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abstract

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**Sameh Awwad, Fahad Almanjomi, Murtada
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Peg-Asparaginase Associated Toxicities in Children with Acute Lymphoblastic Leukemia

Authors: Sameh Awwad, Fahad Almanjomi, Murtada Alsultan, Mohammad Alomtari, Rawan Abulnasr

Affiliation: King Fahad Medical City, Riyadh

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Introduction: Leukemia is the most prevalent type of cancer affecting children, representing approximately 35% of cancer diagnoses in Saudi Arabia. Notably, significant improvement in the overall survival and cure rates for pediatrics with acute lymphoblastic leukemia (ALL) has been attributed to adding asparaginase to the chemotherapy regimen. However, the administration of these agents may lead to a range of toxicities that often alter treatment outcomes.

The study aimed to characterize the prevalence of common toxicities related to polyethylene glycol (PEG) asparaginase in children aged 0-14 years diagnosed with ALL. Additionally, it assessed the types of toxicities associated with intravenous (IV) and intramuscular (IM) administration of Peg-Asparaginase.

Methodology: It was an observational retrospective cross-sectional study. Data was extracted from the hospital's electronic health record (EPIC). Using EPIC, we reviewed medical charts of all pediatric patients below 14 years old diagnosed with ALL who received at least one dose of PEG-asparaginase between January 2020 and March 2023. The toxicity grading was based on the National Cancer Institute Common Terminology Criteria for Adverse Events (CTCAE).

Results: One hundred and ninety-one patients with ALL were included in the study. Overall, 79 toxicity episodes were experienced by the study patients. Anaphylaxis/hypersensitivity (36.7%) and hepatotoxicity (31.6%) were the most prevalent toxicities reported, followed by pancreatitis and hyperglycemia (12.7% each).

According to the CTCAE grading, approximately 70% of toxicities were categorized as Grade 3 and 4. Notably, 60% of the events occurred during the induction and consolidation phase of therapy. Interestingly, there was no significant difference in rates of toxicities between patients receiving IV or IM PEG-asparaginase.

Conclusion: The distribution of toxicities highlighted in our study aligns with findings from previously published studies. Furthermore, multivariate analysis indicated that patients with high-risk ALL and TALL were more likely to develop toxicities compared to other forms of ALL.