PERIOPERATIVE ANAPHYLAXIS – NEUROMUSCULAR BLOCKADE VERSUS ANTIBIOTICS

Charles Kent Miller, MD, Samuel Weiss, MD, and Kevin White, MD*

Wilford Hall Ambulatory Surgical Center, Joint Base San Antonio – Lackland AFB, TX

*The opinions or assertions herein are the private views of the authors and are not to be construed as reflecting the views of the Department of the Air Force or the Department of Defense.

INTRODUCTION:

- Perioperative anaphylaxis is associated with substantial morbidity and mortality, and can often be a diagnostic challenge due to multiple medications being given simultaneously.
- Literature from the United States cite antibiotics as the most common cause of perioperative anaphylaxis, while European reports cite neuromuscular blocking agents.
- We present a case of perioperative anaphylaxis and the workup to determine the causative agent.

CASE DESCRIPTION:

- A 45-year-old male developed symptoms consistent with anaphylaxis while being prepared for an emergency appendectomy.
- In preparation for surgery he received piperacillin/tazobactam, succinylcholine, fentanyl, and propofol. Before the incision was made, he developed tachycardia, hypotension, urticaria, and wheezing.
- Anaphylaxis was identified and he was treated with epinephrine, albuterol, and diphenhydramine; the surgery was aborted and he was transferred to the surgical intensive care unit for stabilization.
- Many possible causative agents were considered including succinylcholine, piperacillin/tazobactam, propofol, latex, fentanyl, and chlorhexidine.

CASE DESCRIPTION:

- Based on the patient's history of tolerance to numerous other beta-lactams (including amoxicillin and penicillin six months prior to surgery, and ceftriaxone given within 24-hours of surgery) the suspected agent was succinylcholine.
- Skin prick testing and intradermal testing was completed for penicillin , piperacillin/tazobactam, and succinylcholine.

SKIN-PRICK TESTING:

AGENT	CONCENTRATION	WHEAL	FLARE
Negative Control		0	5
Positive Control		10	46
Pre-Pen®	Full strength	0	8
Pen G	10,000 unit/mL	5	10
MDM 10-2	Full strength	0	8
Piperacillin/tazobactam	20mg/mL	6	20
Succinylcholine	10mg/mL	0	7

INTRADERMAL TESTING – PENICILLIN:

AGENT	CONCENTRATION	WHEAL	FLARE
Negative Control		0	0
Positive Control		22	39
Pre-Pen®	Full strength	15	45
Pen G	10,000 unit/mL	12	47
MDM 10-2	Full strength	4	40

Intradermal testing was positive to all penicillin components.

INTRADERMAL TESTING – PIPERACILLIN/TAZOBACTAM:

AGENT	CONCENTRATION	WHEAL	FLARE
Negative Control		0	0
Positive Control		22	39
Piperacillin/tazobactam	0.2 mg/mL	11	34
Piperacillin/tazobactam	2 mg/mL	*	*
Piperacillin/tazobactam	20 mg/mL	*	*

Intradermal testing was positive to lowest concentration of piperacillin/tazobactam
Higher concentrations were not tested

INTRADERMAL TESTING – SUCCINYLCHOLINE:

AGENT	CONCENTRATION	WHEAL	FLARE
Negative Control		0	0
Positive Control		22	39
Succinylcholine	1 mcg/mL	0	0
Succinylcholine	10 mcg/mL	0	0
Succinylcholine	100 mcg/mL	11	34

Testing was challenging because intradermal testing to succinylcholine was also positive at the maximum concentration.

TESTING SUMMARY:

- Skin Prick testing was positive to Pen G and Piperacillin/tazobactam
- Intradermal testing was positive to all penicillin components and to piperacillin/tazobactam.
- Intradermal testing was positive only to the maximum concentration of succinylcholine.

DISCUSSION:

- Determination of causative agents in perioperative anaphylaxis provides information to minimize future exposures, can help to make earlier diagnosis, and can guide subsequent management of medications during anesthesia.
- This case demonstrates the complexity of evaluating perioperative anaphylaxis for a specific causative agent and illustrates that multiple agents can be involved.