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1026

EVALUATION OF VASOPRESSIN USE IN SEPTIC SHOCK IN THE MEDICAL INTENSIVE CARE UNIT

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INTRODUCTION: Vasopressin (VP) is suggested as adjunctive therapy with norepinephrine (NE) in patients with septic shock to increase mean arterial pressure and decrease vasopressor dosage requirements. However, the optimal timing for initiation or discontinuation of vasopressin based on NE dose remains unclear.

METHODS: This single-center IRB-approved retrospective review included adult patients admitted across two medical ICUs between July 2020 and July 2021. Patients with septic shock who received a continuous infusion vasopressor (NE or phenylephrine) and were initiated on VP for at least 6 hours were included. The primary objective was to characterize the use of VP in this population. Secondary analysis included exploring cost-effective treatment strategies for VP discontinuation. Discontinuation strategies were assessed in patients who survived at least two hours after VP was discontinued. Descriptive statistics were used to characterize the data and Wilcoxon Rank Sum test (Mann Whitney U) was used to compare the median time to discontinuation of NE based on pre-specified NE doses at the time of VP initiation.

RESULTS: A total of 100 patients were included in the primary analysis. VP was initiated at a median NE dose of 14 mcg/min (IQR, 10-20) with 21% of patients having VP initiated at a NE dose of < 10 mcg/min. After starting an initial vasopressor, time to VP initiation was a median of 4.6 hrs (IQR, 2.2-9.2). Time to discontinuation of NE was not different between patients initiated on vasopressin at NE $\leq$ 10 mcg/min or NE $>$ 10 mcg/min (52 vs 56 hrs, p=0.23). Discontinuation strategies were evaluated in 62 patients. The majority of patients (69%) had NE discontinued first and vasopressin continued for a median of 7 hrs. Among 19 patients in whom VP was discontinued first, it was discontinued at a median NE dose of 4 mcg/min. 43 patients on low dose NE ($\leq$ 5mcg/min) were continued on VP for a median 31 hrs. In this case, discontinuation of VP when the NE dose was $\leq$ 5 mcg/min would have resulted in an estimated $609 savings per patient.

CONCLUSIONS: Among patients admitted for septic shock in a medial ICU, VP was initiated at moderately high doses of NE and in a majority of patients VP was discontinued after NE.

1027

THE EFFECT OF A PERIPHERAL NOREPINEPHRINE PROTOCOL ON CENTRAL LINE UTILIZATION IN A SURGICAL ICU

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INTRODUCTION: Central venous catheters (CVC) are associated with various complications. In several studies, the use of vasopressors through peripheral venous catheters (PVC) obviated the need for CVC insertion in 34-87% of patients. Although evidence indicates that the peripheral administration of vasopressors is safe, most health systems currently use protocols that favor the use of CVC over PVC. We proposed a quality improvement study evaluating the use of a protocol for the peripheral administration of a dilute norepinephrine solution (16 mcg/ml) in the surgical intensive care unit (SICU).

METHODS: This was a retrospective quality improvement study conducted at Henry Ford Hospital in Detroit, MI. We included 100 patients that were admitted to the SICU between June and December 2021 and received dilute norepinephrine for any cause through a PVC under our pre-specified protocol. Guidelines for CVC insertion were present in the protocol to assist clinicians. An extravasation protocol was instituted which included application of 2% nitroglycerin ointment. The primary endpoint evaluated was the number of patients in which a CVC was placed, regardless of the cause, within 24 hours of discontinuation of norepinephrine through the PVC. Secondary endpoints included the indication for central line placement, dose of norepinephrine infused, duration of norepinephrine infusions, gauge and location of the PVC, frequency of extravasation events, and tissue injury.

RESULTS: Out of the 100 included in the study 51 patients (51%) did not receive a CVC, and 60 patients (60%) did not receive a CVC within the first 24 hours of discontinuation of peripheral norepinephrine. Norepinephrine extravasation was noted in 6 patients (6%). These incidents were successfully managed with nitroglycerin (2%) ointment.

CONCLUSIONS: We demonstrated that administration of diluted norepinephrine through a PVC following a protocol in the SICU was associated with a reduction in CVC placement. The incidence of extravasation of norepinephrine was rare. Careful assessment of the PVC allowed for early treatment with topical nitroglycerine and no harm was identified to any patient.

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