

THE IMPACT OF MATERNAL ANAEMIA ON FOETAL OUTCOME

Vijay N. Gadhavi¹, Mansi Ketan Gadhavi², Mehu³, Bipin Shah⁴

¹Assistant Professor, Department of Obstetrics and Gynaecology, C. U. Shah Medical College and Research Centre, Surendranagar, Gujarat.

²Assistant Professor, Department of Obstetrics and Gynaecology, C. U. Shah Medical College and Research Centre, Surendranagar, Gujarat.

³Second Year Resident, Department of Obstetrics and Gynaecology, C. U. Shah Medical College and Research Centre, Surendranagar, Gujarat.

⁴HOD, Department of Obstetrics and Gynaecology, C. U. Shah Medical College and Research Centre, Surendranagar, Gujarat.

ABSTRACT

BACKGROUND

In 1993, the World Bank ranked anaemia as the 8th leading cause of disease in girls and women in the developing world. Apart from maternal morbidity and mortality, neonatal mortality is high among the babies of anaemic mothers. Pregnant women are particularly considered to be the most vulnerable group because of the additional demands that are made on maternal stores.

Objectives of the study are- 1) To study effects and benefits of interventions offered to patients. 2) To study the outcome of foetus in pregnant patients suffering from anaemia. 3) To screen and diagnose all the patients suffering from anaemia and give them appropriate treatment for the same and further prevention in context to public health. 4) To find out the underlying causes and factors associated with anaemia and assess the awareness in the patients regarding these causes.

MATERIALS AND METHODS

This study involved total of 300 antenatal anaemic booked patients in group A treated with haematinics, iron sucrose injections and folic acid supplementation. Group B contains unbooked patients who came to emergency department, corrected their anaemia level with blood transfusion.

RESULTS

Booked patients detected early to be anaemic and treated with inj. iron sucrose and inj. Vit B12 and folic acid have better prognosis with better foetal and maternal outcome. Patients who came to the emergency department and who were given blood transfusion to combat anaemia had maximum preterm labour, eclampsia, PPH and sepsis.

CONCLUSION

The results show early detection and correction of anaemia with iron sucrose and oral haematinics lead to better prognosis in many aspects in regard to foetomaternal health compared to group of patients who are not registered, treated with blood transfusion to correct their anaemia status. One of the causes observed for early labour or pre-term labour, low birth baby, poor Apgar score was when blood transfusion was given to unregistered patients with poor Hb% level as an emergency in this study.

KEYWORDS

Anaemia, Preterm Birth, Puerperal Sepsis, Post-Partum Haemorrhage, Low Apgar Score.

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BACKGROUND

According to United Nation declaration 1997, anaemia is a major public health problem that needs total elimination. It estimated that around 2 billion people, 30% of the world population are affected, with the majority coming from the developing world.¹ Globally, anaemia has been found to be the most common complication in pregnancy. The World

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Corresponding Author:

Dr. Vijay N. Gadhavi,

Opp. Chhabila Hanuman,

Surendranagar- 363001, Gujarat.

E-mail: drvijaygadgadhavi@gmail.com

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Health Organization (WHO) estimates that more than 40% of non-pregnant and over 50% of pregnant women in developing countries are affected. According to World Health Organization estimates, up to 56% of all Women living in developing countries are anaemic.² Apart from poverty, there are other factors causing anaemia in women of reproductive age group and in pregnancy, in our country. They are infestation with hookworm, Malaria and kala - azar.³ The growing foetus requires for its haemopoiesis, all the factors which are necessary for the same process in the mother, namely Iron, Folic acid, Vitamin B12 and various other factors.⁴ The causes of anaemia are multiple, but iron deficiency is by far the most important nutritional anaemia worldwide.⁵ Too many pregnancies that are closely spaced are also common in India, and put a heavy nutritional

demand on the woman who, after a pregnancy and lactation, has no time for physiological recovery before a subsequent pregnancy.⁶ The physiological haemodilution during pregnancy reduces the haemoglobin percentage and the Red cell count, and the previous nonpregnant anaemia condition becomes clinically more evident.⁷

Aims and Objectives

To assess the role of safety and efficacy of different therapies for treatment of anaemia and its outcome-

- To screen and diagnose all the patients suffering from anaemia and give them appropriate treatment for the same and further prevention in context to public health.
- To compare the effects of anaemia correction in booked and unbooked antenatal patients by prescribing inj. iron sucrose and blood transfusion respectively.
- To compare results of oral haematinics and iron sucrose in booked anaemic patients
- To study the results of final outcome in booked patients treated with iron sucrose with group of unbooked patients coming as emergency corrected their anaemia status with blood transfusion
- To assess the role of safety and efficacy of different therapies for treatment of anaemia and its outcome.
- To study and derive a result by which the incidence of anaemia can be decreased so that the morbidity and mortality burden can be decreased.

