2023 Pharmacy Research Forum Abstracts

Title: Fibrinolytic and Anticoagulant Trends in Acute Pulmonary Embolism

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Background: Patients with high-risk, acute pulmonary embolism (APE) are typically treated with systemic fibrinolytics (SF) based on current guidelines. Guidelines recommend unfractionated heparin (UFH) as the preferred anticoagulant before fibrinolytics. However, there is lack of consensus on initiation of anticoagulation (AC) after SF. This study aims to provide insight into the optimal timing and dosing of AC after SF therapy in patients with high-risk APE.

Methods: This study was a retrospective review of patients who received SF for treatment of APE during the study period (01/01/2015 - 12/31/2021). The primary outcomes evaluated were mortality and incidence of major bleed defined by ISTH criteria within 7 days. We aimed to determine the relationship between the primary outcomes and several pre-determined predictive variables associated with timing and dose of UFH after SF therapy.

Results: Fifty-one patients were included in the study. Twenty-five patients received UFH after administration of SF. There was no difference in median UFH starting rate (units/kg/hr) among patients who expired vs survived [16.9(IQR 15.5-17.3) vs 16.5(IQR 12.6-17.7);p=1.00] or among patients who had major bleed vs no major bleed [14.1(IQR 10.4-17.1) vs 17.0(IQR 12.7-17.7);p=0.37]. There was no difference in median time(hrs) to start of UFH after SF among patients who expired vs survived [8.8(IQR 3.2-17.4) vs 5.0(IQR 3.7-8.8);p=0.80] or among patients who had major bleed vs no major bleed [6.4(IQR 3.6-9.1) vs 5.0(IQR 3.7-11.0);p=0.92]. Regardless of whether UFH was started when aPTT was <1.5-2x vs ≥2x ULN, there was no difference in mortality (13% vs 22%; p=0.592) or major bleed (13% vs 22%; p=0.592). Median time (hrs) to therapeutic level of UFH was similar among patients who expired vs survived [5.3(IQR 4.9-5.7) vs 6.4(IQR 5.9-15.0);p=0.27] and among those who had major bleed vs no bleed [6.0(IQR 5.9-6.2) vs 6.3(IQR 5.9-15.0);p=0.60].

Conclusions: There was no significant difference in mortality or major bleeding observed with timing of UFH start after SF, starting rate of UFH, aPTT <1.5-2x ULN before starting UFH, or time to therapeutic UFH levels in patients who received SF for APE.

IRB Status: Exempt - Quality Improvement Project

Title: Norepinephrine vs Vasopressin Weaning in Recovery Phase of Shock: Is There a Right Order?

Authors: Alaina Shukdinas, PharmD, Julie Moon, PharmD, BCPS, BCCCP, Harminder Sikand, PharmD, FCSHP, FASHP, FCCP

Background: The Society of Critical Care Medicine (SCCM) recommends the use of vasoactive medications to maintain adequate mean arterial pressure (MAP) in septic shock. Norepinephrine (NE) is recommended as a first-line vasopressor followed by vasopressin (AVP) if MAP goal is not achieved. Although the guidelines are specific on the order of NE and AVP initiation, there is less clarity on weaning order once in recovery phase of shock. Additionally, there is conflicting literature on which vasopressor to wean first. The purpose of this study is to determine if there is an increased risk of hypotension associated with the order of vasopressor weaning.

Methods: In this retrospective study, adult patients ≥ 18 years of age admitted to the ICU receiving concurrent NE and AVP infusions for septic shock at the time of weaning were included. Patients were excluded if they had a diagnosis of mixed shock or were on other parenteral vasoactive therapy at the time of NE or AVP weaning. The primary outcome was incidence of hypotension. Secondary outcomes included were hospital and ICU mortality, vasoactive medication duration, and incidence of acute kidney injury.

Results: A total of 42 patients (NE=27, AVP= 15) were included in this analysis. The groups had similar baseline demographics. There was no statistically significant difference in the incidence of hypotension between the groups (p=0.76). There was no difference in any of the secondary endpoints.

Conclusion: There is no statistically significant difference in the incidence of hypotension in patients who had NE discontinued first compared to those who had AVP discontinued first. There were no differences in any of the secondary outcomes in relation to order of vasopressor weaning. The order of vasopressor discontinuation is not associated with changes in patient outcomes.

IRB Status: IRB Approved

Title: Long-Term Efficacy and Safety of Novel Antiplatelet Therapy Strategy in Veterans Undergoing Elective Percutaneous Coronary Intervention (PCI)

Authors: Alexis Morabe, PharmD, Kayla Giang, PharmD, MS, BCPS, BCCCP, BCCP, Maria K. Stubbs, RPh, BCPS AQ-Cardiology, BCCCP

Background: Aspirin in combination with a P2Y12 receptor antagonist, or dual antiplatelet therapy (DAPT), is the cornerstone of revascularization therapy. Clopidogrel has been robustly studied and utilized as part of DAPT for decades despite a relatively mild potency, slow onset, and variable antiplatelet response among patients. It is currently the only P2Y12 recommended by guidelines for patients with stable ischemic heart disease (SIDH) who are undergoing PCI. Although literature is limited, loading with an antiplatelet with faster onset such as ticagrelor has increased in clinical practice due to favorable pharmacokinetics.

