

# Study of effect of maternal haemoglobin level on cord blood haematological profile (HB, Retic count, PCV) in newborn delivered in PIMS and R Hospital Urun Islampur, Sangli Maharashtra.

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## Abstract

**Background:** It is widely known that newborn haematological parameters are different from those of infants or adults.

**Aims and Objectives:** Study of maternal haemoglobin level on cord blood haematological profile (HB, Retic count, PCV) in newborn delivered in PIMS&R Hospital Urun Islampur, Sangli. **Methodology:** This was a cross-sectional study carried out in the newborns delivered in PIMS&R Hospital Urun Islampur during the one year period i.e. July 2018 to June 2019. So during the one year period 100 newborns were selected for the study. Blood was collected from umbilical cord at birth. Sterile glass bulb containing Ethylene Diamine Tetra acetate (EDTA) were used for collection of blood samples. Concentrate used was 1 mg/ml of blood. PCV was done by Wintrobe's method. Reticulocyte count was done after staining with 1% brilliant cresyl blue, Nucleated Red Blood Cell Count (NRC). The data was entered in excel and analyzed by excel software for windows 10. **Result :** In our study we have seen that Mothers of Parity 1 were 23, 2 - 36, 3- 27, 4- 10, 5- 4. Range of Hb.(%) was 12.19- 21.91, PCV (%) 36.62- 64.58, RC (%) 1.66- 7.10, NRC (%) -0.90- 10.18. The mean  $\pm$  SD was Hb. (%)  $17.08 \pm 2.75$ ;  $17.01 \pm 1.88$  ( $t=0.2$ ,  $p>0.05$ ). PCV (%) -  $50.57 \pm 7.17$ , And  $50.63 \pm 6.73$  ( $t=0.1$ ,  $p>0.05$ ). RC (%)  $4.47 \pm 1.41$  and  $4.24 \pm 1.26$ . NRC (%) was  $5.92 \pm 2.47$  and  $4.98 \pm 1.96$  ( $t=1.06$ ,  $p>0.05$ ) respectively. in males and female not differed statistically. **Conclusion:** It can be concluded from our study that study of the haematological profile is important for the identification and management of haematological diseases of new born also It can be concluded from our study that there is no correlation between Maternal Hb level and cord blood haematological profile in newborn.

**Key Words :** Haematological profile, Newborn, Haemoglobin, PCV, Reticulocyte count .

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## INTRODUCTION

It is widely known that newborn haematological parameters are different from those of infants or adults<sup>1</sup>, including differences according to the blood samples utilized (umbilical cord blood, venous blood, capillary blood) as well as drawing time (2, 12 or 24 hr after birth), and nutritional foetal conditions<sup>3</sup>. Umbilical cord and placenta once regarded as precious when people used to preserve them over trees and under earth. Due to

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Urbanization and education, people considered them as medical wastes and discarded them. Placenta was then harvested by manufacturing units for production of certain drugs. The innovation of stem cells gave umbilical cord a new insight and moreover after the first umbilical cord blood transplant in 1988 by Dr. Gluckman to a 5 year old boy who suffered from Fanconi anaemia. Both the donor and recipient are living models of the success of cord blood transplant<sup>1</sup>. Many studies are undertaken by researchers on umbilical cord and umbilical cord blood (UCB) globally. UCB is stored for years for personal and public use. There are very few published studies so we have conducted study the maternal haemoglobin level on cord blood haematological profile (HB, Retic count, PCV) in newborn delivered in PIMS&R Hospital Urun Islampur Sangli.

## METHODOLOGY

This was a cross-sectional study carried out in the newborns delivered in PIMS&R Hospital Urun Islampur during the one year period i.e. July 2018 to June 2019 so during the one year period 100 newborns were selected for the study. Blood was collected from umbilical cord at birth. Sterile glass bulb containing Ethylene Diamine Tetra acetate (EDTA) were used for collection of blood. Sample concentrate used was 1 mg/ml of blood. PCV by Wintrobe's method. Reticulocyte count after staining with 1% brilliant crusty blue, Nucleated Red Blood Cell Count (NRC). The data was entered in excel and analyzed by excel software for windows 10.

