The Ohio State University College of Pharmacy
DRUG INFORMATION RESPONSE FORM

Requested by: Emma Stojova, PharmD, RPh		**Title:** Emergency Medicine Clinical Pharmacist	
Contact Info	Phone: 32474	Email: emilija.stojova@osumc.edu	Address: OSUWMC ED
Received by: Kaeli Singer	**Date Received:** 03/02/2022	**Date Returned:** 03/08/2022	

Question: In the management of anaphylaxis, where can glucagon be effectively used?

Time Spent to Answer Question: 2 hours

Response provided by: Kaeli Singer, PharmD Candidate 2022

Please provide response below (with citations) or attach response to this sheet:

Glucagon is a peptide hormone that stimulates adenylate cyclase to produce increased cyclic AMP which increases hepatic glycogenolysis and gluconeogenesis. Because of this mechanism of action, glucagon is most commonly used in the setting of hypoglycemia to increase blood sugar.[1] However, the increase in cyclic AMP also increases myocardial contractility and peripheral vasodilation.[1-3] In the treatment of anaphylactic reactions, intramuscular epinephrine is the medication of choice in that it has alpha and beta adrenergic properties.[4] However, many patients in the United States take beta-blockers for various conditions. When epinephrine is administered in the setting of anaphylaxis in patients who take beta blockers, the beta effects of epinephrine may be diminished and the patient may enter into refractory anaphylaxis.[2] In these patients, glucagon is a medication that can be used to bypass the beta receptors and directly activate adenylyl cyclase, improving overall response.[2] To note, rapid administration of glucagon can cause emesis and airway precautions should be in place to prevent possible aspiration.[2,3]

While there is somewhat thorough data surrounding the utilization of glucagon for the treatment of anaphylaxis in patients on beta blockers, there is less data on the use of glucagon in refractory anaphylaxis without beta blocker use. However, a few articles have found that the use of glucagon may be useful in non-beta blocker patients as well. Because of the same reason that glucagon bypasses alpha and beta receptors and directly increases cyclic AMP, glucagon may be useful in treating patients with refractory hypotension or bronchospasm in the setting of anaphylaxis. In this situation, the recommended dose of glucagon is 1-5 mg intravenously administered over 5 minutes, followed by an infusion of 5-15 mcg/min, titrated to clinical response.[5]

References

1. Glucagon. Lexi-Drugs. Lexicomp. Wolters Kluwer. Hudson, OH. Available at: https://online.lexi.com. Accessed March 7, 2022.
2. Tanno LK, Alvarez-Parea A and Pouessel G. Therapeutic approach of anaphylaxis. Curr Opin Allergy Clin Immunol. 2019; 19(4):393-491. doi:10.1097/ACI.0000000000000539.
3. Kemp AM and Kemp SF. Pharmacotherapy in refractory anaphylaxis: when intramuscular epinephrine fails. Curr Opin Allergy Clin Immunol. 2014; 14(4):371-378. doi:10.1097/ACI.0000000000000080.
4. Epinephrine (systemic). Lexi-Drugs. Lexicomp. Wolters Kluwer. Hudson, OH. Available at: https://online.lexi.com. Accessed March 7, 2022.
5. Campbell RL, Li JTC, Nicklas RA and Sadosty AT. Emergency department diagnosis and treatment of anaphylaxis: a practice parameter. Ann Allergy Asthma Immunol. 2014; 113(6):599-608. doi:10.1016/j.anai.2014.10.007.

Resources Used:

- ☐ Micromedex
- ☑ Lexi-Comp
- ☐ Drug Facts & Comparisons
- ☐ AHFS Drug Information
- ☐ Dipiro's Pharmacotherapy
- ☐ Clinical Key
- ☐ Brigg's Drugs in Pregnancy & Lactation
- ☐ Trissel's Handbook on Injectable Drugs
- ☐ Natural Medicines Comprehensive Database
- ☐ National Guidelines:
- ☑ Pubmed (search terms): Glucagon and anaphylaxis
- ☐ International Pharmaceutical Abstracts (search terms):
- ☐ Internet:
- ☐ Other: