6-2019

Development of a methodology to evaluate the frequency of blood pressure assessment in postpartum patients experiencing severe hypertension: A retrospective study

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Background

There is a rising concern as hypertensive conditions increase in pregnant women in the United States. Even more concerning, the Centers for Disease Control report that 6.8% of maternal deaths in the United States from 2011-2015 were attributed to hypertension disorders of pregnancy. Expert opinion treatment protocols have been developed in an effort to reduce mortality from pregnancy related hypertensive disorders.

In 2017 the American College of Obstetricians and Gynecologists (ACOG) recommended a standardized approach for management of severe hypertension which requires close monitoring by clinical staff and a minimum of 16 follow up blood pressure (BP) checks for patients in seven hours. This protocol calls for reassessing blood pressures every 10 minutes for one hour, then, every 15 minutes for one hour, then, every 30 minutes for one hour, then every 60 minutes for four hours.

This study was conducted at the 523-bed Providence St. Vincent Medical Center in the Perinatal Special Care Unit (PSCU), a 15 bed unit that uses the ACOG protocol. There is no existing empirical data to support the current practice.

Purpose

This strict regime based on expert opinion is a burden to patients and staffing resources. A methodology is needed in order to review the evidence to support or change this practice.

Methods

A retrospective chart review was completed on 28 patients who were treated with Labetalol for severe hypertension, systolic blood pressure (SBP) ≥160 or diastolic blood pressure (DBP) ≥105, during the postpartum phase between 09/30/2017 and 12/14/2017.

All postpartum patients within 42 days of delivery requiring treatment for severe hypertension (sHTN), including teenagers and prisoners, were eligible for inclusion. Patients requiring treatment for sHTN only in the antepartum and/or intrapartum phase were excluded.

The study sample was reduced to 16 subjects as 12 subjects did not meet the study inclusion criteria. Of those 16 subjects, five had more than one sHTN episode. These 16 patients experience a total of 23 sHTN episodes.

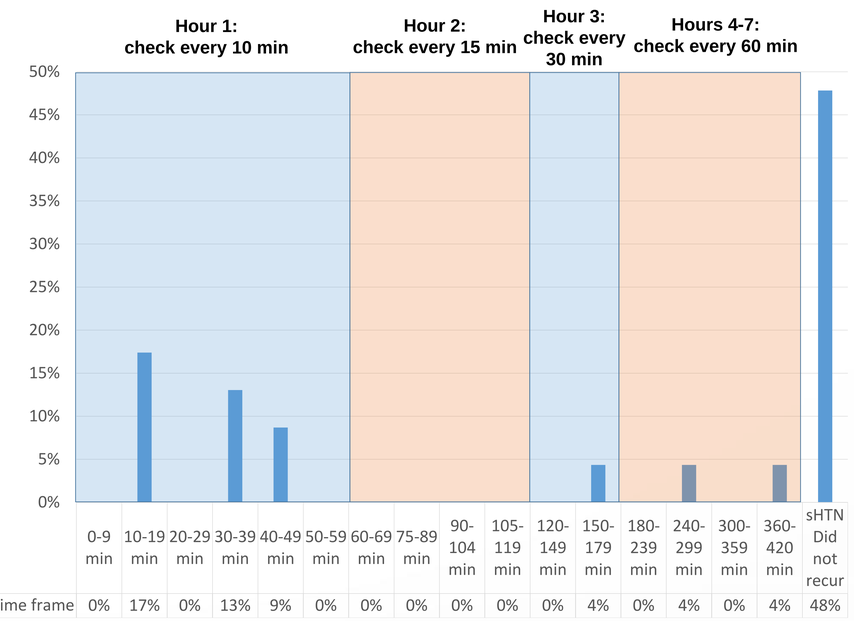
An episode is defined as the time it takes to complete the 7 hours of follow up BP checks without re-intervention due to a sHTN event. If the patient had another sHTN event that required treatment then the 7 hours of follow up BP checks restarts. A sHTN event is any SBP ≥160 or DBP ≥105. Treatment for a sHTN event during an episode will vary by timing within the episode, prior treatment and provider.

This review looked only at the first dose of Labetalol for each episode and the timing of the next subsequent sHTN event following that dose. Labetalol was selected as it is the most common first-line medication used in the PSCU.

Results

Eleven (48%) of the episodes had a sHTN event after the initial Labetalol dose. The timing of recurrence of sHTN event occurred in the first hour in 39% of the 23 episodes. 48% of the 23 episodes did not have a sHTN event following the initial treatment for the duration of the episode. (see figure 1)

Figure 1. Incidence of severe hypertensive (sHTN) event after initial dose on Labetalol



	0-9 min	10-19 min	20-29 min	30-39 min	40-49 min	50-59 min	60-69 min	75-89 min	90-104 min	105-119 min	120-149 min	150-179 min	180-239 min	240-299 min	300-359 min	360-420 min	sHTN Did not recur
% of Episodes with sHTN event at given time frame	0%	17%	0%	13%	9%	0%	0%	0%	0%	0%	0%	4%	0%	4%	0%	4%	48%

Discussion/Conclusions

This pilot demonstrates a straightforward methodology to evaluate recurrence and timing of severe hypertension following treatment. Using this methodology of looking at the timing of follow up severe blood pressure after treatment appears to be reasonable method for further evaluation in a larger study population.

