

Critical Review Form

Therapy

Experience with Esmolol for the Treatment of Cocaine-Associated Cardiovascular Complications

Am J EM 1991; 9:161-163

Objective: To report one group's experience with esmolol as a treatment for cocaine-associated cardiovascular toxicity.

Methods: The authors report their experience at Grady Memorial Hospital (Atlanta, GA) over 9-months caring for over 300 patients with acute cocaine intoxication. Only 7 patients met their definition of cocaine-related cardiovascular-toxicity which was self-reported cocaine use within the preceding 12-hours or cocaine metabolites in the urine with heart rate > 130, systolic BP > 160 mmHg, or diastolic BP > 120 mmHg.

The 7 patients with cocaine related cardiovascular toxicity received a 0.5mg/kg esmolol bolus followed by 0.05 mg/kg/min titrated to maximum of 0.25mg/kg/min to target a 20% heart rate reduction (or <100) and a 15% systolic/diastolic BP reduction or until an adverse effect was recognized.

Guide		Comments
I.	Are the results valid?	
A.	Did experimental and control groups begin the study with a similar prognosis (answer the questions posed below)?	
1.	Were patients randomized?	No, this is a simple case series.
2.	Was randomization concealed (blinded)?	Not randomized.
3.	Were patients analyzed in the groups to which they were randomized?	One group, analyzed together.
4.	Were patients in the treatment and control groups similar with respect to known prognostic factors?	One group, no assessment of individual prognostic risk factors among the seven reported.

B.	Did experimental and control groups retain a similar prognosis after the study started (answer the questions posed below)?	
1.	Were patients aware of group allocation?	No allocation – all received esmolol.
2.	Were clinicians aware of group allocation?	Yes – all received esmolol.
3.	Were outcome assessors aware of group allocation?	Yes – all received esmolol.
4.	Was follow-up complete?	No loss to follow up is reported.
II.	What are the results (answer the questions posed below)?	
1.	How large was the treatment effect?	<ul style="list-style-type: none"> • Most cocaine exposures were from smoking or IV. • Diaphoresis and palpitations were more common complaints than chest pain, dyspnea, or anxiety. • Esmolol, on average, decreased systolic BP (11%) and heart rate (23%) while being administered for a mean of 83-minutes. • Three patients had “treatment failures” (inadequate symptom/BP/HR response). Two others had possible adverse events (hypotension in one, lethargy requiring RSI in the other), but both of these received ~ 1.4 – 1.9 mg/kg esmolol (compared with 8 – 42 mg/kg in the other patients) for 18` and 28` respectively. <u>Were they simply sympathomimetic depletion syndrome?</u>
2.	How precise was the estimate of the treatment effect?	No estimates of precision were offered on this small sample size.



III.	How can I apply the results to patient care (answer the questions posed below)?	
1.	Were the study patients similar to my patient?	Yes. ED patients presenting after cocaine use.
2.	Were all clinically important outcomes considered?	No. No report on symptom control or outcomes.
3.	Are the likely treatment benefits worth the potential harm and costs?	Uncertain based on this small uncontrolled case series.

Limitations

- 1. Uncontrolled case series useful only for hypothesis generation not for delineation of a cause-effect relationship. Today, authors should follow STROBE guidelines for observational reporting (Ann Int Med 2007; 147 (8): W163-W194 <http://pmid.us/17938396>).**
- 2. No patient or clinician important outcomes are reported.**
- 3. Biological plausibility and dose-response relationship for “treatment failures” is lacking.**

Bottom Line

Small, single-center, limited quality case series of seven cardiac-toxic cocaine patients suggesting that some patients may not demonstrate a reduction in heart rate or BP with esmolol therapy.

