

Relationship between Maternal Hemoglobin Concentration to the Newborn Cord Blood Hemoglobin and Serum Concentration

INTRODUCTION

Anemia is one of the most frequent complications related to pregnancy. During this period, the most common type that occurs is iron deficiency. The cut-off values of blood hemoglobin for pregnant women is $>11\text{g/dl}$ and serum ferritin $>10\text{ug/l}$, while the level for neonatal hemoglobin is $>13\text{g/dl}$ and serum ferritin is $>75\text{ug/l}$. During pregnancy anemia is labeled when hemoglobin level are less than 11. As part of normal physiology of pregnancy, absorption of dietary iron from the gut is increased, in response to increased iron demand. Despite this adaption, pregnant female still require supplementary iron. Low iron store at birth, as well as iron deficiency in infancy adversely affect cognitive, emotional, motor, and neurophysiologic development of the child. The WHO reports that around 35-75% (56% on average) of pregnant female in developing countries is anemic, whereas those affected in industrialized nations make up only 18%. In Pakistan, the prevalence is 48.2%, out of which iron deficiency is the cause of 90.5% of the anemia. It has recently been discovered that 56% of children under the age of five years are anemic in

Pakistan. Children aged between 6 months to 3 years are 60- 90% of affected . The mean cord blood hemoglobin concentration and mean serum ferritin concentration was found 12.54 ± 2.54 and 7.26 ± 115.60 in newborn of anemic pregnant women. As there is high prevalence of anemia in pregnant women in Pakistan. The purpose of the study is to determine the mean cord hemoglobin and serum ferritin in newborn of anemic mother. This study will provide the baseline data which was helpful to develop further statistics and protocol to prevent this deficiency

MATERIAL & METHOD

This cross sectional study was conducted at Gynae & Obs department of Dow University Hospital, a tertiary care hospital in Karachi, Pakistan during the period from January, 2018 to July, 2019. A total of 100 anemic pregnant women with ages 18 to 40 years were enrolled in this study. Detailed demographics including age, parity, gestational age, education and family income were recorded after taking written informed consent. Gestational age 42 week by last menstrual period (LMP), twin or multiple pregnancies on ultrasound, intrauterine death/still birth on ultrasound, maternal age 40year, and women with parity >4 were excluded. Cord blood sample (5ml) was obtained by sterile needle puncture immediately after cord clamping. 2ml will collected in EDTA bottle for full blood count analysis and 3ml collected in plain bottle for serum ferritin analysis. Final outcome was recorded on approved proforma. Analysis will performed using SPSS version 18. Frequency was calculated for categorical variable like parity.

Education Level and family monthly income. Mean and standard deviation will computed for numerical variable like age, Hb level of mother, Hb level of newborn and serum ferritin level in newborn. Stratification with respect of age. Post stratification ANOVA for more than two groups and t-test for two groups was applied. p value ≤ 0.05 was taken as significant.

CONCLUSION

We found that average hemoglobin of the women recruited in our study was $9.59\pm 0.815\text{ g/dl}$ however we could find no correlation between mean cord blood hemoglobin and ferritin concentration in newborn of anemic mothers.

RESULTS

Mean average age of the patients was 29.33 ± 3.23 years, mean hemoglobin of the women was $9.59\pm 0.815\text{ g/dl}$. Mean gestational age was 38.26 ± 1.17 weeks. Regarding parity of the women, 25% women had para 1 and 75% had parity 2 to 4. 65% patients were literate while 35% were illiterate. 32% patients had family income >20000 rupees, 38% had 15000 to 20000, 25% had >10000 to 15000 and 5% had ≤ 1000 rupees. Mean cord blood hemoglobin and ferritin concentration in newborn of anemic mothers was $14.78\pm 1.62\text{ g/dl}$ and $94.10\pm 67.47\text{ u/ml}$ as shown in table 2. Comparison mean cord blood hemoglobin and ferritin concentration in newborn among different age groups, and found no significant difference with p-value >0.05

Table No 3: Comparison of Mean Cord Blood Hemoglobin and Ferritin Concentration in Newborn of Anemic Mothers among Different Maternal Age Groups

Variables		Age Groups (Years)			P-Values
		≤ 25	26 to 30	>30	
Cord Blood Hemoglobin (g/dl)	n	12	57	31	0.96
	Mean	14.79	14.81	14.7	
	Std. Deviation	1.35	1.72	1.59	
Cord Blood Ferritin (u/ml)	n	12	57	31	0.95
	Mean	88.93	95.17	94.13	
	Std. Deviation	59.56	71.88	63.74	