Vasopressor Intravenous Push to Enhance Resuscitation (VIPER) Study: Preliminary Results

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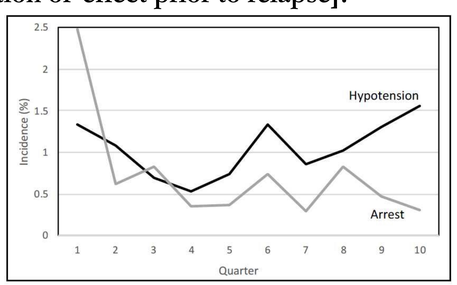
Introduction

- The SBP pattern in patients who arrest due to shock is nonlinear.
- We hypothesized that push-dose pressor (PDP) therapy would benefit patients with critical hypotension and prevent arrest.

Methods

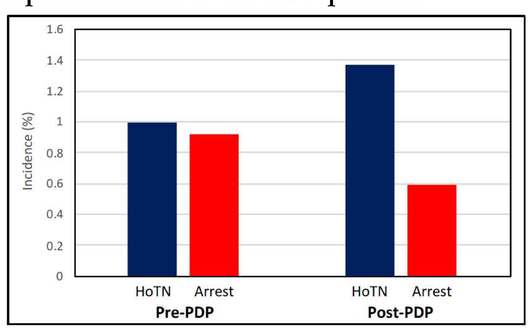
- This was a prospective, observational study enrolling air medical patients with critical hypotension (SBP <90 mmHg) around the time of rapid sequence intubation (RSI).
- Pure vasoconstrictors were selected to avoid adverse cardiac effects [phenylephrine (PE) 200 mcg/dose for non-trauma patients, arginine vasopressin (aVP) 2u/dose for trauma patients.
- Primary outcome measures for this analysis included safety [absence of cardiac dysrhythmia or overshoot hypertension (SBP >160 mmHg) within 20 min] and effectiveness [reversal of hypotension, duration of effect prior to relapse].



The initial drop in peri-RSI arrests was related to better airway management, with subsequent arrests co-variable with hypotension. Concurrent with the PDP protocol, the incidence of peri-RSI arrests dropped away from the existence of hypotension.

Results

- A total of 110 patients were enrolled in the first year.
- Of the non-trauma patients (n=47), PE corrected hypotension in 40 patients (85%); multiple doses of PE were required in 4 patients (27%).
- Of the 37 patients in whom hypotension was corrected, 31 (84%) relapsed within 15 min; only 2 (4%) had overshoot hypertension and there were no dysrhythmias.
- A total of 10 patients (21%) had cardiopulmonary arrest following PE use.
- Of the trauma patients (n=63), aVP corrected hypotension in 57 patients (90%); multiple doses of aVP were required in 12 patients (75%).
- Of the 54 patients in whom hypotension was corrected, 36 (67%) relapsed within 15 min; only 2 (3%) had overshoot hypertension and there were no dysrhythmias.
- A total of 9 patients (14%) had cardiopulmonary arrest following aVP use.
- The overall incidence of peri-RSI arrest declined precipitously following implementation of the PDP protocol.



Reduction in peri-RSI arrests despite no change in incidence of peri-RSI hypotension

Conclusions

- Both PE and aVP appear to be safe and effective for treating critical hypotension in the peri-RSI period.
- Further research is necessary to examine the need to expand the PDP window beyond 15 minutes post RSI, particularly with the low incidence of rebound hypertension.

Key data:

All patients (n=110)

Clinical Outcome	Vasopressin (n=63)	Phenylephrine (n=47)
Responders (HoTN reversed)	57 (90%)	40 (85%)
Early (<15 min)	54 (86%)	37 (79%)
Delayed (>15 min)	3 (5%)	3 (6%)
Rebound hypertension (SBP>160)	2 (3%)	2 (4%)
Cardiopulmonary arrest	9 (14%)	10 (21%)
Airway failure	2 (3%)	0 (0%)
Initial HoTN reversal then relapse (no redosing)	5 (8%)	4 (9%)
Non-responder	2 (3%)	6 (13%)

Patients with initial correction but relapse hypotension (n=67)

Clinical Outcome	Vasopressin (n=36)	Phenylephrine (n=31)
Relapse >15 minutes	20 (56%)	16 (52%)
Relapse <15 minutes	16 (44%)	15 (48%)
Corrected with repeat PDP dose	12 (75%)	4 (27%)
Did not correct with repeat PDP dose	0 (0%)	5 (33%)
Arrest	N/A	
No repeat PDP dose	4 (25%)	6 (40%)

Early responders (n=91)

Clinical Outcomes	Vasopressin (n=54)	Phenylephrine (n=37)
Relapse hypotension	36 (67%)	31 (84%)
Early (<15 min)	16 (30%)	15 (41%)
Late (>15 min)	20 (37%)	16 (6%)
Mean time to relapse	2 (3%)	2 (4%)
Eventual cardiopulmonary arrest	9 (14%)	10 (21%)
Non-responder	2 (3%)	6 (13%)
Airway failure	2 (3%)	0 (0%)
Initial HoTN reversal then relapse (no redosing)	5 (8%)	4 (9%)