12-1-2021

Accidental Ocular Rocuronium Exposure.

Ayal Z Pierce

Sonal Batra

Bailey Norberg

hour.[3] Therefore, the occlusion myocardial infarction group might have been more likely to undergo more frequent serial ECGs than the no-occlusion myocardial infarction group, introducing the risk of a detection bias. Serial ECGs might improve the sensitivity of ECG for occlusion myocardial infarction, so more frequent ECGs in the occlusion myocardial infarction group could have helped identify more occlusion myocardial infarctions in that group.[4,5] On the other hand, less frequent serial ECGs in the less symptomatic no-occlusion myocardial infarction group might have failed to detect dynamic ST deviation and, therefore, lowered the likelihood of modified Sgarbossa criteria or the original Sgarbossa Criteria being false positive for occlusion myocardial infarction. An imbalance in the number of serial ECGs between the occlusion myocardial infarction and no-occlusion myocardial infarction groups might influence the test characteristics of both modified Sgarbossa criteria and original Sgarbossa Criteria by deflating sensitivity and inflating specificity to some degree.

The authors presume that "there is no reason to believe that any of [the study's] limitations disproportionately affected the diagnostic accuracy of either the modified Sgarbossa criteria or the original Sgarbossa Criteria." This is also likely to be true of the possible imbalance in the number of ECGs per subject between the groups. However, a validation study with a defined serial ECG protocol in both the groups or an adjustment for the number of ECGs per subject (as a possible covariate) would be necessary to determine whether serial ECG differentially affects the diagnostic accuracy of modified Sgarbossa criteria and original Sgarbossa Criteria for occlusion myocardial infarction in the setting of ventricular paced rhythm.

Calvin J. Tan, MD
Ian S. deSouza, MD
Department of Emergency Medicine, Downstate/Kings County Hospital, State University of New York
Brooklyn, NY

https://doi.org/10.1016/j.annemergmed.2021.08.018

Funding and support: By *Annals* policy, all authors are Q4 required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (see www.icmje.org). The authors have stated that no such relationships exist.

1. Dodd KW, Zvosec DL, Hart MA, et al. Electrocardiographic diagnosis of acute coronary occlusion myocardial infarction in ventricular paced rhythm using the modified Sgarbossa criteria. *Ann Emerg Med*. 2021;78:517-529.
2. Eriksson D, Khoshnood A, Larsson D, et al. Diagnostic accuracy of history and physical examination for predicting major adverse cardiac events within 30 days in patients with acute chest pain. *J Emerg Med*. 2020;58:1-10.
3. Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol*. 2014;64:e139-e228.
4. Fesmire FM, Percy RF, Bardoner JB, et al. Usefulness of automated serial 12-lead ECG monitoring during the initial emergency department evaluation of patients with chest pain. *Ann Emerg Med*. 1998;31:3-11.
5. Tanguay A, Lebon J, Lau L, et al. Detection of STEMI using prehospital serial 12-lead electrocardiograms. *Prehosp Emerg Care*. 2018;22:419-426.

Accidental Ocular Rocuronium Exposure

To the Editor:

Rocuronium is a commonly used paralytic in rapid sequence intubation in the emergency department (ED).[1,2] Despite familiarity with this critical drug, little is known about the expected course and appropriate management of accidental exposures. We report a case of local symptoms after accidental exposure to rocuronium in the eye.

A healthy 31-year-old woman was working in an urban academic ED. While drawing up 100 mg of rocuronium bromide, the lid on one vial opened (Figure), and she accidentally splashed rocuronium into her left eye. The maximum contamination of the eye would have been 50 mg though the exact amount was unknown. She immediately went to the nearest eyewash station and irrigated her eye for 5 minutes. Afterwards, she presented to Employee Health, who sent her to the ED, where she arrived 30 minutes after exposure.

The patient complained of "heaviness" of her left eyelid and mild blurry vision. She denied any respiratory symptoms, extremity weakness, headache, double vision, eye pain, or sensory deficits. On examination, she had a partial forehead crease flattening with eyebrow raise on her left side. Resistance to eye-opening was slightly weaker on the left eye compared to the right. The patient had a symmetric smile; pupils were equal, round, and reactive to light. She had no lag, weakness, or nystagmus with extraocular eye movements. The remainder of her neurologic examination was unremarkable, as were her cardiac, pulmonary, and abdominal examinations.

The National Capital Poison Control was contacted for guidance, but they had no reports of mucosal exposure of rocuronium. The patient was observed in the ED and, after 2 hours, had complete resolution of her symptoms and

Figure. Vial of rocuronium used in RSI.

facial weakness. The patient never complained of any respiratory symptoms or other systemic abnormalities. She was safely discharged and able to return to work.

With the growing popularity of rocuronium in rapid sequence intubation, accidental exposures should be understood and properly managed. While the exposure of rocuronium to the eye has not been reported, there are case reports of insidious and prolonged neuromuscular blockade with subcutaneous exposure after intravenous infiltration.[3-5] The most life-threatening sign of rocuronium exposure would be respiratory depression requiring intervention. While our patient only exhibited local signs and symptoms that self-resolved within 2 hours, patients with mucosal absorption must be carefully monitored given the potential for systemic paralysis and unknown duration of effects.

Immediate decontamination should be performed, and dosage exposure compared to the patient's weight should be noted. Observation with pulse oximetry, end-tidal monitoring, and sequential negative inspiratory force testing are all relatively simple monitoring strategies that can be used. Should a patient exhibit signs of worsening respiratory depression, such as desaturations, decreasing end-tidal, or worsening negative inspiratory forces, intravenous sugammadex would be the definitive treatment before symptoms become life-threatening. Sugammadex is a readily available reversal agent and has a rapid onset of action. Though rare, hypersensitivity, anaphylaxis, and bradycardia can occur. Therefore, with accidental mucosal exposure of rocuronium, we recommend close monitoring for this self-limiting course as the first line until the effects of the paralysis resolve.

Ayal Z. Pierce, MD

Sonal Batra, MD, MST
Department of Emergency Medicine
George Washington University School of Medicine and Health Sciences
Washington, DC

Bailey Norberg, RN
Department of Emergency Medicine
George Washington University Hospital
Washington, DC

https://doi.org/10.1016/j.annemergmed.2021.09.426

Funding and support: By *Annals* policy, all authors are required to disclose any and all commercial, financial, and other relationships in any way related to the subject of this article as per ICMJE conflict of interest guidelines (seewww.icmje.org). The authors have stated that no such relationships exist.

1. April MD, Arana A, Pallin DJ, et al. Emergency department intubation success with succinylcholine versus rocuronium: A national emergency airway registry study. *Ann Emerg Med*. 2018;72:645-653.
2. Tran DTT, Newton EK, Mount VAH, et al. Rocuronium vs. succinylcholine for rapid sequence intubation: a Cochrane systematic review. *Anaesthesia*. 2017;72:765-777.
3. Timmermann TN, Mongan PD, Hoefnagel, et al. Management of subcutaneous infiltration of rocuronium: A case report. *J Clin Anesth*. 2021;71:110203.
4. Doshu-Kajiura A, Suzuki J, Suzuki T. Prolonged onset and duration of action of rocuronium after accidental subcutaneous injection in a patient with chronic renal failure-a case report. *JA Clin Rep*. 2021;7:18.
5. Navare SR, Garcia Medina O, Prielipp RC, et al. Sugammadex reversal of a large subcutaneous depot of rocuronium in a dialysis patient: a case report. *A&A Pract*. 2019;12:375-377.