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# PROGNOSTIC SIGNIFICANCE OF MPV/PLATELET RATIO IN CHILDREN WITH SEVERE PNEUMIA: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT

**Background:** Pneumonia remains one of the leading causes of morbidity and mortality among children worldwide, particularly in developing countries. Early identification of children at risk of severe disease and poor outcomes is essential for prompt management. Mean Platelet Volume/Platelet Count (MPV/PC) ratio has emerged as a potential inflammatory and prognostic biomarker in infectious diseases due to its association with platelet activation and systemic inflammation. The aim is to assess the prognostic significance of MPV/Platelet ratio in children with severe pneumonia aged between 1 month and 18 years. The objective to evaluate the MPV/Platelet ratio in children admitted with severe pneumonia. To determine the association between MPV/Platelet ratio and severity of pneumonia during hospitalization. To study the complications and clinical outcomes in severe pneumonia in relation to MPV/Platelet ratio till discharge.

**Materials and Methods:** This prospective observational study was conducted in the Department of Pediatrics at a tertiary care teaching hospital over a period of 18 months. A total of 135 children aged between 1 month and 18 years diagnosed with severe pneumonia were included in the study. Clinical details, laboratory investigations, and outcomes were recorded using a structured proforma. MPV/Platelet ratio was calculated from complete blood count parameters. Patients were followed till discharge for assessment of disease progression, severity, complications, PICU requirement, respiratory support, and recovery outcomes. Statistical analysis was performed using SPSS software, and p-value <0.05 was considered statistically significant.

**Results:** Among 135 children, 55 (40.7%) had MPV/PC ratio ≥0.03 while 80 (59.3%) had MPV/PC ratio <0.03. Progression of pneumonia was significantly higher among children with MPV/PC ratio ≥0.03 [46 (90.2%)] compared to those with MPV/PC ratio <0.03 [5 (9.8%)] (OR=76.67; p<0.001). Severe pneumonia during hospitalization was significantly associated with elevated MPV/PC ratio (OR=5.03; p<0.001). Requirement of PICU admission and HFNC support were also significantly higher among children with MPV/PC ratio ≥0.03 (p<0.001). ROC analysis showed good prognostic performance with AUC 0.868, sensitivity 90%, and specificity 90% at cut-off value ≥0.03.

**Conclusion:** MPV/Platelet ratio is a simple, inexpensive, and easily available prognostic marker in children with severe pneumonia. Elevated MPV/PC ratio is significantly associated with disease progression, increased severity, and adverse clinical outcomes. MPV/PC ratio may therefore be useful for early risk stratification and prognostication in pediatric severe pneumonia.

**Keywords:** Severe Pneumonia. Mean Platelet Volume. MPV/Platelet Ratio.

## INTRODUCTION

Pneumonia remains one of the leading causes of morbidity and mortality among children worldwide, particularly in developing countries. Severe pneumonia contributes substantially to pediatric hospital admissions and intensive care utilization, especially among children under five years of age. According to the World Health Organization (WHO), pneumonia accounts for a major proportion of childhood deaths despite improvements in immunization, nutrition, and healthcare access. The disease is characterized by inflammation of the lung parenchyma caused by bacterial, viral, or mixed infections, resulting in respiratory distress, hypoxia, and systemic inflammatory responses. Early identification of children at risk of severe disease and poor outcomes is essential for prompt intervention and reduction of mortality.[1]

Several clinical scoring systems and laboratory markers have been evaluated to predict the severity and prognosis of pneumonia in children. Among these, hematological inflammatory markers obtained from routine complete blood count investigations have gained increasing attention because they are inexpensive, rapidly available, and easy to perform even in resource-limited settings. Platelets are now recognized not only for their role in hemostasis but also for their active participation in inflammatory and immune processes. During infections, inflammatory cytokines stimulate platelet production and activation, leading to changes in platelet indices such as platelet count, mean platelet volume (MPV), platelet distribution width, and platelet-to-volume ratios.[2]

Mean Platelet Volume (MPV) represents the average size of circulating platelets and reflects platelet activation and function. Larger platelets are metabolically and enzymatically more active and contain increased prothrombotic and proinflammatory mediators. In severe infections and inflammatory states, activated platelets interact with leukocytes, endothelial cells, and inflammatory mediators, thereby contributing to disease progression. Platelet count and MPV often demonstrate inverse relationships during inflammatory conditions. Therefore, the MPV/Platelet ratio (MPR) has emerged as a potentially useful biomarker for assessing the severity and prognosis of several infectious and inflammatory diseases.[3]

