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abstract

Role of Plasma Lactate as a Biochemical Marker Predicting the Severity of Febrile Neutropenia in Children with Cancer: A Prospective Study

Siddhartha Dodda, Navya Malisetty, Sreerama Krishnaian, Sreerama Krishnaian, Pallavi Ladda, Veerenra Patil

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Role of Plasma Lactate as a Biochemical Marker Predicting the Severity of Febrile Neutropenia in Children with Cancer: A Prospective Study

Authors: Siddhartha Dodda, Navya Malisetty, Sreerama Krishnaian, Sreerama Krishnaian, Pallavi Ladda, Veerenra Patil

Affiliation: Basavatarakam Indo American Cancer Hospital and Research Institute, Hyderabad, Telangana State, India

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Introduction: Febrile neutropenia (FN) is one of the major reasons for high morbidity and mortality in children with cancer on chemotherapy. It is more in low and middle income countries like India where supportive services are limited. Hence there is a need to identify an objective marker to predict severity of sepsis in children with FN. Overwhelming infections with microorganisms in the blood lead to circulatory failure and inadequate tissue perfusion, altering the acid-base homeostasis which is reflected by elevated plasma lactate levels. Our study aims to assess plasma lactate levels as a surrogate marker for assessing severity of sepsis in febrile neutropenic children.

Methodology: Plasma lactate levels were obtained at 0 and 24 hours in hemodynamically stable children with FN. Patients were monitored for pulse rate, respiratory rate, blood pressure, CNS status, urine output and outcomes.

Reults: Among 134 children treated for FN, plasma lactate was elevated above 2 mmol/L in 50 children (37%), among which 30 (60%) experienced clinical deterioration necessitating escalation of therapy. In contrast, only 16 children (19%) with lactate levels ≤2 mmol/L experienced similar deterioration. (p=<0.05, statistically significant). Receiver operating characteristic (ROC) curve shows plasma lactate 20 hrs has good predictability for need for escalation of therapy with Area Under the Curve (AUC) being 0.7. Youden's index shows 2.05 as the cutoff, which has diagnostic accuracy of 73% with Positive Predictive Value (PPV) and Negative Predictive Value (NPV) as 77% and 65% respectively.

Conclusion: Elevated plasma lactate levels at presentation in a hemodynamically stable children with FN may indicate increased risk of clinical deterioration requiring escalation of therapeutic strategies.