



## To Study Hemato- Biochemical Parameters In Cord Blood At Birth And At Postnatal Period & Its Correlation With Antenatal Risk Factors.

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### Abstract

**Background:** - Umbilical cord blood (UCB) is used for screening and diagnosis of diseases can be taken immediately after birth. Hemoglobin along with hematocrit values have been used in the diagnosis and follow-up of the neonatal anemia. In the proposed study, we plan to compare the hemato-biochemical parameters in cord blood and at 72hr after birth in neonate and association of these parameters with antenatal risk factors.

**Aim:** - To study hemato- biochemical parameters in neonates at birth by mean of cord blood sampling, comparison of these parameter in cord blood sample and peripheral venous blood at 72 hr and To evaluate role of these parameters in admitted neonates in various diseases.

**Results:-** Among the 150 neonates in the group, no significant correlation of hematological and biochemical profile with fetal factor (p-value>0.05) except random blood sugar which was significantly different (p-value<0.05) in UCB and at 72 hours and statically significant values at 72 hours with Antenatal risk factor (P-value<0.0001) (except maternal asthma and HIV positivity) , with fetal factor (immediately cried, perinatal asphyxia, grunting, chest indrawing and meconium aspiration syndrome) (P-value<0.05).

**Conclusions:** - There was moderately positive correlation between maternal and fetal hemoglobin, MCV and MCH. However, the correlation between maternal and fetal hemoglobin did not exist. It suggested that the fetal hematological parameters are not reflective of maternal hemogram. In view of the differences observed in UCB from pathological newborns with respect to those in the control group, a future study including a greater number of samples is proposed with the aim of studying each specific maternal disease and obtaining early markers of neonatal damage that could prevent future maternal and perinatal complications.

**Keywords:** NIL

### INTRODUCTION

Umbilical cord blood (UCB) for screening and diagnosis of diseases can be taken immediately after birth. UCB analysis has a definite role for screening the nutritional and metabolic status of newborn babies and can be an early predictor of future wellbeing. The determination of biochemical parameters range values has been established for the purpose of neonatal screening. UCB hemoglobin is a dominant hematologic parameter of newborns at birth.

Hemoglobin along with hematocrit values have been used in the diagnosis and follow-up of the neonatal anemia. The impact of maternal anemia and Other hematologic parameters in the newborn is a matter of concern, especially in developing countries like India. It is essential to study the effect of maternal parameters on the UCB parameters and hemato-biochemical parameters of newborn .

**MATERIAL AND METHODS-** The present study was carried out in January 2019 to January 2020 in the Department of Pediatrics and Neonatology in Neonatal Intensive Care Unit of Mahila Chikitsalya, J.L.N. Medical College, Ajmer which provides neonatal care at this center. The study was conducted on 150 admitted neonates and Sampling was done at the birth (cord blood) and at the age of 72 hour by peripheral venous blood. Approximately 5 mL of blood was collected from the umbilical cord after clamping and cutting of the cord. About 72 hr later, approximately 5 mL of blood sample were collected by venipuncture from peripheral sites. Samples were

transported without delay to the laboratory. The study was planned to understand the correlation of hematological and biochemical parameters in neonates at birth by mean of cord blood sampling and evaluate haemoglobin, total leucocyte count ,random blood sugar, blood urea, serum creatinine, sodium, potassium, chloride and calcium in cord blood in admitted neonates in various diseases.

**OBSERVATIONS AND RESULTS-** A study of 150 cases was undertaken and Sampling was done at the birth (cord blood) and at the age of 72 hour by peripheral venous blood.

**Association of serum sugar of Umbilical Cord blood and at 72 hours of age with antenatal risk factors: -**

Antenatal risk factor	RBS				106
	Umbilical Cord blood values		Values at 72 hours		
	Mean	SD	Mean	SD	
APH (N=22)	100.45	43.97	138.41	52.76	<0.0001
GDM (N=15)	106.40	38.43	130.47	38.62	<0.0001
Thyroid (N=8)	98.50	40.75	158.88	85.32	<0.0001
VDRL(N=10)+ve	115.00	55.54	153.30	40.03	<0.0001
HBS AG (N=11)+ve	95.09	24.57	138.91	36.80	<0.0001
HIV (N=15)	121.13	46.49	123.93	61.18	0.1211
Maternal Fever (N=36)	105.64	57.02	137.47	53.57	<0.0001
Maternal UTI (N=33)	114.85	49.14	141.88	47.76	<0.0001
Anaemia (N=55)	105.08	41.26	135.90	49.49	<0.0001
Maternal Asthma (N=15)	126.68	47.23	128.63	28.38	0.1982

There was significant association between RBS level of Umbilical Cord blood values and Values at 72 hours with Antenatal risk factor (P-value<0.0001) except maternal asthma and HIV positivity.

