

Clinical Study of Nucleated Red Blood Cells in Umbilical Cord Blood as A Predictor of Neurological Outcome in Birth Asphyxia



Medical Science

KEYWORDS :

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ABSTRACT

Assessment of nucleated red blood cells in cord blood of neonates born with birth asphyxia.

INTRODUCTION

In spite of major advances in monitoring technology and knowledge of fetal and perinatal medicine, birth asphyxia is one of the significant causes of mortality and long term morbidity in India. Perinatal asphyxia results in hypoxic injury to various organs including kidneys, lungs and liver but the most serious effects are seen on the central nervous system [1,2] which cause hypoxic ischemic encephalopathy (HIE). HIE is of foremost concern in an asphyxiated neonate because of its potential to cause serious long-term neuro-motor sequelae among survivors. RBC count in umbilical cord blood of neonates has been reported as a possible marker of birth asphyxia. The levels of NRBC may be correlated with the presence of birth asphyxia.[3,4] The number of NRBC/100 WBC is variable but is rarely greater than 10 in normal neonates.[5,6,7,8]. Its variation in neonates suffering from birth asphyxia was studied and compared to the severity of clinical outcome in these children.

AIM

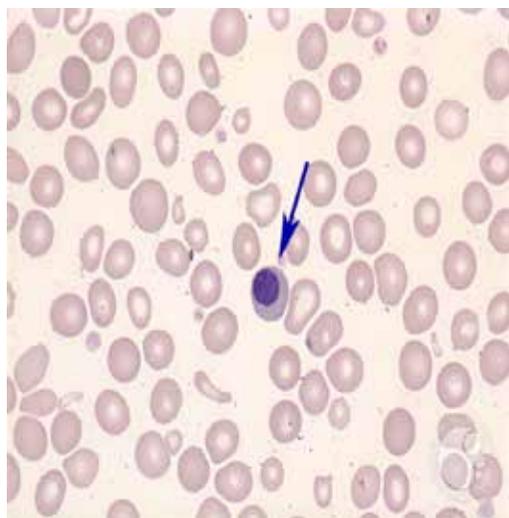
Assessment of nucleated red blood cells in cord blood of neonates born with birth asphyxia.

OBJECTIVES

To investigate the variations in nucleated red blood cells count in cord blood sample of neonates suffering from birth asphyxia.

To find out its relationship to the severity of birth asphyxia.

To evaluate its assessment in short term prognosis of asphyxia



MATERIALS & METHODS

STUDY DESIGN:

Comparative study.

Cord blood sample of 30 newborns suffering from birth asphyxia and 40 normal newborns delivered in Dr. D.Y. Patil Hospital, Kolhapur were taken from September 2014 till date.

INCLUSION CRITERIA:

CASES: All neonates suffering from birth asphyxia, defined as

- 1) Apgar score of <7 at one minute.
- 2) Thick meconium stained amniotic fluid and respiratory depression, hypotonia, or bradycardia.
- 3) Signs of fetal distress (heart rate <100 bpm, late decelerations, or an absence of heart rate variability).
- 4) A need for resuscitation for >1 minute with positive pressure ventilation and oxygen immediately after birth.

EXCLUSION CRITERIA:

Preterm neonates

Rh incompatibility

Infant of diabetic mother

Cyanotic congenital heart disease

Hemolytic jaundice

Chorioamnionitis

OBSERVATIONS

Out of 70 newborns taken in the study, 40 were normal and 30 were suffering from birth asphyxia. (Figure 1)

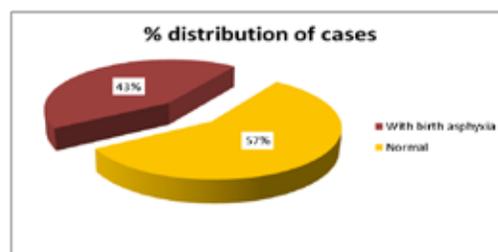


Figure 1 – Pie chart showing distribution of cases in 2 groups

On examination of the cord blood sample of the cases, it was found that all the patients suffering from birth asphyxia (100%) had NRBC count more than 100 while only 8 out

40 (20%) normal newborns had NRBC count more than 10. (Figure 2)

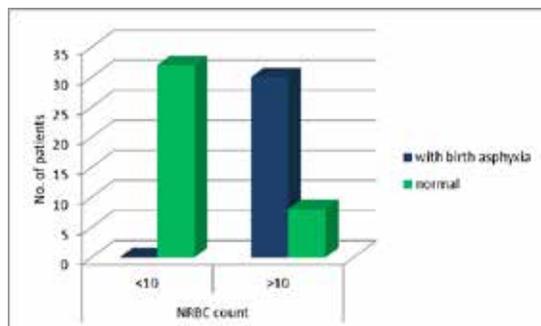


Figure 1- Graph showing NRBC count in both groups of patients

CONCLUSION

NRBCs/100 WBCs is a simple laboratory test which is easy to perform, cost-effective and highly reliable. The cord blood NRBCs/100 WBCs has a potential of being used as a simple marker for determining the severity and predicting the in hospital pre-discharge outcome of fetal asphyxia. The study henceforth will help in evaluating the role of cord blood nucleated RBC count as a marker for presence and severity of birth asphyxia.