



## Association between Platelet to Lymphocyte Ratio to ROP in a Preterm Neonate in a Tertiary Centre in Northern India: A Retrospective Observational Study

Aditi saini<sup>1\*</sup>, Anumodan Gupta<sup>2</sup>, Rajnish Kumar<sup>2</sup> and Ganshyam Saini<sup>3</sup>

<sup>1</sup>Department of Obstetrics and Gynaecology, Government Medical College, Jammu, Jammu and Kashmir, India

<sup>2</sup>Department of Neonatology, Government Medical College, Jammu, Jammu and Kashmir, India

<sup>3</sup>Department of Paediatrics, Government Medical College, Jammu, Jammu and Kashmir, India

\*Corresponding e-mail: [sainidraditi@gmail.com](mailto:sainidraditi@gmail.com)

**Received:** 29-January-2023, Manuscript No. IJMRHS-23-88172; **Editor assigned:** 31-January-2023, Pre QC No. IJMRHS-23-88172 (PQ); **Reviewed:** 14-February-2023, QC No. IJMRHS-23-88172; **Revised:** 28-April-2023, Manuscript No. IJMRHS-23-88172 (R); **Published:** 12-May-2023

### ABSTRACT

**Objective:** To figure out association between Retinopathy of Prematurity (ROP) and Platelet to Lymphocyte Ratio (PLR).

**Methods:** A retrospective observational study was conducted, in tertiary care NICU where screening for ROP from January 2021 to December 2021 was done as per institutional protocol. Neonates who were born preterm  $\leq 34$  gestational weeks with ROP were enrolled as the observation group and neonates with no ROP were enrolled as the control group, whose complete blood cell were measured within the first 24 h of life. The levels of PLR were studied in all groups.

**Results:** In this study, 20 cases of ROP were enrolled and 20 cases of no-ROP as controls. The median PLR values were 75.99 (IQR, 50.43-87.11) in the ROP group and 69.24 (IQR, 55.52-88.12) in the non-ROP group, but the difference between groups was not statistically significant ( $P=0.104$ ).

**Conclusion:** Our study has shown that higher PLR in preterm neonates admitted in NICU in first day of life can be evaluated as a biochemical marker for predicting ROP early.

**Keywords:** Preterm, NICU, Platelet to lymphocyte ratio, Retinopathy of prematurity, Protocol

### INTRODUCTION

ROP is one of the leading causes of morbidity in sick preterm [1]. Due to increased survival rate of NICU premie patients in the last decades, newer diagnostic methods with improved sensitivity and specificity are necessary for the proper detection and prognosis of ROP [2]. So, both clinicians and researchers have made widespread efforts to identify biomarkers that predict progression of the disease, response to treatment and survival. Nevertheless, currently there are no suitable predictors that can be widely used in clinical settings, and therefore, better predictive

biomarkers, especially serum biomarkers for predicting the prognosis of various morbidities either BPD, NEC or it may be ROP are urgently needed to save guard these preemies from disability in adulthood.

## LITERATURE REVIEW

Recently, more and more evidence showed that a systemic inflammatory response could play an important role in the development and progression of ROP [3-6]. It is well known that inflammation is closely related to different stages of ROP development, including initiation and progression to different stages. Systemic inflammation can be assessed by means of markers such as C-Reactive Protein (CRP), albumin, Neutrophil Lymphocyte Ratio (NLR) and Platelet Lymphocyte Ratio (PLR). Among these markers, PLR, a combination of circulating platelet and lymphocyte counts, represents systemic inflammation. Its laboratory significance is in under hot topic of research. And now, a series of studies have tried to find out the correlation between PLR and prognosis of ROP. However, according to their results, the current opinion on trole of PLR in ROP is still controversial. We therefore conducted this observational study in our tertiary care NICU to know about the association of PLR in ROP.

## METHODOLOGY

This study was conducted in a medical college in a northern India. Data was collected from admission files of a premature infant who underwent ROP screening in the SMGS hospital GMC Jammu from January 2021 to December 2021. Infants without any other retinal disease and who gestational age less than 34 weeks or birth weight less than 2000 g were included in the study [7].

Neonates with blood culture proven sepsis, necrotizing enterocolitis and blood dyscrasias, and neonates who received a blood product transfusion or postnatal steroid therapy before the ROP screening were excluded. This study followed the medical ethics and to the declaration of Helsinki. ROP screening was performed on all infants according to the screening guidelines for ROP in India (RBSK). Initial screenings occurred at four to six weeks or 21 days after for an extreme preterm neonate after birth. All exams were performed by applying two drops of tropic amide 0.5% and phenylephrine 2.5% for dilating pupil. Ophthalmological examinations were performed using a RetCam III wide angle digital retinal imaging system after topical anaesthesia [8].