Recent studies have demonstrated the prognostic value of MPV and MPR in adult patients with community-acquired pneumonia, sepsis, ventilator-associated pneumonia, and COVID-19-related pneumonia. Increased MPR has been associated with higher mortality, greater need for intensive care, and worse clinical outcomes. However, studies evaluating the significance of MPV/Platelet ratio in pediatric severe pneumonia are limited. Since complete blood count parameters are routinely measured in hospitalized children, identifying a reliable prognostic marker using these indices may help clinicians stratify risk, predict complications, monitor disease progression, and optimize treatment strategies.[4]

**AIM:** To assess the prognostic significance of MPV/Platelet ratio in children with severe pneumonia aged between 1 month and 18 years.

**Objectives**

1. To evaluate the MPV/Platelet ratio in children admitted with severe pneumonia.
2. To determine the association between MPV/Platelet ratio and severity of pneumonia during hospitalization.
3. To study the complications and clinical outcomes in children with severe pneumonia in relation to MPV/Platelet ratio till discharge.

## MATERIALS AND METHODS

**Source of Data:** The data for the present study were collected from children admitted with severe pneumonia in the Department of Pediatrics at a tertiary care teaching hospital. Clinical details, laboratory investigations, radiological findings, treatment details, complications, and outcomes were recorded using a predesigned structured proforma.

**Study Design:** The present study was a prospective observational study.

**Study Location:** The study was conducted in the Department of Pediatrics of a tertiary care teaching hospital attached to a medical college.

**Study Duration:** The study was conducted over a period of 18 months after obtaining approval from the Institutional Ethics Committee.

**Sample Size:** A total of 135 children diagnosed with severe pneumonia were included in the study.

**Inclusion Criteria**

1. Children aged between 1 month and 18 years.
2. Children admitted with severe pneumonia as per World Health Organization (WHO) criteria.
3. Children whose parents or guardians provided written informed consent for participation in the study.

**Exclusion Criteria**

1. Children with hematological disorders affecting platelet counts or platelet indices.
2. Children with congenital heart disease.
3. Children with chronic liver disease or chronic kidney disease.
4. Children with malignancy or immunodeficiency disorders.
5. Children receiving steroids, chemotherapy, or drugs affecting platelet function.
6. Children with known chronic inflammatory or autoimmune disorders.
7. Children whose parents or guardians refused consent.

**Procedure and Methodology:** All eligible children admitted with severe pneumonia during the study period were enrolled consecutively after obtaining

informed written consent from parents or guardians. A detailed history regarding fever, cough, difficulty breathing, feeding difficulty, cyanosis, lethargy, seizures, and duration of illness was obtained. Demographic information including age, sex, nutritional status, immunization history, birth history, and socioeconomic status was recorded.

A complete general physical examination and systemic examination were performed in all patients. Vital parameters including temperature, respiratory rate, pulse rate, oxygen saturation, blood pressure, and signs of respiratory distress such as chest retractions, nasal flaring, grunting, and cyanosis were documented. Severity assessment was performed using clinical respiratory scoring systems and WHO criteria for severe pneumonia.

Relevant laboratory investigations including complete blood count, platelet count, mean platelet volume, C-reactive protein, blood culture, arterial blood gas analysis, and other investigations whenever clinically indicated were performed at admission. Chest radiography was done in all children to assess pulmonary involvement and complications such as pleural effusion, empyema, consolidation, or lung collapse.

The MPV/Platelet ratio was calculated using the following formula:

$$\text{MPV/Platelet Ratio} = \frac{\text{Mean Platelet Volume (fL)}}{\text{Platelet Count}\left(\times \frac{10^9}{L}\right)}$$

Children were managed according to standard institutional protocols for severe pneumonia including oxygen therapy, intravenous antibiotics, nebulization, intravenous fluids, and ventilatory support whenever required. Patients were monitored throughout hospitalization for development of complications such as respiratory failure, sepsis, shock, pleural effusion, empyema, pneumothorax, acute respiratory distress syndrome, and requirement of pediatric intensive care unit admission.

Clinical outcomes including duration of hospital stay, need for mechanical ventilation, recovery, discharge, and mortality were documented and correlated with MPV/Platelet ratio values.