A larger study population would allow for statistical consideration of important variables such as severity of the blood pressures, variety of treatments including but not limited to Labetalol, diagnosis, concurrent medications, co-morbidities, caregiver variation, demographics, cuff size and location, and patient positioning.

Other first-line medications to treat sHTN include Hydralazine and Nifedipine it would be important to study the effects of these medication as well. Study investigators plan to apply this study methodology to a larger population to compose a robust evidence pool to support the current blood pressure reassessment protocol or suggest an alternative.

References

1. Centers for Disease Control and Prevention. (n.d.). Pregnancy Mortality Surveillance System. Retrieved June 6, 2019, from https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pregnancy-mortality-surveillance-system.htm
2. El-Sayed, Y. Y. (2017). Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. The American College of Obstetricians and Gynecologists, 692, 1-6.

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The study sample was reduced to 16 subjects as 12 subjects did not meet the study inclusion criteria. Of those 16 subjects, five had more than one sHTN episode. Total number of sHTN episodes for these16 patients was 23.

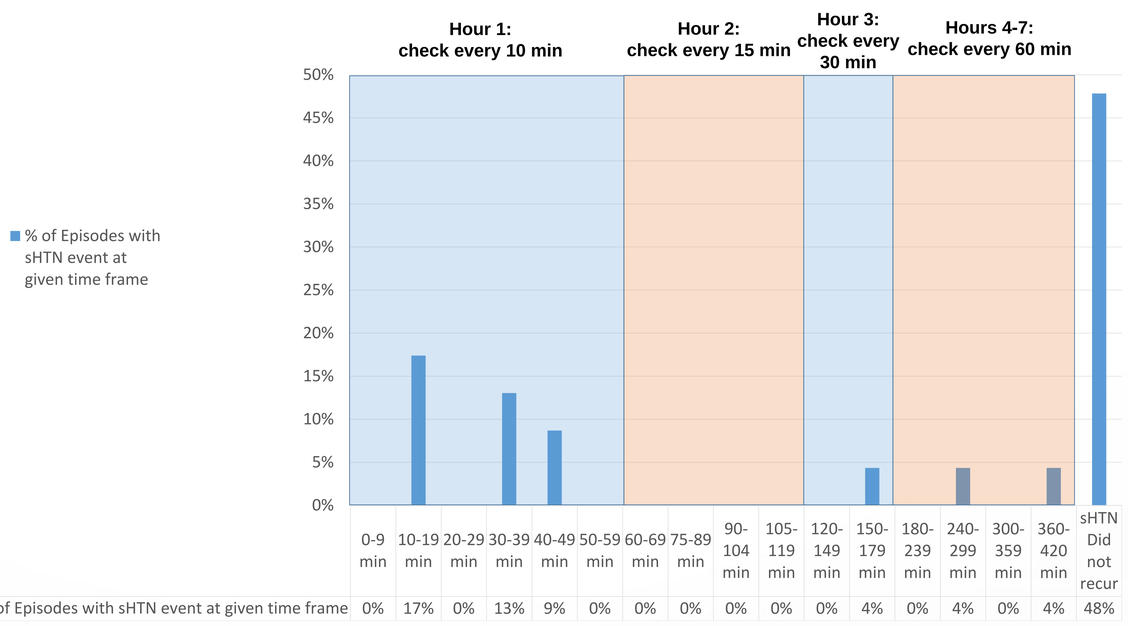
An episode is defined as the time it takes to complete the 7 hours of follow up BP checks without re-intervention due to a sHTN event. If the patient had another sHTN event that required treatment then the 7 hours of follow up BP checks restarts. A sHTN event is any SBP ≥160 or DBP ≥105. Treatment for a sHTN event during an episode will vary by timing within the episode, prior treatment and provider.

This review looked only at the first dose of Labetalol for each episode and the timing of any subsequent sHTN event following that dose. Labetalol was selected as it is the most common first-line medication used in the PSCU. If the patient was re-medicated during the episode, the investigators did not explore this variable.

Results

Eleven (48%) of the episodes had a sHTN event after the initial Labetalol dose. The timing of recurrence of sHTN event occurred in the first hour in 39% of the 23 episodes. 48% of the 23 episodes did not have a sHTN event following the initial treatment for the duration of the episode.

Incidence of severe hypertensive (sHTN) event after initial dose on Labetalol



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