The ROP status of each infant was classified according to the international classification of ROP, including stage, zone, extent of disease and presence or absence of plus disease [9]. Each infant was classified according to the maximum stage of ROP observed in either eye. Among the screened premature infants, 20 infants without ROP were randomly selected as the control group and 20 infants with ROP were selected as the ROP group.

Other variables associated with ROP, such as birth weight, gestational age, sex, type of birth, and multiple pregnancies were also recorded. Patients with Hypoxic Ischemic Encephalopathy (HIE), Premature Rupture of Membranes (PROM), Respiratory Distress Syndrome (RDS), asphyxia neonatorum, were considered as have additional potential risk factors [10].

Whole blood samples were collected within the first 24 h of life, due to the potential need for blood transfusion later or the possibility of development of infection with or without sepsis [11].

All blood samples were evaluated within the first 24 h after birth. Peripheral venous blood (0.5 mL) was collected in EDTA tubes complete blood counts were evaluated by an automated haematology analyser (Sysmex XE-2100, Kobe, Japan).

## Statistics

Continuous variables were presented as mean with standard deviation for normally distributed data or as medians and Interquartile Ranges (IQRs) for skewed data.

Dichotomous variables were presented as absolute counts and percentage and compared between groups by *Chi-square* statistical test. Exact P values <0.05 were considered statistically significant. All statistical analyses were performed using SPSS 22.0 (SPSS for Windows, version 22.0; SPSS, Inc., Chicago, IL, USA) [12].



- 
- [8] Turkmen K, et al. The relationship between neutrophil to lymphocyte ratio and vascular calcification in end stage renal disease patients. *Hemodialysis International*, Vol. 18, No. 1, 2014, pp. 47-53.
- [9] Ilhan N, et al. Assessment of neutrophil/lymphocyte ratio in patients with age related macular degeneration. *Ocular Immunology and Inflammation*, Vol. 23, No. 4, 2015, pp. 287-290.
- [10] Yue S, et al. Use of the monocyte to lymphocyte ratio to predict diabetic retinopathy. *International Journal of Environmental Research and Public Health*, Vol. 12, No. 8, 2015, pp. 10009-10019.
- [11] Gole, GA, et al. International committee for the classification of retinopathy of prematurity. The international classification of retinopathy of prematurity revisited. *Archives of Ophthalmology*, Vol. 123, No. 7, 2005, pp. 991-999.
- [12] Woo SJ, et al. The relationship between cord blood cytokine levels and perinatal factors and retinopathy of prematurity: A gestational age matched case control study. *Investigative Ophthalmology and Visual Science*, Vol. 54, No. 5, 2013, pp. 3434-3439.
- [13] Song X, et al. Comparison of preoperative neutrophil-lymphocyte, lymphocyte-monocyte and platelet-lymphocyte ratios in patients with upper urinary tract urothelial carcinoma undergoing radical nephroureterectomy. *Onco Targets and Therapy*, Vol. 9, 2016, pp. 1399-1407.
- [14] Yamagishi T, et al. Prognostic significance of the lymphocyte to monocyte ratio in patients with malignant pleural mesothelioma. *Lung Cancer*, Vol. 90, No. 1, 2015, pp. 111-117.
- [15] Ozgonul C, et al. Accurate use of neutrophil/lymphocyte ratio in patients with keratoconus. *Cornea*, Vol. 34, No. 2, 2015, pp. 4-5.
- [16] Guthrie GJ, et al. The systemic inflammation based neutrophil-lymphocyte ratio: Experience in patients with cancer. *Critical Reviews in Oncology Hematology*, Vol. 88, No. 1, 2013, pp. 218-230.
- [17] Kurtul BE, et al. Serum neutrophil to lymphocyte ratio in retinopathy of prematurity. *Journal of American Association for Pediatric Ophthalmology and Strabismus*, Vol. 19, No. 4, 2015, pp. 327-331.
- [18] Ying HQ, et al. The prognostic value of preoperative NLR, d-NLR, PLR and LMR for predicting clinical outcome in surgical colorectal cancer patients. *Medical Oncology*, Vol. 31, No. 12, 2014, pp. 305.