Absolute Reticulocyte Count at birth and outcome of Neonates with Persistent PulmonaryHypertension

Madam, Reporting of the reticulolyte count as an absolute number, the absolute reticulocyte count (ARC) appears to be gaining popularity in clinical practice. It has shown to be the best indicator of erythropoiesis. In term neonates, it ranges from 200 to 400 x 109/L.1 Neonates with persistent pulmonary hypertension (PPHN) are in a state of intermittent hypoxia.2,3 The hypoxia stimulates the bone marrow through release of erythropoietin causing increased erythropoiesis, which is reflected by increase in number of erythrocyte precusors in the blood stream. This type of response has been shown earlier with the observation of elevated nucleated red blood cell count in neonates with PPHN.4 However, the clinical significance of these precursor cells in relation to the outcome is not known. Logically, a higher count is expected in neonates with poor outcome and vice versa. The present study was carried out with the aim to look at the relationship between the ARC and the outcome of neonates with PPHN.

The study was performed at the Special Care Baby Unit (SCBU) at Royal Hospital in Muscat which has 30 beds and provides level III-IV care for all high-risk neonates including general and cardiac surgery. Neonates with diagnosis of persistent pulmonary hypertension (PPHN) were reviewed for absolute reticulocyte count (ARC). The diagnosis of PPHN was made based on history, clinical examination and 2-D Echocardiogram.5 According to the outcome, neonates were divided into two groups, group A (survivors) and group B (non-survivors). The detail information and relevant data were collected from computer database (Visual D base software). The ARC for the corresponding neonate was retrieved from the laboratory report section of the central on-line hospital computer system (Medicom). The ARCs were generated by the automated analyser, CELL-DYN, 4000, UK. The first reading of ARC was taken for analysis. The variables including the birth weight, Apgar score, sex, inborn/ outborn and the outcome were noted down. From 1st July 1998 to 30th June 2003, a total of 37 neonates were admitted with diagnosis of PPHN. Comparison among the variables was done using Statistical Package for Social Sciences, version 7.5 for Windows.

Table summarizes the findings of the study. Out of 37 neonates, 22 survived while 15 died. The non-survivor

Table. Comparison between the two groups.

Parameter	Group A (Survivors)	Group B (Nonsurvivors)	P value
Number of cases	22 (60%)	15 (40%)	
Apgarscore at one minute	4.9+2.1	4.7+1.3	0.73
Apgar score at five minutes	7.4+1.5	6.7+1.4	0.16
Birth weight (grams)	3088+479	2962+454	0.42
Absolute reticulocyte	218+77	240+78	0.40

were noted to have a higher mean absolute reticulocyte count in comparison to the survivors, 240 x 109/L and 210 x 109/L, respectively. However, this difference failed to attain any statistical significance.

The higher ARC among the non-survivors indicated that these sets of neonates with PPHN were more sick and hypoxic at birth as compared to the survivors. One could argue about the other confounding variables resulting in elevated ARC among non-survivors. In fact, none of the non-survivors had any hemolytic disease or other risk factors attributing to elevated ARC.

ARC is readily available and reported by most of the laboratory in complete blood count at no extra cost.

There is no need for extra collection of blood as routine full blood count provides the ARC. Thus, clinical use of this important informative parameter should further be evaluated.

In conclusion, we noted a trend of higher ARC in neonates with poor outcome, however it is imperative to look further at the predictive value of ARC in the outcome of neonates with PPHN. A study with larger sample size is suggested.

S. Manzar, S. M. Al Khusaiby

Neonatal Intensive Care Unit,

Department of Child Health,

Royal Hospital, Sultanate of Oman

References

1. Christensen RD. Expected hematologic values for term and preterm neonates. In:Christensen RD (ed). Hematological problems of the neonate. Philadelphia: W. B. Saunders, 2000, pp. 117-83.

2. Avery GB, Fletcher MA, McDonald MG. Neonatology; pathophysiology and management of the newborn, 4th ed. Philadelphia J.B. Lippincott, 1994, pp. 441-5.

3. Roberton NRC. Textbook of neonatology, 2nd ed. London: Longman, 1992, pp. 432-42.

4. Manzar S. Relationship of nucleated erythrocyte count at birth with the severity and outcome of persistent pulmonary hypertension in neonates. J Trop Pediatr 1999; 45:178-9.

5. da Costa DE, Nair AK, Pai MG, et al Steroids in full term infants with respiratory failure and pulmonary hypertension due to meconium aspiration syndrome. Eur J Pediatr 2001;160:150-3.