**Association of Hb of Umbilical Cord blood and at 72 hours of age with fetal factors:-**

Fetal factor	Haemoglobin				P-value
	Umbilical Cord blood values		Values at 72 hours		
	Mean	SD	Mean	SD	
Cried Immediate(normal)	13.66	1.61	13.13	1.37	0.002
Resuscitation Required(P.A.)	13.96	1.67	13.34	1.39	0.0001
Grunting	13.80	1.52	13.22	1.32	0.0005

Chest Indrawing	13.82	1.56	13.23	1.32	0.0005
Meconium-Stained Cord	13.54	1.48	13.04	1.21	0.001

There was significant association between hemoglobin of Umbilical Cord blood values and Values at 72 hours with fetal factors(P-value<0.0001).

**Association of serum sugar of Umbilical Cord blood and at 72 hours of age with fetal factors: -**

Fetal factor	Random Blood Sugar				P-value
	Umbilical Cord blood values		Values at 72 hours		
	Mean	SD	Mean	SD	
Cried Immediate(normal)	106.75	47.15	137.79	44.07	0.001
Resuscitation Required (P.A.)	106.70	44.13	138.07	45.43	0.001
Grunting	102.04	39.58	138.93	51.97	0.001
Chest Indrawing	104.95	42.96	137.41	41.49	0.001
Meconium-Stained Cord	108.85	49.17	144.28	57.86	0.001

There was significant association between serum sugar of Umbilical Cord blood and at 72 hours of age with fetal factors (P-value<0.0001).

**DISCUSSION: -** The present study entitled “To study hemato-biochemical parameter in cord blood at birth and at postnatal period & its correlation with antenatal risk factors” was conducted at Department of Paediatrics and Neonatology, at Neonatal intensive care unit of Rajkiya Mahila Chikitsalya, J.L.N. Medical College, Ajmer. In the present study, we found that mean of hemoglobin was 13.75g/dl, TLC was 9.43/cumm, random blood sugar was 106.06 mg/dl, blood Urea was 36.70mg%, Serum creatinine was 1.27mg%, sodium was 138.12 mE/dl, potassium was 4.08 mE/dl, calcium was 8.03mg% in UCB. The 72-hour blood sample found that the mean hemoglobin was 13.20g/dl, TLC was 9.87/cumm, random blood sugar was 136.55mg/dl, blood urea was 38.28mg%, serum creatinine was 0.86mg%, sodium was 138.93mE/dl, potassium was 4.34mE/dl and calcium was 8.03mg%. Here, we do not find any statistical difference in hematological and biochemical profile of umbilical cord blood and blood sample at 72-hours in all parameters haemoglobin , TLC, blood urea, serum creatinine, sodium, potassium, calcium (P-value>0.05) except blood sugar which was significantly higher at 72-hour sample (P-

value<0.0001). Among hematological profile in our study we do not found any significant association between hemoglobin level of Umbilical Cord blood values and Values at 72 hours with Antenatal risk factors ante partum haemorrhage , diabetes , thyroid, HBsAg reactive ,fever , UTI, anaemia and asthma (P-value>0.05). There was also no significant association between TLC level of Umbilical Cord blood values and Values at 72 hours with Antenatal risk factor (P-value>0.05) except VDRL reactive (P-value-0.0004) and HIV positive mother (P-value-0.0029). Among biochemical profile there was significant association between random blood sugar level of UCB values and Values at 72 hours with antenatal risk factor ante partum haemorrhage , diabetes , thyroid, HBsAg reactive ,fever , UTI, anaemia and VDRL reactive (P-value<0.0001) except maternal asthma (P-value-0.1982) and HIV positivity (P-value<0.1211)

**CONCLUSION: -** There was moderately positive correlation between maternal and fetal hemoglobin, MCV and MCH. However, the correlation between maternal and fetal hemoglobin did not exist. It suggested that the fetal hematological parameters are not reflective of maternal hemogram. In view of the differences observed in UCB from pathological newborns with respect to those in the control group, a future study including a greater number of samples is

proposed with the aim of studying each specific maternal disease and obtaining early markers of neonatal damage that could prevent future maternal and perinatal complications.

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