study, low calorie intake <80% was seen in 65.3% of antenatal women.Minerals (iron, Cu^{+}), proteins and vitamins like B_6, B_{12} are required for thehaemoglobin synthesis. Low calorie intake causes mineral, protein and vitamin deficiency which leads to nutritional anaemia.

Prophylactic Iron Intake

In the present study, during antenatal period 17.3% women had not taken iron prophylaxis. However in study conducted by Bedi R et al(27.44%), Singal N et al (29%) - number of women not taken iron prophylaxis was more compare to present study[19]

Severity of Anaemia

In the present study, majority of antenatal women were moderately anaemic (50%), this was similar to studies conducted by Manharlal UC[24] (53%).In contrast, study by Vemulapalli B (52.73%) showed that majority were mildly anaemic. However, prevalence rate of mild anaemia in present study was (46%) similar to study by Vemulapalli B[25]. in other studies prevalence was less.

Type Of Anaemia in Different Studies

Peripheral smear examination tells us about the type of anaemia and plays a role in the management. Microcytic hypochromic anaemia is suggestive of iron deficiency anaemia and macrocytic anaemia is folate and vitamin B12 deficiency anaemia.In present study majority of antenatal women had microcytic hypochromic anaemia – 59.7%, which was similar to study by Bukar M et al[26] (64.9%).

Correction Of Anaemia

In the present study antenatal women with anaemia were treated with oral iron therapy in 60%, parenteral therapy in 18% and blood transfusion in 22% women during antepartum, intrapartum and postpartum period.

Maternal Complications in Different Studies

In the present study the major maternal complication during antenatal period was pregnancy induced hypertension in (12.3%), which was similar to study by Suchitra R et al[27] (9.3%). However prevalence of pregnancy induced hypertension was not comparable to studies conducted by Manharlal UC[24] (3%), Ghimire RH et al[21] (36%).

Next common complication was thyroid disorders in pregnancy (10.7%), which was higher than Manharlal UC[24] (2.5%) study.

Fetal Complications in Different Studies

In the present study, 32% fetuses were born premature which was comparable to study by Sangeeta VB et al[32] (38%).

Delivery Outcome

The incidence of preterm delivery in present study was 32% which was comparable with Ashwini MN et al[28]study that is 36%.

However, prevalence of preterm deliveries was more according to Sangeeta VB et al (60.3%), compared to present study[14]

Mode of Delivery

In the present study, 39% anaemic women had vaginal delivery, 1% had instrumental delivery and 59.7% women underwent lower segment cesarean section. Out of this 19.4% had elective caesarean sections and 40.3% had emergency caesarean sections. The cesarean section rate was comparable with study conducted by Suryanarayana R et al study, which was 66%.

Complications Of Labor

In the present study, the incidence of PPH was 2.3% which was similar to studies conducted by Kora DV[16] (6%). These finding were not comparable with studies conducted by Ashwin MN et al[28] (14.5%).

Indication ForLscs

In the present study, the most common indication for cesarean section was previous LSCS (50.3%) which is higher than study conducted by Megha TS (14%) and Kora DV[16] (10.2%).

Perinatal Outcome

In the present study, the intra uterine deaths were 7% which was comparable to studies by Ghimire RH et al[21](6%), Sangeeta VB et al[14] (4%), Manharlal UC[24]

Comparison of Apgar Score

In the present study, the APGAR score <7 at 1minute was 48.9% which was higher than study conducted by Yousuf F et al study[29]. The present study shows that there is an association of low APGAR score with maternal anaemia.

Comparison of Birth Weight

In present study, the prevalence of low birth weight <2.5 kgs was 35.6% which was more than study by Megha TS[18] (22%) and lesser than studies conducted by Ahmod MO et al[30](64%).

Nicu Admission

In the present study, 31.4% neonates were admitted in NICU for various reasons which was comparable with Rani KU et al

Neonatal Morbidity In Different Studies

The prevalence of admission to NICU for low birth weight in present study was 27% which was comparable with Anjanappa B et al[31] (21%) study. Most of the babies were admitted to NICU due to complications of prematurity.

Perinatal Mortality

In the present study, the perinatal mortality (13.7%) was higher with studies conducted by Kidanto HL et al (4.16%). This may be because of higher prevalence of prematurity and its complications[32]

Postpartum Morbidity

In the present study, the most common complications occurring in postpartum period were puerperal pyrexia and puerperal sepsis -9.7% which was similar to Suchitra R et al(9.64%), Kora DV[16](3.3%), Megha TS(5%).This shows that maternal anaemia is associated with prevalence of puerperal pyrexia & sepsis. Although anaemia is a known direct and indirect cause of maternal mortality, there was no maternal mortality due to anaemia in the present study. This could be due to prompt treatment of severe anaemia by blood transfusion and early recognition and prompt management of complications of severe anaemia like cardiac failure or pulmonary edema in intensive care unit with the help of physician.

Conclusion

Iron deficiency anaemia is the commonest problem in pregnancy. In the present study low socio-economic status, inadequate antenatal care, poor nutrition, multiparity, close birth spacing were the risk factors for anaemia in pregnancy. The results show the association of maternal anaemia with pregnancy induced hypertension, thyroid disorders, antepartum haemorrhage, pretermlabour and postpartum

morbidity. There is increased risk of prematurity, IUGR, low birth weight, low APGAR at 1min, perinatal morbidity and mortality. So, there is definite impact of anaemia on maternal and perinatal outcome.Proper antenatal care is the basic requirement for prevention, early detection and treatment of anaemia. Routine iron supplementation should be given during pregnancy and postpartum to cover losses during delivery and lactation. Maternal education increases the awareness of mother regarding nutrition, contraception, birth spacing and compliance to medical advice. Joint social and medical efforts are required for overall improvement of living status of women.

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