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ORIGINAL ARTICLE

Frequency of anemia in patients with preterm labour.

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ABSTRACT… Objective: To determine the frequency of anemia in pregnant women with preterm labour. **Study Design:** Cross Sectional Study. **Setting:** Department of Obstetrics & Gynecology, Jinnah International Hospital (Teaching Hospital of Women Medical College), Abbottabad. **Period:** July 2020 to December 2020. **Material & Methods:** The study comprised 171 females with a singleton pregnancy on ultrasound, gestational age of 24 to 37 weeks on ultrasound, parity 0-4 and preterm labour. Patients with history of cervical insufficiency, vaginal infection in last one year and urinary tract infection in last one year were excluded. Venous blood was collected from all 171 women in sodium EDTA tube by a 3rd year resident and was immediately sent to laboratory. Hemoglobin < 9 g/dL was recorded as anemia. **Results:** The participants in this study ranged in age from 18 to 40 years, with mean age of 28.274±3.48 years, mean gestational age was 30.473±3.37 weeks, mean parity1.064±1.28 and mean weight was 73.836±9.74. Anemia was seen in 41.5% patients. **Conclusion:** The study gave us the information about the importance of iron deficiency anemia as a risk factor for preterm labor.

Key words: Anemia, Frequency, Preterm Labour.

INTRODUCTION

Preterm birth is still one of the leading causes of perinatal death and morbidity around the world.[1] The most common haematological issue during pregnancy is anaemia. The World Health Organization (WHO) defines anaemia during pregnancy as a Hemoglobin (Hb) level of less than 11 g/dL, which is the borderline between "physiologic anaemia during pregnancy" and "true anaemia during pregnancy."[2]

Anemia during pregnancy is a public health issue all over the world. Anemia is thought to be prevalent in 20 percent to 40 percent of pregnant women.[3] According to the WHO, there is a high incidence of anaemia in the third trimester of pregnancy, with rates ranging from 2% to 82 percent.[4] According to the Globe Health Organization, there are 2,150 million anaemic people in the world, with pregnant women accounting for 51% of this burden.[5]

A number of mechanisms have been proposed to explain how iron deficiency and anaemia could impair embryonic growth. Iron deficiency and hypoxia caused by anaemia can cause maternal and foetal stress, which raises norepinephrine levels.[6] Stress causes the creation of corticotrophin-releasing hormone, which boosts the production of foetal cortisol. As a result, cortisol's activity may impede the fetus's longitudinal development. Another possibility is that iron shortage damages erythrocytes and the feto-placental unit due to oxidative stress. Maternal infections, which can boost the formation of CRH and are a major risk factor for preterm delivery, can potentially be exacerbated by iron deficiency.[6] Preterm labour can be caused by a variety of factors, including maternal infection, hypoxia, and oxidative stress.[7] Low haemoglobin levels caused by iron deficiency can lead to a state of low-grade chronic hypoxia, which can cause maternal and fetal stress. The maternal or foetal hypothalamic–pituitary–adrenal axis can be stimulated by an active immune system

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in the presence of infections and inflammation, as well as corticotrophin-releasing hormone or cortisol released in reaction to stress.[7] This, in turn, can cause labour to begin and, ultimately, preterm birth. Finally, iron deficiency can enhance oxidative stress, causing erythrocyte and feto-placental unit damage.

In a study by Majeed T and her associates has found that frequency of anemia was 30% in pregnant women with preterm labour.[8]

In another recent study, it has been found that frequency of anemia was 48.6% in pregnant women with preterm labour.[9]

No such study has been done before in our Northeastern Pakistan area. The significance of my research stems from the fact that it was conducted in our local population, particularly in our area (Abbottabad), where anaemia during pregnancy is prevalent at an alarming rate of 60%.[10] So there is a dire need to determine the frequency of anemia in pregnant women with preterm labour in our local population. This study will pave the way to consider maternal anemia as a risk factor for preterm labour and to plan proper management in anemic pregnancy.

MATERIAL & METHODS

The Cross Sectional Study, was done in department of Obstetrics & Gynecology, Jinnah International Hospital, Abbottabad. Duration of study was 6 months, from 1st July 2020 to 31st Dec 2020. Sample size was taken as 171, calculated by using WHO calculator with expected proportion (anemia) = 48.6%.[9] and q=1-p and d= 7.5% with 95% Confidence level. Sampling technique was non-probability consecutive sampling. Inclusion criteria includes women age 18-40 years, Singleton pregnancy on ultrasound, Gestational age 24 to 37 weeks on ultrasound, Parity and preterm labour as per operational definition. Exclusion criteria includes, H/O Cervical Insufficiency, H/O vaginal infection in last one year, H/o Urinary tract infection in last one year.

Patients fulfilling the inclusion criteria from indoor department of Obstetrics & Gynecology, Jinnah International Hospital, Abbottabad. After receiving clearance from the ethical committee and the research department (WMC-Estb/5341), they were included in the study. The patient was given a full explanation regarding their participation in the trial and was given signed informed consent describing the study's benefits. Basic demographics like age, gestational age, parity, economic status and weight and other data was recorded on a proforma.

Venous blood was collected from all 171 women in sodium EDTA tube by a 3rd year resident and was immediately sent to laboratory. Hemoglobin < 9 g/dL was recorded as anemia.

A statistical analysis application was used to examine the data (IBM-SPSS-version-22). For quantitative characteristics such as age, parity, gestational age, and weight, the mean and standard deviation were provided. Frequency and percentage was computed for qualitative variables like economic status and anemia. Outcome variable was stratified by age, gestational age, parity, economic status and weight. The chi square test was used after stratification, and P-value 0.05 was considered statistically significant.

