Efficacy and Use of Push-Dose Epinephrine for Peri-intubation Hypotension

Jennifer Harklerode, PharmD[1]; Christine Ciaramella, PharmD, BCCCP[1]; Adebanke Adebayo, MD[2]

[1]The Brooklyn Hospital Center, Department of Pharmacy, Division of Pharmacotherapy, Brooklyn, New York; [2]The Brooklyn Hospital Hospital Center, Department of Emergency Medicine, Brooklyn, New York

BACKGROUND

- Efficacy of push-dose vasopressors is well described in anesthesia literature for management of hypotension in the operating room (OR)[1]
- Increase use of push-dose vasopressors outside of the OR for transient hypotension observed as a result of intubation or procedural sedation or as a bridge to a continuous vasopressor infusion (CVI)[1]
- Efficacy of push-dose phenylephrine for peri-intubation hypotension has been studied in patients presenting to the emergency department (ED) resulting in an increase in mean systolic blood pressure (SBP) and mean diastolic blood pressure (DBP)[2]
- Minimal literature currently exists on the use of push-dose epinephrine (PDE)
- Case report describing use of PDE following witnessed cardiac arrest showed improvement in blood pressure in all patients[3]
- PDE has been studied in transport of critically ill patients showing an increase in mean arterial pressure (MAP), increase in heart rate (HR), and resolution of hypotension reported in 58.5% of patients following a single dose[4]

OBJECTIVE

- Describe the effect of and current practice patterns for the use of PDE for peri-intubation hypotension

METHODS

- Single center, retrospective, Institutional Review Board approved, descriptive evaluation of patients undergoing intubation from October 30, 2019 to January 31, 2020

Inclusion Criteria	Exclusion Criteria
Age ≥ 18 years	Initiated on CVI prior to intubation
Underwent intubation	
Hypotensive (defined as SBP < 90 mmHg)	
Received at least one dose of PDE during the peri-intubation period*	

*Defined as 30 minutes before and after intubation

Primary Outcome

- Change in hemodynamics (i.e. SBP, DBP, HR, MAP) before and after administration of PDE

Secondary Outcomes

- Dose and number of doses of PDE administered
- Initiation of a CVI
- Resolution of hypotension (defined as SBP ≥ 90 mmHg)
- Adverse events (defined as extreme hypertension [SBP ≥ 180 mmHg], extreme tachycardia [HR ≥ 40 bpm], dysrhythmias, or cardiac arrest)

Statistics

- Primary outcome was evaluated using a paired t-test
- Secondary outcomes were evaluated using descriptive statistics [i.e. mean +/- standard deviation, median (range)]
- P-value < 0.05 was considered statistically significant

RESULTS

Table 1: Baseline Characteristics of Patients Who Received PDE (N = 8)

	Frequency (%)
Age (years, mean ± standard deviation)	65 ± 11
Gender	
Female	5 (63)
Male	3 (37)
Reason for Intubation	
Respiratory failure	4 (50)
Unable to protect airway	2 (25)
Respiratory distress	1 (13)
Subarachnoid hemorrhage	1 (13)
Intubating Team	
ED	7 (87)
Critical Care Intensivists	1 (13)
Sedative Used	
Etomidate	7 (87)
Etomidate + Propofol	1 (13)
Paralytic Used	
Rocuronium	6 (75)
None	2 (25)
Fluids Administered	
Yes	6 (75)
No	2 (25)

Data reported as n (%) unless stated otherwise

Table 2: Effect of PDE on SBP, DBP, HR, and MAP (n = 5)

	SBP (mmHg)	DBP (mmHg)	HR (beats/min)	MAP (mmHg)
Pre-PDE	80 (59-101)	49 (40-58)	98 (69-127)	60 (48-72)
Post-PDE	135 (108-162)*	67 (44-90)	96 (31-161)	90 (70-110)

Data reported as mean (95% confidence interval)
*P < 0.05

Figure 1: Patient Population Analysis

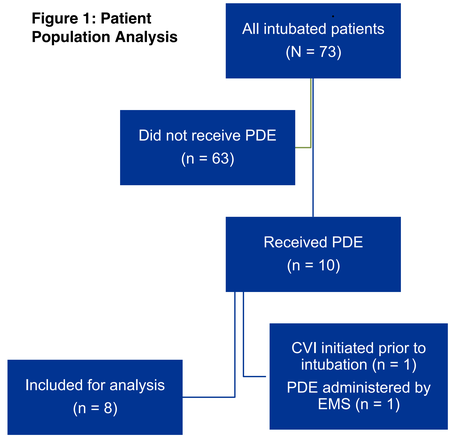

Table 3: Usage of PDE (N = 8)

	Frequency (%)
Received > 1 Dose of PDE	2 (25)
First Dose (mcg, mean ± standard deviation)	16 ± 11
Doses (mean ± standard deviation)	1 ± 1.5
Total Dose (mcg, mean ± standard deviation)	25 ± 19
CVI Initiated	6 (75)
Norepinephrine	6 (75)
Resolution of Hypotension	
Yes	5 (63)
Unable to determine	3 (37)

Data reported as n (%) unless stated otherwise

RESULTS

Table 4: Adverse Events after Receiving PDE (N = 8)

	Frequency (%)
Extreme Hypertension	1 (13)
Extreme Tachycardia	0
Dysrhythmias	0
Cardiac Arrest	0

Data reported as n (%)

DISCUSSION

- Majority of patients were 65-year-old females intubated for respiratory failure by ED providers
- Most common medications used for intubation were etomidate and rocuronium
- Administration of PDE resulted in an increase in SBP, DBP, and MAP for all patients
  - Statistically significant increase in SBP
- Majority (75%) of patients received one 20 mcg dose of PDE
- Majority (75%) of patients were initiated on norepinephrine infusion post-intubation
  - PDE was used as a bridge to CVI
  - PDE used during the peri-intubation period showed temporary stabilization of blood pressure until CVI was initiated
- Majority (63%) of patients had resolution of hypotension after the initial dose(s)
- Limitations include small sample size, retrospective design, and lack of documentation of hemodynamic parameters
- PDE may be useful as a bridge to CVI in practice settings where CVI is not readily available or as a quicker means to stabilization of blood pressure in a critically ill patient

REFERENCES

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Disclosures: The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities: None