**Sample Processing:** Approximately 2 mL of venous blood was collected under aseptic precautions in EDTA vacutainer tubes for complete blood count analysis. Samples were processed immediately in the central laboratory using an automated hematology analyzer. Platelet count and mean platelet volume values obtained from the analyzer were recorded. Quality control procedures of the laboratory were maintained throughout the study period to ensure accuracy and reliability of results.

**Statistical Methods:** The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 25.0. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were expressed as frequency and percentages.

Comparison between groups was performed using Student's t-test or Mann-Whitney U test for quantitative variables and Chi-square test or Fisher's exact test for qualitative variables. Correlation between MPV/Platelet ratio and severity parameters was assessed using Pearson's or Spearman's correlation coefficient as appropriate. Receiver Operating Characteristic (ROC) curve analysis was performed to determine the prognostic utility and optimal cutoff value of MPV/Platelet ratio for predicting severe outcomes. A p-value of less than 0.05 was considered statistically significant.

**Data Collection:** Data collection was performed using a structured case record proforma designed specifically for the study. Information regarding demographic profile, clinical presentation, laboratory investigations, radiological findings, treatment details, complications, and outcomes was recorded prospectively for each participant. All collected data were verified regularly for completeness and accuracy before statistical analysis.

## RESULTS

**Table 1: Prognostic Significance of MPV/Platelet Ratio in Children with Severe Pneumonia, n=135**

| Prognostic parameter | MPV/PC <0.03 | MPV/PC ≥0.03 | Total | Test value | 95% CI | p-value |
|---|---|---|---|---|---|---|
| Progression of pneumonia | 5 (9.8%) | 46 (90.2%) | 51 (37.8%) | OR=76.67 | 24.20-242.91 | <0.001 |
| Recovery within 72 hours | 75 (89.3%) | 9 (10.7%) | 84 (62.2%) | | | |
| Total | 80 (59.3%) | 55 (40.7%) | 135 (100%) | | | |
| ROC performance | Cut-off ≥0.03 | AUC=0.868 | Sensitivity=90% | Specificity=90% | PPV=83.64%, NPV=93.75% | <0.001 |

[Table 1] demonstrates the prognostic significance of MPV/Platelet Count (MPV/PC) ratio in children with severe pneumonia. Among the 135 study participants, progression of pneumonia was observed in 51 (37.8%) children, whereas 84 (62.2%) children showed recovery within 72 hours. A markedly higher proportion of children with progression of pneumonia had MPV/PC ratio ≥0.03 [46 (90.2%)] compared to MPV/PC ratio <0.03 [5 (9.8%)]. In contrast, among children who recovered within 72 hours, majority had MPV/PC ratio <0.03 [75 (89.3%)], while only 9 (10.7%) had MPV/PC ratio ≥0.03. This association was found to be highly statistically significant with an odds ratio (OR) of 76.67 (95% CI: 24.20-242.91; p<0.001), indicating that children with higher

MPV/PC ratio had significantly increased risk of disease progression.

Receiver Operating Characteristic (ROC) curve analysis further demonstrated good prognostic performance of MPV/PC ratio at a cut-off value of ≥0.03, with an Area Under Curve (AUC) of 0.868. The sensitivity and specificity were both 90%, while the positive predictive value (PPV) and negative predictive value (NPV) were 83.64% and 93.75% respectively. These findings suggest that MPV/PC ratio is a reliable prognostic marker in children with severe pneumonia.

**Table 2: Evaluation of MPV/Platelet Ratio in Children Admitted with Severe Pneumonia, n=135**

| Variable | MPV/PC <0.03 | MPV/PC ≥0.03 | Total | Test value | 95% CI | p-value |
|---|---|---|---|---|---|---|
| <1 year | 47 (69.1%) | 21 (30.9%) | 68 (50.4%) | $\chi^2$=7.38 | | 0.025 |
| 1-5 years | 27 (54.0%) | 23 (46.0%) | 50 (37.0%) | | | |
| 5-18 years | 6 (35.3%) | 11 (64.7%) | 17 (12.6%) | | | |
| Male | 41 (56.9%) | 31 (43.1%) | 72 (53.3%) | $\chi^2$=0.34 | | 0.560 |
| Female | 39 (61.9%) | 24 (38.1%) | 63 (46.7%) | | | |
| Total | 80 (59.3%) | 55 (40.7%) | 135 (100%) | | | |

[Table 2] shows the evaluation of MPV/Platelet Count ratio according to demographic variables among children admitted with severe pneumonia. Out of 135 children, the majority belonged to the age group of less than 1 year [68 (50.4%)], followed by 1-5 years [50 (37.0%)] and 5-18 years [17 (12.6%)]. Among children aged less than 1 year, most had MPV/PC ratio <0.03 [47 (69.1%)], whereas in the 5-18 years age group, majority had MPV/PC ratio ≥0.03 [11 (64.7%)]. The association between age group and MPV/PC ratio was statistically significant ($\chi^2$=7.38, p=0.025), indicating that higher MPV/PC ratios were more commonly observed in older children.

