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A retrospective evaluation of non-operative use of push dose phenylephrine in critically ill adults

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OBJECTIVE

- To investigate the efficacy, safety and usage patterns of push-dose phenylephrine in non-operative, critically ill patients.

BACKGROUND

- In the last five years, there has been an increase in literature evaluating the use of push-dose vasopressors in hemodynamically unstable patients within emergency departments or critical care areas.[1-3]
- The most common indications include hypotension in the peri-intubation period, during procedural events, and non-procedure related episodes.
- In May 2017, push-dose phenylephrine, packaged as 1000 mcg/10 mL syringes, was approved for use in the emergency department at Parkview Regional Medical Center. In July 2019, this was expanded for use in critical care areas.
- Push-dose phenylephrine has been associated with adverse drug reactions, such as hypertension, bradycardia, and extravasation.[1-4]

METHODS

- Retrospective review of all patients outside of the OR who received at least one push-dose of phenylephrine during an inpatient stay between June 2018- May 2020.
- The impact of phenylephrine on hemodynamic parameters was evaluated by comparing mean arterial pressure (MAP) and heart rate (HR) within 30 minutes pre and post drug administration.
- The effectiveness of phenylephrine was evaluated by evaluating how many patients required additional interventions to increase blood pressure (e.g. intravenous fluid bolus, continuous infusion vasopressor)
- Adverse drug reactions (ADRs) resulting from push-dose phenylephrine and interventions to mitigate these were collected.
- An ADR was defined as systolic blood pressure (SBP) >180 mmHg, diastolic blood pressure (DBP) >100 mmHg, heart rate (HR) < 50 beats per minute (bpm), and/or extravasation that occurred within 30 minutes of the dose.

RESULTS

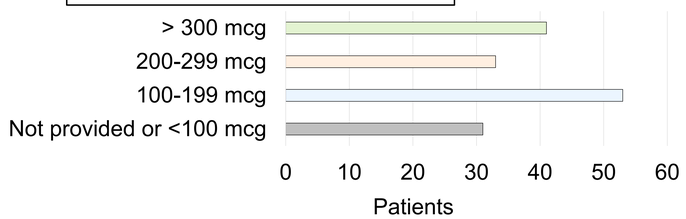
- 143 patients were analyzed and twelve received ≥ 1 dose, resulting in a total of 158 administrations of push-dose phenylephrine

Figure 1: Demographics

Gender (male)	n= 90 (63%)
Indication for administration	
Per-intubation	n= 73 (46%)
Non-procedural	n= 70 (44%)
Other procedural	n= 15 (10%)
Department of administration	
Medical ICU	n= 98 (62%)
Surgical ICU	n= 42 (27%)
Other	n= 18 (11%)

- Median dose of phenylephrine was 200mcg (IQR:100-300)

Figure 2: Phenylephrine doses

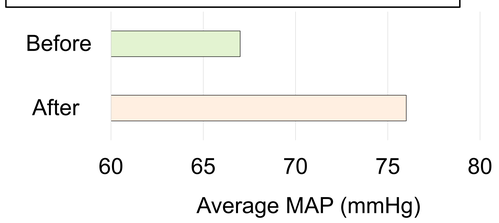


- Additional therapies to increase blood pressure were used within one hour of phenylephrine administration in 74 patients
  - 8 of these patients received >1 additional therapy

Figure 3: Additional interventions

Vasopressor infusion	n= 69 (48%)
IV fluid (dextrose of NS) bolus	n= 9 (6%)
Albumin bolus	n= 4 (3%)

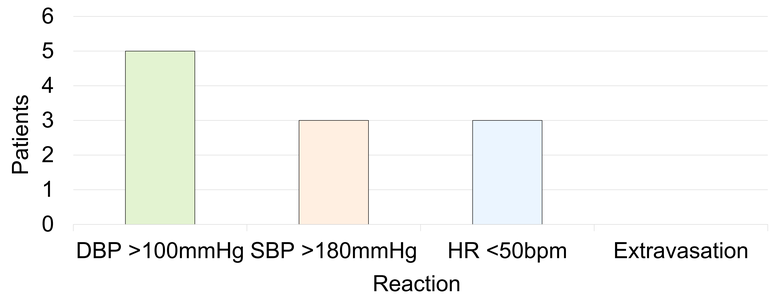
Figure 4: Average MAP after Phenylephrine



RESULTS

- Adverse drug reactions occurred within 30 minutes in 11 (7.7%) patients

Figure 5: Adverse Drug Reactions



- Interventions in patients with bradycardia (HR <50) included atropine (n=2) and isoproterenol (n=1)
- No interventions were administered to patients who developed hypertension

DISCUSSION & CONCLUSIONS

- Phenylephrine was most often utilized in the peri-intubation setting within the medical ICU
- The median dose of phenylephrine administered was 200 mcg
- Push-dose phenylephrine proved to be relatively well-tolerated, and ADRs occurred in 11 patients
- The efficacy of push-dose phenylephrine proved to be transient, and many patients required additional therapies within one hour of the dose to raise blood pressure
- The utilization of push-dose phenylephrine in critical care patients does not negate the need for additional vasopressor support in the majority of patients
- Further research is warranted to assess the duration of action and prevention of invasive interventions

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Disclosure
The authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:
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