

Blood cytometry, neutrophil-lymphocyte index and platelet-lymphocyte index in children with high-risk pathologies and COVID-19

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Abstract

ABSTRACT Background: The emergence of new SARS-CoV-2 variants is increasing pediatric COVID-19 cases. The blood cytometry (BC) values, neutrophil-lymphocyte index (NLI), and platelet-lymphocyte index (PLI) reflect inflammatory response intensity. The aim was to evaluate if BC, NLI, and PLI are predictors of the COVID-19 severity in children with high-risk pathologies. Methods: A retrospective nested case-control study of 60 pediatric patients with COVID-19 was carried out to evaluate the relationship of BC, NLI, and PLI with clinical status at the COVID area discharge. Patients with a severe or critical condition at discharge and those who died during hospitalization were classified as cases. Asymptomatic patients or those with a mild to moderate disease at discharge were considered controls. We used absolute frequencies, percentages, medians, ranges, X2 test, Fisher's exact test, and Odds Ratio with 95% CI for statistical analysis. Results: We included 32 male and 28 female patients, median age of 6.5 years (range 0-14). All had high-risk diseases, such as Leukemia (64.4%), Down syndrome and Leukemia (8.8%), or a solid neoplasm (13.3%). Seventeen (28.3%) were cases and 43 (71.7%) controls. Fourteen (23.3%) died. No BC value was associated with illness severity, except for thrombocytosis (OR 6.30, 95% CI 1.03-38.48, $p=0.048$). Erythropenia was identified as a protective factor for illness severity (OR 0.18, 95% CI 0.03-0.86, $p=0.034$). Conclusion: A decrease in different BC values was the most frequent abnormality. Thrombocytosis was associated with COVID-19 severity. These results may apply to children with high-risk pathologies such as those in this series.

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Abbreviations key

BC	Blood cytometry
NLI	Neutrophil-lymphocyte index
PLI	Platelet-lymphocyte index
IFN	Interferon
NET	Neutrophils extracellular traps
IL	Interleukin
PIMS	Pediatric Inflammatory Multisystemic Syndrome

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