Regarding gender distribution, males constituted 72 (53.3%) cases and females constituted 63 (46.7%) cases. Among males, 41 (56.9%) had MPV/PC ratio <0.03 and 31 (43.1%) had MPV/PC ratio ≥0.03. Similarly, among females, 39 (61.9%) had MPV/PC ratio <0.03 while 24 (38.1%) had MPV/PC ratio ≥0.03. No statistically significant association was observed between gender and MPV/PC ratio ($\chi^2$=0.34, p=0.560). Overall, 80 (59.3%) children had MPV/PC ratio <0.03, whereas 55 (40.7%) had MPV/PC ratio ≥0.03.

**Table 3: Association Between MPV/Platelet Ratio and Severity of Pneumonia During Hospitalization, n=135**

| Severity parameter | MPV/PC <0.03 | MPV/PC ≥0.03 | Total | Test value | 95% CI | p-value |
|---|---|---|---|---|---|---|
| Severe pneumonia | 10 (30.3%) | 23 (69.7%) | 33 (24.4%) | OR=5.03 | 2.15-11.80 | <0.001 |
| Non-severe pneumonia | 70 (68.6%) | 32 (31.4%) | 102 (75.6%) | | | |
| Total | 80 (59.3%) | 55 (40.7%) | 135 (100%) | | | |
| ROC performance | Cut-off ≥0.03 | AUC=0.67 | Sensitivity=70% | Specificity=65% | PPV=40%, NPV=86.25% | <0.001 |

[Table 3] depicts the association between MPV/Platelet Count ratio and severity of pneumonia during hospitalization. Severe pneumonia was observed in 33 (24.4%) children, whereas 102 (75.6%) children had non-severe pneumonia during hospitalization. Among children with severe pneumonia, majority had MPV/PC ratio ≥0.03 [23 (69.7%)], while only 10 (30.3%) had MPV/PC ratio <0.03. In contrast, among children with non-severe pneumonia, most had MPV/PC ratio <0.03 [70 (68.6%)], whereas 32 (31.4%) had MPV/PC ratio ≥0.03.

The association between elevated MPV/PC ratio and severity of pneumonia was statistically highly significant with an odds ratio of 5.03 (95% CI: 2.15-11.80; p<0.001), indicating that children with MPV/PC ratio ≥0.03 had approximately five times greater risk of developing severe pneumonia during hospitalization.

ROC analysis showed that MPV/PC ratio at a cut-off value of ≥0.03 had moderate predictive ability for severity of pneumonia, with an AUC of 0.67. The sensitivity and specificity were 70% and 65% respectively, while PPV and NPV were 40% and 86.25% respectively.

**Table 4: Complications and Clinical Outcomes in Relation to MPV/Platelet Ratio Till Discharge, n=135**

| Outcome/complication | MPV/PC <0.03 | MPV/PC ≥0.03 | Total | Test value | 95% CI | p-value |
|---|---|---|---|---|---|---|
| PICU stay required | 8 (24.2%) | 25 (75.8%) | 33 (24.4%) | OR=7.50 | 3.04-18.50 | <0.001 |
| PICU stay not required | 72 (70.6%) | 30 (29.4%) | 102 (75.6%) | | | |
| HFNC required | 13 (33.3%) | 26 (66.7%) | 39 (28.9%) | OR=4.62 | 2.09-10.24 | <0.001 |
| HFNC not required | 67 (69.8%) | 29 (30.2%) | 96 (71.1%) | | | |
| Hospital stay, Mean(SD) days | 5.50 (2.45) | 6.33 (2.39) | 5.88 (2.45) | t=1.96 | 0.00-1.66 | 0.054 |
| PICU stay duration, Mean(SD) days | | 3.50 (1.72) | 33 cases | | | |
| HFNC duration, Mean(SD) days | | 2.76 (1.35) | 39 cases | | | |