MATERIALS AND METHODS

Out of 300 antenatal 150 were booked and 150 were unbooked patients who came in emergency.

Inclusion Criteria

All cases of antenatal patients with haemoglobin level ≤ 10 gm% coming to the hospital.

Exclusion Criteria

All females having Haemoglobin level ≥ 10 gm%.

A detailed clinical history including patients complains, socio – economic status, obstetric history, menstrual history, past and personal history was taken. Detailed clinical examination was done keeping in mind the manifestations of anaemia e.g. pallor, oedema, koilonychia etc. A detailed haematological study, stool and urine examination was carried out to find out the cause and associated conditions. Haemoglobin estimation and complete blood count was done on 5-part cell counter based on Coulter's principle of electrical impedance. Peripheral smear was studied after staining with Leishman's stain. The morphology of red blood cells for its abnormal shape and size, target cells, malarial parasites, polychromatic cells etc. was studied in detail. The Group – A patients with mild to severe degrees of anaemia who were our registered patients were given Inj. Iron sucrose I/V+ Vitamin B12 were given on alternate day and oral supplementation of folic acid was given along with it. Haemopoietic response was determined after 4 weeks and rise of haemoglobin, red blood cell count and packed cell volume were determined. Then, these cases were put on

oral iron therapy till term and at term again the investigations were done, and their obstetric outcome was observed. Associated conditions were treated during the course of follow – up with appropriate drugs. The group –B patients with mild to severe degrees of anaemia, who came in our emergency room were treated during the time of hospital stay with Blood transfusion and their obstetric outcome was observed. The outcome of these two groups of antenatal patients was compared.

RESULTS

Maternal Outcome	Number	Percentage
ABRUPTIO + PTVD + SEPSIS	1	0.7%
FTLSCS	8	5.3%
FTLSCS + PREECLA	2	1.3%
FTND	109	72.7%
FTND + PPH	1	0.7%
FTND + Pre- eclampsia	2	1.3%
FTND + PREECLA	1	0.7%
FTND + PUERPERAL SEPSIS	1	0.7%
PTLSCS AT 8 MOA	3	2.0%
PTVD	18	12.0%
PTVD + PREECLA + SEPSIS	1	0.7%
PTVD + PUERPERAL SEPSIS	2	1.3%
PTVD + SEPSIS	1	0.7%
Table 1. Obstetrical Outcome of Registered Women who Received Iron Sucrose (Total No. of Patients= 150)		

PTVD= Preterm Vaginal Delivery.

FTND= Full Term Normal Delivery.

PPH= Post-Partum Haemorrhage.

PREECLA= Preeclampsia.

PTLSCS= Preterm Lower Segment Caesarean Section.

MOA= Month of Amenorrhea.

Out of all the 150 antenatal patients, who received Iron Sucrose therapy were followed till their delivery. Their obstetrical outcome was also studied. A total of 109 patients (72.7%) had achieved full term and had a normal full-term vaginal delivery. 18 (12%) had pre-term delivery, 8 patients (5.3%) reached full term but had LSCS due to obstetrical indications. 3 females (2%) had pre-term LSCS at 8 months due to obstetrical indications. 2 patients (1.3%) had FTLSCS associated with pre- eclampsia, 2 patients (1.3%) had FTND with pre – eclampsia, 2 (1.3%) had PTVD with puerperal sepsis. 1 patient (0.7%) each had abruption placenta with PTVD and Sepsis, FTND with PPH, FTND with Puerperal Sepsis, PTVD with pre – eclampsia and Sepsis and PTVD with Sepsis alone respectively.

