

PREDICTION MODELS OF SEVERE DENGUE USING COMPLETE BLOOD COUNT INDICES ACROSS FEBRILE AND CRITICAL PHASES IN PEDIATRIC PATIENTS ADMITTED AT THE PHILIPPINE CHILDREN'S MEDICAL CENTER FROM 2016 TO 2019

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INTRODUCTION

CBC is universally monitored in dengue. Unlocking its potential to predict severity progression would greatly improve outcomes in dengue management.

OBJECTIVES

- ❑ To explore CBC indices across days of illness that may predict progression to severe dengue in children
- ❑ To determine optimal cutoff values of CBC indices predictive of severity

METHODOLOGY

A retrospective, analytical, observational, cohort study was conducted through chart review of dengue cases admitted in PCMC within 2016-2019. Daily CBC indices were analyzed. Optimal cutoff values were determined using area under the receiver operating characteristic curve.

CBC INDEX	DAY OF ILLNESS	DWS	SEVERE	MEAN DIFF (95% CI)
WBC	D3	3.67±1.33	5.67 ±3.53	-2.00 (-3.61 to -0.40) <i>p</i> = 0.016
	D4	3.37±1.59	4.51 ±3.11	-1.14 (-1.99 to -0.29) <i>p</i> = 0.009
Optimal cutoff value on Day 4 WBC > 3.33 x 10⁹/L (AUC of 0.67)				
NLR	D5	0.97±0.74	1.28 ±0.93	-0.31 (-0.61 to -0.02) <i>p</i> = 0.037
	D6	0.80±1.09	1.36 ±2.09	-0.56 (-1.08 to -0.04) <i>p</i> = 0.035
	D7	0.58±0.45	1.28 ±2.86	-0.69 (-1.14 to -0.25) <i>p</i> = 0.003
Optimal cutoff value on Day 4 NLR > 0.93 (AUC of 0.63)				
MLR	D7	0.18±0.08	0.26 ±0.42	-0.08 (-0.15 to -0.01) <i>p</i> = 0.024
PLR	D3	136.69± 70.39	85.18 ±30.91	51.52 (6.43 to 96.60) <i>p</i> = 0.026

Keywords: Neutrophil-lymphocyte ratio, leukocytosis in dengue, dengue severity predictors, CBC in dengue

RESULTS

Two-hundred eighty-seven laboratory-confirmed dengue with warning signs (DWS) patients were included, 22% progressed to severe dengue. High WBC and neutrophil-lymphocyte ratio (NLR) on Day 4 of illness significantly predicted progression to severe dengue. Monocyte-lymphocyte ratio (MLR), platelet-lymphocyte ratio (PLR), platelet count, hematocrit, and absolute monocyte levels had poor discriminative power.

CONCLUSION AND RECOMMENDATIONS

WBC and NLR values in the early phase may predict progression to severe dengue. However, recommendation as predictors of severity progression remains weak. Studies with larger samples may determine the true predictive values of WBC, NLR, and other CBC indices.