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abstract

Frequency and Factors Influencing 6-Mercaptopurine Induced Grade 4 Neutropenia in Children with Acute Lymphoblastic Leukemia during Maintenance Therapy in Bangabandhu Sheikh Mujib Medical University

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abstract

Frequency and Factors Influencing 6-Mercaptopurine Induced Grade 4 Neutropenia in Children with Acute Lymphoblastic Leukemia during Maintenance Therapy in Bangabandhu Sheikh Mujib Medical University

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Introduction: Severe neutropenia; particularly grade 4 neutropenia is associated with 6-mercaptopurine (6 MP) in the maintenance phase of Acute lymphoblastic leukemia (ALL). This study aimed to assess the frequency of 6MP-induced grade 4 neutropenia during the first six months of maintenance therapy in children with ALL.

Methodology: This prospective observational study was conducted over 12 months on 40 pediatric ALL patients enrolled through consecutive sampling. Each patient received 6MP orally at a 75 mg/m2/day dose, starting from the maintenance therapy phase. Complete blood counts were performed at baseline and every four weeks unless clinically indicated over the first six months of therapy to monitor hematological markers. Data on family demographics, risk stratification, treatment regimen, and reported adverse events were collected during the maintenance phase. Information was gathered using a pre- tested structured questionnaire, and the data were analyzed.

Results: The mean age of participants was 7.51 years, with 60% above six years old. The gender distribution revealed males and females were 55% & 45% respectively. Undernourished patients were 52.5%. Adverse effects were significant, with 100% experiencing anorexia and hematological issues, including anemia, neutropenia, leucopenia, and thrombocytopenia. The frequency of grade 4 neutropenia increased progressively in each follow-up; was 12.5%, 20%, and 25% accordingly and peaking at 37.5% during the fourth follow-up. The child's age (p-value 0.025), and nutritional status (p-value 0.038) were significantly associated with grade 4 neutropenia. During follow-up 95% of participants experienced neutropenic fever, 70% required dose discontinuation, and 17.5% needed admissions.

Conclusion: This study reveals a progressively increased frequency of 6MP-induced grade-4 neutropenia among children with ALL during the first six months of maintenance therapy.

Additionally, the analysis identified younger age, nutritional status, and standard risk as key factors influencing the risk of grade 4 neutropenia, highlighting the necessity for a comprehensive approach to patient management.