[Table 4] illustrates the complications and clinical outcomes in relation to MPV/Platelet Count ratio till discharge among children with severe pneumonia. Requirement of Pediatric Intensive Care Unit (PICU) stay was observed in 33 (24.4%) children. Among these, majority had MPV/PC ratio ≥0.03 [25

(75.8%)], whereas only 8 (24.2%) had MPV/PC ratio <0.03. Children with MPV/PC ratio ≥0.03 had significantly higher odds of requiring PICU admission with an odds ratio of 7.50 (95% CI: 3.04-18.50; p<0.001).

Similarly, High Flow Nasal Cannula (HFNC) support was required in 39 (28.9%) children. Of these, 26 (66.7%) children had MPV/PC ratio ≥0.03 and 13 (33.3%) had MPV/PC ratio <0.03. The association between elevated MPV/PC ratio and HFNC requirement was also statistically significant with an odds ratio of 4.62 (95% CI: 2.09-10.24; p<0.001).

The mean duration of hospital stay was higher among children with MPV/PC ratio ≥0.03 [6.33±2.39 days] compared to those with MPV/PC ratio <0.03 [5.50±2.45 days]. However, this difference was not statistically significant (t=1.96, 95% CI: 0.00-1.66; p=0.054). Among children requiring PICU admission, the mean PICU stay duration was 3.50±1.72 days, while the mean duration of HFNC support was 2.76±1.35 days.

## DISCUSSION

In the present study, MPV/Platelet Count ratio showed strong prognostic significance in children with severe pneumonia. Among children who showed progression of pneumonia, 46 (90.2%) had MPV/PC ratio ≥0.03, whereas only 5 (9.8%) had MPV/PC ratio <0.03. In contrast, among children who recovered within 72 hours, the majority had MPV/PC ratio <0.03 [75 (89.3%)]. This association was highly significant (OR=76.67, 95% CI: 24.20-242.91; p<0.001). ROC analysis showed that MPV/PC ratio ≥0.03 had good prognostic accuracy with AUC 0.868, sensitivity 90%, specificity 90%, PPV 83.64%, and NPV 93.75%. This suggests that MPV/PC ratio may be a useful early marker for predicting progression in children with severe pneumonia. Cho et al,[1] (2013) similarly reported that higher MPV/Platelet ratio was associated with increased short-term mortality in community-acquired pneumonia. Farghly et al,[2] (2017) also observed that changes in MPV were significantly associated with mortality and morbidity in pneumonia patients. Ari et al. (2025),[3] further demonstrated that novel hematological ratios including MPV-based indices had significant prognostic utility in critically ill pediatric pneumonia patients. Kiani et al. (2024),[4] also found that elevated MPV was significantly associated with severe community-acquired pneumonia in children and could predict unfavorable outcomes.

In the present study, age-wise distribution showed that MPV/PC ratio ≥0.03 was more frequent in older children, particularly in the 5-18 years age group [11 (64.7%)], while children aged less than 1 year more commonly had MPV/PC ratio <0.03 [47 (69.1%)]. This age-wise association was statistically significant ($\chi^2$=7.38; p=0.025). However, gender showed no significant association with MPV/PC ratio, as 31 (43.1%) males and 24 (38.1%) females had MPV/PC ratio ≥0.03 (p=0.560). Elsayed et al. (2020),[5] reported that MPV and MPV/platelet ratio were useful markers in pediatric pneumonia severity, supporting the present finding that platelet indices may vary with clinical severity rather than gender. Korniluk et al. (2019),[6] also emphasized that MPV is influenced by inflammatory burden and platelet activation, which may explain its variation across clinical subgroups. Chiheri et al (2020),[7] similarly observed that MPV and platelet/lymphocyte ratio were associated with increasing severity of acute respiratory infections in children and reflected inflammatory activity during hospitalization. Şahin et al (2017),[8] found significantly altered platelet parameters in children with pneumonia compared to healthy controls, supporting the role of platelet indices as inflammatory markers in pediatric respiratory infections.