## RESULT

**Table 1:** Distribution of the mothers as per parity

Parity	1	2	3	4	5	6	7
No.	23	36	27	10	4	0	0

Mothers of Parity 1 were 23, 2 - 36, 3- 27, 4- 10, 5- 4

**Table 2:** Maximum mothers were below the parity 3 only 4 mothers with parity 5 were there

	Hb. (%)	PCV (%)	RC (%)	NRC (%)
Mean	17.05	50.60	4.38	5.54
SD	2.43	6.99	1.36	2.32
Range				
M-2 SD	12.19	36.62	1.66	0.90
M + 2SD	21.91	64.58	7.10	10.18

Range of Hb. (%) was 12.19- 21.91, PCV (%) 36.62- 64.58, RC (%) 1.66- 7.10, NRC (%) 0.90-10.18

**Table 3:** Correlation of cord Hb and PCV with Hb of the Mother

Mothers Hb (gm%)	No.		Hb(gm%)	PCV %
8-8.9	11	Mean	16.65	50.55
		Sd	2.40	7.91
9-9.9	25	Mean	17.14	52.44
		Sd	2.03	7.78
10-10.9	31	Mean	17.54	50.01
		Sd	5.05	6.63
11-11.9	16	Mean	16.99	50.38
		Sd	3.11	8.14
12-12.9	14	Mean	17.01	49.71
		Sd	2.11	7.10
13-14	3	Mean	17.07	48.33
		Sd	2.34	6.60
Correlation			0.2	0.6
'f' value			>0.005	>0.005
'p' value			N.S	N.S

The above table is showing no statistical difference i.e. no correlation between cord blood Hb, PCV and mother's Hb at the time of delivery.

The mean (mean  $\pm$ SD) was Hb. (%)  $17.08 \pm 2.75$ ;  $17.01 \pm 1.88$  ( $t=0.2$ ,  $p>0.05$ ). PCV (%) -  $50.57 \pm 7.17$ , And  $50.63 \pm 6.73$  ( $t=0.1$ ,  $p>0.05$ ). RC (%)  $4.47 \pm 1.41$  and  $4.24 \pm 1.26$ . NRC (%) was  $5.92 \pm 2.47$  and  $4.98 \pm 1.96$  ( $t=1.06$ ,  $p>0.05$ ) respectively in males and female not differed statistically.

## DISCUSSION

The cellular components of UCB include stem cells which include mesenchymal stem cells, haematopoietic stem cells and multipotent non-haematopoietic stem cells and mature cells of haematopoietic stem cells namely RBC, WBC and platelets.<sup>5</sup> UCB is a source of haematopoietic stem cell transplant for various malignant and non-malignant haematologic conditions. Though the component of mesenchymal stem cells is low in number due to their high proliferation rate, cord blood can be considered as a source of mesenchymal stem cells also. Moreover, studies have indicated that cord blood reflects foetal haematopoietic and health status of new born and it can be considered an ideal source for laboratory analysis instead of new born blood, the collection of which is difficult. The disease status of new born like asphyxia, meconium staining and chorioamnionitis are reflected in UCB.<sup>6,7</sup> Also maternal conditions like smoking, anaemia, diabetes, preeclampsia and mode of delivery which influence the health status of new born are reflected in the UCB.<sup>8-12</sup> Normal haematimetric values in full term newborn umbilical cord blood are similar to those reported by Tcherna in France<sup>13</sup>, and slightly smaller than those from other authors<sup>14, 15</sup>. Variables remarkably affecting haemoglobin concentration in umbilical cord blood, such as umbilical cord clamping

and materno-foetal transfusion<sup>16, 17</sup>. In our study we have seen that Mothers of Parity 1 were 23, 2 - 36, 3- 27, 4- 10, 5- 4, Range of Hb. (%) was 12.19- 21.91, PCV (%) 36.62- 64.58, RC (%) 1.66- 7.10, NRC (%) -0.90- 10.18 The mean  $\pm$ SD) was Hb. (%)  $17.08 \pm 2.75$ ;  $17.01 \pm 1.88$  ( $t=0.2$ ,  $p>0.05$ ). PCV (%) -  $50.57 \pm 7.17$ , And  $50.63 \pm 6.73$  ( $t=0.1$ ,  $p>0.05$ ). RC (%)  $4.47 \pm 1.41$  and  $4.24 \pm 1.26$ . NRC (%) was  $5.92 \pm 2.47$  and  $4.98 \pm 1.96$  ( $t=1.06$ ,  $p>0.05$ ) respectively in males and female not differed statistically. Cord blood values present study showing similarity with values mentioned by Nelson<sup>28</sup>, Oski<sup>7</sup> and Marks<sup>6</sup> study done on capillary samples were shown values quite higher range 20-23gm%. We also found no any significant difference in values with respect to gender.

## CONCLUSION

It can be concluded from our study that study of the haematological profile is important for the identification and management of haematological diseases of new born. Also It can be concluded from our study that there is no correlation between Maternal Hb level and cord blood haematological profile in newborn.

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