Maternal Outcome	Number	Percentage
FTLSCS/PT DIED OF HEART FAILURE	1	0.7%
FTLSCS	12	8.0%
FTLSCS + ECLAMPSIA	1	0.7%
FTLSCS + ECLAMPSIA + PPH	2	1.3%
FTLSCS + PPH	2	1.3%
FTLSCS + PPH + PT DIED	1	0.7%
FTLSCS + PRE-ECLAMPSIA	6	4.0%
FTLSCS + PUERPERAL SEPSIS	1	0.7%
FTND	46	30.7%
FTND + ABRUPTION	1	0.7%
FTND + FORCEPS	1	0.7%
FTND + PPH	6	4.0%
FTND + PPH + PT DIED	1	0.7%
FTND + PRE-ECLAMPSIA	4	2.7%
FTND + PUERPERAL SEPSIS	7	4.7%
PTLSCS	2	1.3%
PTLSCS + PLACENTA PREVIA	1	0.7%
PTLSCS + PPH	2	1.3%
PTLSCS + PRE-ECLAMPSIA	1	0.7%
PTLSCS + PUERPERAL SEPSIS	1	0.7%
PTVD	31	20.7%
PTVD + ABRUPTION	1	0.7%
PTVD + PPH	6	4.0%
PTVD + PPH + DIC. PT DIED	2	1.3%
PTVD + PRE-ECLAMPSIA	2	1.3%
PTVD + PRE-ECLAMPSIA + PPH	1	0.7%
PTVD + PUERPERAL SEPSIS	7	4.7%
PTVD + TWINS	1	0.7%

Table 2. Obstetrical Outcome of Emergency Patients who did not Receive Iron Sucrose (Total No. =150)

Patient's Status	Maternal Outcome			Statistical Values
	FTVD without Complication	FTVD with Complication / Other Modes of Delivery	Total	
Registered Patients who Received Iron Sucrose	109	41	150	= 52.979 p < 0.0001
Emergency Patients who did not Received Iron Sucrose	46	104	150	

Table 3. Effect of Treatment with Iron Sucrose on Maternal Outcome (n=300)

The above table shows statistical analysis between the effect of treatment with iron sucrose and without any treatment, on its maternal outcome. Amongst the 150 registered antenatal cases, who received IRON SUCROSE, there were 109 FTND, and only 41 patients had Deliveries with complications and other modes. Whereas, the other 150 untreated patients who came to the emergency room had 46 FTND and 104 complicated deliveries. According to the analysis p value is < 0.0001 which is highly significant.

Labour	Number	Percentage
Term Labour	124	82.67%
Post term Labour	0	00%
Pre-term Labour	26	17.33%
Total	150	100.0%

Table 4. Obstetrical Outcome of Registered Patients who Received Iron Sucrose (n=150)

PTVD= Preterm vaginal delivery.
FTND= Full term normal delivery.
PPH= Postpartum haemorrhage.
PREECLA= Preeclampsia.
PTLSCS= Preterm lower segment caesarean section.
DIC= Disseminated intravascular coagulation.
PT= Patient.

Above data shows the obstetrical outcome in patients who did not receive any prior treatment and were managed in the emergency room. Out of 150 patients, 46 (30.7%) had FTND, 31 (20.7%) had PTVD, 12 (8%) had FTLSCS, 7 (4.7%) had FTND with Puerperal Sepsis and PTVD with Puerperal Sepsis respectively, 6 (4%) had FTLSCS with Pre-eclampsia, FTND with PPH, PTVD with PPH respectively. 4 (2.7%) had FTND with pre-eclampsia, 2 patients (1.3%) had FTLSCS with eclampsia and PPH, 2 had FTLSCS with PPH, PTLSCS, PTLSCS with PPH, PTVD with pre-eclampsia. 2 patients (1.3%) had PTVD with DIC and PPH and patients died. 1 patient (0.7%) had FTLSCS and patient died of heart failure, FTLSCS with eclampsia, FTLSCS with PPH and patient died. 1 patient had FTLSCS with sepsis, FTND with abruption, FTND with forceps, FTND with PPH, pt died, PTLSCS for placenta previa, PTLSCS with pre-eclampsia, PTLSCS with sepsis, PTVD with abruption, PTVD with pre-eclampsia and PPH, PTVD with twins respectively.

In this group of 150 patients who received Iron Sucrose, 124 patients (82.67%) had term labour, 26 (17.33%) had pre-term labour, and none had post-term labour.