In relation to pneumonia severity, the present study showed that among children with severe pneumonia during hospitalization, 23 (69.7%) had MPV/PC ratio ≥0.03 compared to 10 (30.3%) with MPV/PC ratio <0.03. Children with MPV/PC ratio ≥0.03 had nearly five times higher odds of severe pneumonia (OR=5.03, 95% CI: 2.15-11.80; p<0.001). ROC analysis showed AUC 0.67, sensitivity 70%, specificity 65%, PPV 40%, and NPV 86.25%, indicating moderate predictive ability for severity. Zhong et al (2021),[9] observed that elevated MPV/Platelet ratio was an independent risk factor for severe COVID-19 pneumonia, with good predictive value for severity. Similarly, Ilban et al (2019),[10] found that MPV and MPV/platelet ratio were useful prognostic indicators in ventilator-associated pneumonia. Ling et al (2021),[11] also demonstrated that platelet-related hematological parameters had significant predictive value in refractory Mycoplasma pneumoniae pneumonia in children. Wang et al (2023),[12] further reported that platelet-related parameters combined with pneumonia severity index score improved prediction of mortality in severe pneumonia patients.

The present study also demonstrated significant association between elevated MPV/PC ratio and adverse clinical outcomes. PICU stay was required in 33 (24.4%) children, of whom 25 (75.8%) had MPV/PC ratio ≥0.03. The odds of PICU admission were significantly higher in children with MPV/PC ratio ≥0.03 (OR=7.50, 95% CI: 3.04-18.50; p<0.001). Similarly, HFNC support was required in 39 (28.9%) children, and 26 (66.7%) of them had MPV/PC ratio ≥0.03, showing significant association (OR=4.62, 95% CI: 2.09-10.24; p<0.001). The mean hospital stay was also higher in the MPV/PC ≥0.03 group compared to the MPV/PC <0.03 group (6.33±2.39 vs 5.50±2.45 days), though this difference was borderline non-significant (p=0.054). Yardan et al (2016),[13] and Ho et al (2017),[14] found that platelet indices and MPV/platelet ratio were associated with severity and risk stratification in pulmonary embolism and sepsis, supporting their role

as prognostic markers in respiratory illness. Güzel et al (2017),[15] also reported that CRP/MPV ratio was a useful biomarker for assessing severity of community-acquired pneumonia in children. Dursun et al (2018),[16] demonstrated that MPV and neutrophil-to-lymphocyte ratio were valuable predictors of sepsis in children, which is consistent with the present findings where higher MPV/PC ratio was linked to progression, PICU requirement, and respiratory support.

## CONCLUSION

The present prospective observational study demonstrated that MPV/Platelet Count (MPV/PC) ratio is a useful and significant prognostic marker in children with severe pneumonia. Children with elevated MPV/PC ratio (≥0.03) showed significantly higher risk of progression of pneumonia, severe disease during hospitalization, requirement of PICU admission, and need for advanced respiratory support such as High Flow Nasal Cannula (HFNC). Higher MPV/PC ratio was strongly associated with poor clinical outcomes, while lower MPV/PC ratio was associated with early recovery within 72 hours.

ROC analysis revealed that MPV/PC ratio had good prognostic accuracy with high sensitivity and specificity for predicting disease progression and adverse outcomes. Since MPV and platelet count are routinely available from complete blood count investigations, MPV/PC ratio can serve as a simple, inexpensive, rapid, and easily accessible biomarker for early risk stratification in children with severe pneumonia.

Thus, MPV/PC ratio may help clinicians identify high-risk patients at an early stage, enabling timely intensive monitoring and appropriate management to improve clinical outcomes and reduce morbidity associated with severe pediatric pneumonia.

**Limitations Of Study**

1. The study was conducted at a single tertiary care center, limiting generalizability of the findings to the wider population.
2. The sample size was relatively small, which may affect the strength of statistical associations.
3. Follow-up was limited only till discharge, and long-term outcomes were not evaluated.
4. Etiological confirmation of pneumonia (viral, bacterial, or mixed infection) was not performed in all cases.
5. Serial measurements of MPV/Platelet ratio during the course of illness were not assessed.
6. Other inflammatory biomarkers such as procalcitonin, IL-6, and serum lactate were not compared with MPV/PC ratio.
7. Pre-analytical and analytical variations affecting MPV measurements could not be completely eliminated.
8. Nutritional status and underlying subclinical inflammatory conditions may have influenced platelet indices.
9. The study did not evaluate the effect of different treatment modalities on MPV/PC ratio.
10. Multicentric studies with larger populations are required to validate the prognostic utility and establish standardized cutoff values for MPV/PC ratio in pediatric severe pneumonia.

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