Comparison Of Bone Profile Based on Risk Stratification in Children with Acute Lymphoblastic Leukemia at Adam Malik Hospital

Pramulya Prajogo
Department of Child Health, Faculty of Medicine, Universitas Sumatera Utara Medan, Indonesia

Siska Mayasari Lubis
Department of Child Health, Faculty of Medicine, Universitas Sumatera Utara Medan, Indonesia

Olga Rasi, Isti Ilmiati Fujianti
Department of Community Medicine, Universitas Sumatera Utara, Medan, Indonesia

Tiangsa Sembiring
Department of Child Health, Faculty of Medicine, Universitas Sumatera Utara Medan, Indonesia

Abstract:

Background: Acute lymphoblastic leukemia (ALL) represents the most frequent malignancy in childhood. Although survival outcomes have markedly improved, attention has shifted toward treatment-related complications, including disturbances in bone metabolism. Differences in treatment intensity according to risk stratification may contribute to variations in bone biochemical parameters.

Objective: To evaluate differences in bone biochemical profiles between standard-risk and high-risk children with ALL treated at Adam Malik Hospital

Methods: A cross-sectional analytical study was conducted using retrospective medical records of 50 pediatric patients diagnosed with ALL. Patients were classified into standard-risk and high-risk groups based on established treatment protocols. Serum levels of calcium, magnesium, phosphate, alkaline phosphatase (ALP), and 25-hydroxyvitamin D were analyzed. Statistical comparisons were performed using independent t-test or Mann–Whitney test according to data distribution.

Results: Children in the high-risk group showed significantly lower levels of calcium (p=0.036), magnesium (p=0.049), phosphate (p=0.009), and vitamin D (p=0.005) compared with the standard-risk group. No statistically significant difference was observed in ALP levels (p=0.214). A longer duration of glucocorticoid exposure was also noted in the high-risk group (p=0.036).

Conclusion: High-risk pediatric ALL patients exhibit greater alterations in bone biochemical parameters, particularly in magnesium, phosphate, and vitamin D levels.

Keywords:

Acute lymphoblastic leukemia, risk stratification, bone metabolism, vitamin D, pediatrics.