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ANALYSIS OF PEG-ASPARAGINASE ASSOCIATED ADVERSE EVENTS IN THE TREATMENT OF PEDIATRIC ACUTE LYMPHOBLASTIC LEUKEMIA

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BACKGROUND

Peg-Asparagninase (Peg-Asp) is an essential part of the treatment for pediatric acute lymphoblastic leukemia (ALL). Peg-Asp administration is associated with serious complications, including hypersensitivity reactions, liver toxicity, coagulation abnormalities, and pancreatitis. The aim of this study is to examine the frequency and severity of adverse events experienced by children who received Peg-Asp.

METHOD

We conducted a retrospective analysis of ALL pediatric patients aged 1-18 years treated according to the ALL-IC BFM 2009 protocol at the Pediatric Cancer and Blood Disorders Center of Armenia between January 2019 and December 2021.

RESULTS

In the study, 49 patients received Peg-Asp (2500U/m2) during treatment, including Induction (2 doses at a 2-week interval), HR intensive block (6 doses), and delayed intensification (1 dose). Hypersensitivity reactions were significant adverse events, with 11 patients (22%) experiencing them. Among them, 8 had grade 2-3 reactions during the test dose, 2 after the full dose, and 1 during the main dose injection. Four patients were excluded from either induction and post-induction due to Peg-Asp allergy. Hypofibrinogenemia was observed in the majority during induction (97.7% or 44/45) and post-induction phases (31.7% or 13/41). Patients with hypofibrinogenemia received 145 infusions of fresh frozen plasma during induction and 14 during post-induction. During the induction phase, 22.2% (10/45) of patients experienced grade 3-4 hepatotoxicity, while hyperbilirubinemia affected 33.3% (15/45), hypoalbuminemia 24.5% (11/45), thrombosis 4.4% (2/45), and coagulopathy 28.5% (14/45). In the post-induction phase, grade 3-4 hepatotoxicity increased to 31.1% (14/41), hyperbilirubinemia decreased to 7.3% (3/41), hypoalbuminemia persisted in 26.8% (11/41), thrombosis was present in 4.8% (2/41), and coagulopathy affected 19.5 % (8/41). In our cohort, no cases of Peg-Asp-associated pancreatitis were observed. Only three patients experienced a slight elevation in amylase levels, which resolved within 2-3 days.

CONCLUSIONS

Allergy to Peg-Asp occurred early in treatment. The most common adverse event in the induction phase was hypofibrinogenemia, followed by hyperbilirubinemia, coagulopathy, and hepatotoxicity. In the post-induction phase, hepatotoxicity was more prevalent, along with hypofibrinogenemia and coagulopathy. Hypoalbuminemia and thrombosis showed similar incidences in both groups.

REFERENCES

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