Labour	Number	Percentage
Term labour	92	61.33%
Post Term Labour	0	00%
Pre-term labour	58	38.67%
Total	150	100.0%

Table 5. Obstetrical Outcome of Emergency Patients who did not Received Iron Sucrose (n=150)

In this group, the 150 patients who did not receive Iron Sucrose, their maternal outcome was also observed. About, 92 patients (61.33%) had term labour, 58 patients (38.67%) had pre-term labour and none had post-term labour.

DISCUSSION

In the developing world, anaemia is most preventable yet most prevalent, current strategies to prevent and correct anaemia and iron deficiency in pregnant women have met with little success.⁸ Two large studies involving over one million pregnancy clearly indicate that favourable pregnancy outcomes are less frequent among anaemic mothers⁹ eradicate it certain steps can be taken at individual and community level like education of the women as regards anaemia, its causes and health implication.¹⁰

Imparting nutritional education, with special emphasis on strategies based on locally available food stuffs to improve the dietary intake of proteins and iron, administration of appropriate iron supplements and ensuring maximum compliance, deworming, treatment of chronic disease like malaria and universal antenatal care to pregnant women will help in combatting this serious problem.¹¹

Long term policies by government, non-government agencies and the community can be directed to formulate effective plans like eradicating anaemia in children and adolescent girls. Anaemia per se is directly responsible for about 20% maternal deaths in India and is a predisposing factor for foetal wastage.

The conventional approach to diagnose iron deficiency anaemia is to estimate haemoglobin, haematocrit, erythrocyte count, serum iron and total iron binding capacity. Even, low serum ferritin levels have been considered to be the hallmark of iron deficiency and used widely for diagnosis. Serum plasma ferritin is a sensitive indicator for assessing iron status, the patients who were included in this study were all anaemic. Maximum patients were having Hb levels between 7-7.4 gm%. In the patients who received Iron sucrose, there was a significant rise of haemoglobin and thus, adverse outcomes were seen less in the patients. In the patients who were not treated with Iron sucrose, as they came in the emergency room, they were given Blood transfusion to combat anaemia. These patients had maximum preterm labour at 7-8 months of amenorrhoea.

The increased risk of perinatal mortality can be attributed to sepsis and prematurity. Higher incidence of maternal complications in mothers with anaemia is due to inadequate oxygen decreased immunity and these coincide with Kitay, Harbort (1975).¹²

The complications of labour and maternal and perinatal mortality were much more in patients who did not receive any treatment. The aetiology of anaemia has not changed over the decades. Apart from early marriage, repeated pregnancies, poor dietary habits, poverty and illiteracy are all factors which affect its incidence and severity.

Dr. S. V. Subramanian, Professor of Population Health and Geography, Harvard university, and one of the lead researchers expressed that "India continues to have severe anaemia burden."

This emphasis highlights the social patterning of anaemia by socio economic status and education in low and middle-income country like India.

It is estimated that 7.3 million perinatal deaths occur annually in the world and by correcting anaemia many of these deaths can be prevented. Since, the demand of micronutrients is maximum in third trimester and women present for antenatal care in third trimester, this could be one of the reasons for high prevalence of anaemia. It is evident that anaemia during pregnancy is a major factor for morbidity and mortality. Though it is a preventable condition it still remains a challenging problem to obstetricians. Adequate antenatal care and suitable therapy can reduce the maternal mortality.

CONCLUSION

In the present study, 300 cases having anaemia were selected. They were divided in to two groups, Group A (150 Patients): treated registered patients and Group B: untreated emergency room patients (150 Patients). Patients who came to emergency room were given blood transfusion as there was no time for oral or intravenous iron therapy. Patients of other group were treated with Inj. Iron Sucrose I/V and Inj. Vitamin B12 + folic acid. The haemopoietic response was studied after 4 weeks or when the patient came to us for followup after the treatment. Patients were observed till term and were kept on oral haematinics for maintenance of the Hb levels. The impact of corrected haematological status was found to be beneficial on the obstetric performance, maternal and foetal well-being. Thus, from the above study and its analysis we can conclude that, prompt diagnosis and early correction of anaemia will lead to an enormous reduction in the prevalence of anaemia. It will help build up a healthier society. Maternal correction of anaemia will lead to healthy off springs. The study proved that illiteracy, lack of proper knowledge and education, poor sanitation, inadequate intake of bioavailable dietary iron are one of the causes of increased prevalence of anaemia.

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