3.7.4 Erwinia Asparaginase Module

Original Date	Next Review Date	Last Revision Date(s)
October 2018	December 2024	December 2022

Classification

Antineoplastic, Miscellaneous

Indications, Contraindications and Dosing

Indications

Acute lymphoblastic leukemia and lymphoma, Acute myeloid leukemia

Erwinia asparaginase is used as the first-line drug in some protocols; however, it is generally used when patients have experienced an anaphylactic reaction to Peg-asparginase or pegaspargase (which is the upfront therapy in most L&L protocols).

Erwinia asparaginase has a half-life of 16 hours.

Contraindications

Asparaginase is contraindicated with a history of severe pancreatitis with prior asparaginase therapy, serious thrombosis with prior asparaginase therapy or serious hemorrhagic events with prior asparaginase therapy.

Asparaginase may affect coagulation factors and predispose to bleeding and/or thrombosis. Caution should be used when administering any concurrent anticoagulant therapy.

Erwinia Asparaginase Dose

Dose is protocol-based and may range from 10,000 units/m^2 to 25,000 units/m^2.

If Erwinia is used due to an allergic reaction to Pegaspargase, the usual dosing is: 25,000 units/m^2 three times per week x six doses. (Note: Six doses of 25,000 units/m^2 of Erwinia replaces one dose of Pegaspargase.)

Erwinia is started on a Monday and given on a Monday, Wednesday and Friday schedule.

***Dose may differ according to protocol. Follow protocol instructions.**

Pharmacy Considerations

Reconstitution	Refrigerate. Do NOT freeze. Please follow product reconstitution guidelines or contact a specialized childhood cancer program pharmacist for guidance.
Stability	For IV administration: stable at room temperature for 4 hours.

	For IM administration: stable at room temperature for 4 hours. Due to short stability time, pharmacy will need to prepare the drug when informed by RN that patient is on unit and has met all parameters to receive the drug. The solution does not contain any preservatives.
Compatibility	0.9% NaCl **DO NOT** mix with other drugs.
Pre-Medications	Please consult the specialized childhood cancer program regarding pre-medication as it may be given prior to administration to decrease risk of allergic reaction.

Pediatric Administration

Sub-cutaneous	NO
Intramuscular (IM)	YES, inject into a large muscle **Maximum 2 mL per injection site**
Intravenous Direct (IV)	YES (not routinely ordered this way, preferred route is IV infusion or IM)
IV Intermittent Infusion	YES, in 100 mL 0.9% NaCl over 1-2 hours
IV Continuous Infusion	NO

THIS MEDICATION IS TO BE ADMINISTERED BY A CHEMO-TRAINED NURSE.

IF THE NURSE IS NOT CHEMO-TRAINED, THEY ARE TO CONTACT THE UNIT NURSE EDUCATOR OR THE POGO SATELLITE NURSE COORDINATOR.

Nursing Considerations

- NON-VESICANT drug
- Baseline CBC, temperature, heart rate, respiratory rate and blood pressure

Increased emetogenetic potential when given IV versus IM. Recommend antiemetic prior to each dose.

A hypersensitivity reaction can occur immediately. Symptoms may include hypotension, dyspnea, rash, urticaria, vomiting, fever and chills. Have medications to treat hypersensitivity reactions readily available at each administration, including epinephrine, antihistamines, oxygen and steroids.

In general, transfusion should be avoided on days Erwinia is administered. If circumstances don't allow for delay in transfusion (i.e. platelets needed to facilitate IM injection) please contact the referring team to discuss options.

Intramuscular (IM) administration only: Platelet count must be >20,000 for IM administration. Be aware of increased risk of allergic reaction. NOTE: Anaphylaxis may be delayed following IM injection.

Intravenous (IV) administration only: RN must stay in the room for the first 15 minutes of IV Erwinia infusion and closely monitor patient until the infusion is complete.

Patient should remain in the clinic for a minimum of one hour following IM/IV administration.

Repeat vitals. Provide family education prior to discharge regarding delayed reaction, side effects and where to report issues.

Potential Hazards of Parenteral Administration

Immediate (within a few minutes to hours):

- Anaphylaxis, other allergic reactions (urticaria, pruritus, respiratory distress, hypotension, chills, fever)
- Nausea and vomiting – very common with IV administration, less with IM
- Pain/bruising at injection site – hold site at least 5 minutes after injection or until bleeding stops. Apply ice if platelet counts low.

Delayed (within a few days to weeks)

- Hepatotoxicity – hypoalbuminemia, increased transaminases, decreased fibrinogen, clotting factors, antithrombin (risk of hemorrhage or thrombosis possible)
- Hyperglycemia – monitor urine/blood glucose. May require insulin.
- Pancreatitis – elevated serum amylase, assess for abdominal tenderness
- Thrombosis and bleeding (CNS and non-CNS)

Specialized childhood cancer program should be notified of adverse effects of medication.

Disclaimer: This document is meant for guidance. Nothing in this document replaces clinical judgement or dictates treatment of individual patients. The information found here will be reviewed every two years.

This guidance document was developed by Mr. Graham Robinson, Children's Hospital of Eastern Ontario and Mr. Kaniska Young Tai, The Hospital for Sick Children, in consultation with Ms. Melanie Harvey and Ms. Jennifer Drynan, The Hospital for Sick Children, Ms. Virginia Cyr, Children's Hospital of Eastern Ontario, Ms. Mary Jo De Courcy and Ms. Diana Masse, Children's Hospital, London Health Sciences Centre, and Ms. Christina McCauley, POGO/The Hospital for Sick Children, based on the sources below.

References

1. The Hospital for Sick Children Division of Hematology/Oncology Chemotherapy Administration Standards Version 10 December 2021.
2. CHEO Parenteral Drug Administration Monograph.
3. London Health Sciences Centre Parenteral Drug Administration Monograph.
4. Woods D, Winchester K, Towerman A, et al. From the Children's Oncology Group: Evidence-Based Recommendations for PEG-Asparaginase Nurse Monitoring, Hypersensitivity Reaction Management, and Patient/Family Education. Journal of Pediatric Oncology Nursing. 2017; 34(6):387-396. doi:10.1177/1043454217713455

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Record of Updates

Version Number	Date of Effect	Summary of Revisions
1	12/15/2022	• Original version posted.