RESULTS

Age range in this study was from 18 to 40 years with mean age of 28.274±3.48 years, mean gestational age was 30.473±3.37 weeks, mean parity1.064±1.28 and mean weight was 73.836±9.74 as shown in Table-I.

Economic status is shown in Table-II.

Anemia was seen in 41.5% patients as shown in Table-III.

Stratification of Anemia with respect to age, gestational age, parity, weight and economic status are shown in Table-III, IV, V, VI, VII and VIII respectively.

	Demographics	Mean ± SD
1	Age (years)	28.274±3.48
2	Gestational age (weeks)	30.473±3.37
3	Parity	1.064±1.28
4	Weight (Kg)	73.836±9.74

Table-I. Mean ± SD of patients according to Age, gestational age, parity and weight. n=171

Economic Status	No of Patients (%)
Poor	53 (31%)
Middle	103 (60.2%)
Rich	15 (8.8%)
Total	171 (100%)

Table- II. Frequency and %age of patients according to economic status. n=171

Anemia	No of Patients (%)
Yes	71 (41.5%)
No	100 (58.5%)
Total	171 (100%)

Table-III. Frequency and %age of patients according to anemia. n=171

Age (Years)		Anemia		P-Value
		Yes	No	
1	18-30	54(42.9%)	72(57.1%)	0.553
2	31-40	17(37.8%)	28(62.2%)	
Total		71(41.5%)	100(58.5%)	

Table-IV. Stratification of anemia with respect to age.

Gestational Age (weeks)		Anemia		P-Value
		Yes	No	
1	24-30	38(45.8%)	45(54.2%)	0.272
2	31-37	33(37.5%)	55(62.5%)	
Total		71(41.5%)	100(58.5%)	

Table-V. Stratification of anemia with respect to gestational age.

Parity		Anemia		P-Value
		Yes	No	
1	0-2	50(39.7%)	76(60.3%)	0.414
2	3-4	21(46.7%)	24(53.3%)	
Total		71(41.5%)	100(58.5%)	

Table-VI. Stratification of anemia with respect to parity.

Weight		Anemia		P-Value
		Yes	No	
1	≤70	28(37.3%)	47(62.7%)	0.326
2	>70	43(44.8%)	53(55.2%)	
Total		71(41.5%)	100(58.5%)	

Table-VII. Stratification of anemia with respect to weight.

Economic Status		Anemia		P-Value
		Yes	No	
1	Poor	46(86.8%)	7(13.2%)	0.000
2	Middle	21(20.4%)	82(79.6%)	
3	Rich	4 (26.7%)	11(73.3%)	
Total		71(41.5%)	100(58.5%)	

Table-VIII. Stratification of anemia with respect to economic status.

DISCUSSION

In this study 41.5% of the patients with preterm labor had iron deficiency anemia. This result is comparable with studies in the industrialized countries. These studies have shown that moderate to severe anemia (9 to 10gm/dl) has been associated with a 2-3 fold increased risk of preterm labor.[11] Preterm labour was observed in 48 percent of pregnant women with blood ferritin levels < 10 micrograms/liter in another study conducted in Germany by Goepel et al. These studies did not exclude pregnant women with viral illnesses who had elevated blood ferritin levels because its value as an indication of iron reserves is lost in those individuals.[12] A study has shown a high incidence of preterm labor in lower socio-economic group.[13] Similarly in our research 86.8% of the patients belong to lower class and 20.4% to middle class. In a data from UK by Steer et all, in 1995, at maternal haemoglobin values of 9.6-10gm/dl, the lowest rate of preterm birth was seen. In our study, 20% of the preterm births occurred in patients having hemoglobin between 9.6-10.5gm/ dl.[14] In our research, hemoglobin below the cut-off point, i.e. 10gm/dl is associated with preterm labor whereas many studies carried out by Rasmussen report a U-shaped association between the hemoglobin and the duration of gestation, i.e., thee is increased risk of preterm labor at extremes of hemoglobin values.[15]

Another study carried out by Scanlon in 2000 reports the minimum risk of preterm birth if the maternal hemoglobin is more than 11gm/dl. In our study 16% off the patients had preterm labor whose hemoglobin was more than 11gm/dl. When the association of hemoglobin with perinatal morality was studied, it was seen that perinatal mortality rate was lower at maternal hemoglobin values of 10.4-13.2gm/dl in data collected by Murphy at

al from Cardiff Birth Survey. One of risk factors identified for preterm labor by epidemiological studies include poor antenatal care. In our research 64% of the patients presenting with preterm labor did not receive any antenatal care. Because a high number of women have trouble maintaining iron storage throughout pregnancy and are at risk for anaemia, iron supplementation looks to be an useful strategy to prevent iron deficiency in pregnant women. Furthermore, iron supplementation during pregnancy is not linked to any significant health hazards.

In our study 39.7% of the patients were 0-2 parity and 46.7% were of 3-4 parity. Anemia in the first trimester of pregnancy increases the chance of premature birth, according to a recent study (relative risk, 1.65 [95 percent CI: 1.31-2.08]). In the second (relative risk, 1.45 [95 percent CI: 0.79-2.65]) and third trimesters, however, this link was not significant (relative risk, 1.43 [95 percent CI: 0.82-2.51]).[16] A review of recent studies shows association of term of pregnancy with preterm and low birth weight. According to the association between maternal anaemia and SGA based on pregnancy trimester, maternal anaemia was significant in the first trimester but not in the second trimester.[17] In the first trimester of pregnancy, there was a substantial link between maternal anaemia and infant low birth weight.[18]

CONCLUSION

The study gave us the information about the importance of iron deficiency anemia as a risk factor for preterm labor. It will help the clinicians in selecting the patients with anemia and rendering them to appropriate investigations and treatment. This approach will help in reducing complications like prematurity and the morbidity and mortality associated with preterm labor.

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