Methods: The retrospective study included patients undergoing elective PCI for SIHD. All patients who had undergone a procedure in the cardiac catheter lab from October 1, 2018 to October 31, 2022 were reviewed. Non-pregnant, adult, DAPT-naïve patients were included. Patients were excluded if they underwent PCI for acute coronary syndrome (ACS) or were not prescribed aspirin. The novel dosing evaluated was ticagrelor 180 mg followed by 90 mg post-PCI then switched to clopidogrel 300 mg on post-procedure day 1 and continued on 75 mg daily. The standard group consisted of either clopidogrel 600 mg then 75mg daily or ticagrelor 180 mg then 90 mg twice daily.

Results: Of 728 patients evaluated for this study, a total of 54 met criteria (standard, n=25 and novel, n=29). There were no statistically significant differences in baseline characteristics such as age, comorbidities, or chronic medications. There were also no differences in MACE, bleeding events, or secondary outcomes at 24h, 7d, 14d, 30d, and 180d.

Conclusion: This study evaluated the efficacy and safety of this practice in the veteran population. Limitations include sample size and larger, randomized controlled trials should be conducted in the future. In patients undergoing elective PCI for SIHD, it is reasonable to switch from ticagrelor to clopidogrel for desirable pharmacokinetics given no difference in efficacy or safety.

IRB Status: Approved

Title: Comparison Of Icu Sedation Practices Pre-Covid And During Covid In Non-Covid Patients

Author(s): Janelle Agustin, PharmD

Introduction: The SCCM ICU Liberation Bundle is an evidence-based critical care initiative to improve and optimize ICU patient outcomes, including light sedation goals. Pharmacologic interventions in this bundle include pain, sedation, and delirium. However during the COVID-19 pandemic, study surveys have shown that mechanically ventilated COVID-19 patients had deeper sedation practices which may have affected sedation care in non-COVID-19 patients. The goal of this study is to compare sedation practices in pre- and during the COVID-19 pandemic in non-COVID-19 patients. The results of this study will determine if there was a difference of sedation practices between the two timeframes and if a difference is identified, this may lead to process improvement initiatives.

Methods: This is a retrospective chart review of adult patients admitted to the ICU for at least 24 hours who are mechanically ventilated in February 2020 and August 2021 at three hospitals. Exclusion criteria are patients with a positive COVID-19 diagnosis, therapeutic hypothermia, status epilepticus, patients who are paralyzed, proned patients, undergoing palliative care or withdrawal of life, and on extracorporeal membrane oxygenation (ECMO). Medical charts will be reviewed for relevant demographic, clinical, and laboratory data. The primary outcome is the level of sedation used in non-COVID-19 positive patients before and during the COVID-19 pandemic. Secondary endpoints include hospital length of stay, ICU length of stay, ventilator days, in-hospital mortality, pain scores, CAM-ICU results, and relevant medications.

Results: In the months of February 2020 and August 2022, 625 patients were screened for eligibility and 344 patients were enrolled. Delirium was statistically significant in the COVID pandemic timeframe ($p<0.0001$). No differences were seen in baseline characteristics, patient outcomes, remaining ICU bundle, and sedative and pain medications. The duration of propofol was similar while duration of dexmedetomidine was longer by one day in the pre COVID arm (2.60 days vs 1.67 days).

Conclusion: In non-COVID ICU patients before and during the COVID pandemic, no differences in ICU sedation practices and patient outcomes were identified with exception of delirium.

IRB Status: IRB Exempt – Quality Improvement Project

Title: Comparison of Epinephrine Versus Norepinephrine on Post Cardiac Arrest Outcomes

Authors: Jacqueline Mae Paz, PharmD, Nam Cho, PharmD, Scott Fitter, PharmD, BCCCP

Background: Post-resuscitation shock may occur in 50 – 70% of patients who experience cardiac arrest, leading to multiple-organ failure and increased mortality.[1] The American Heart Association highlights the importance of hemodynamic support after achieving return of spontaneous circulation (ROSC) but does not provide specific vasopressor recommendations.[2] A recent study by Bougoin, et al. found that epinephrine (EPI) infusion for post-resuscitation shock was associated with higher all-cause and cardiovascular-specific mortality, compared with norepinephrine (NE) infusion.[3] The purpose of this study is to compare the use of EPI versus NE infusions in patients who had outside hospital cardiac arrest (OHCA) in terms of clinical outcomes, length of stay, and need for additional vasopressor support.

Methods: This Institutional Review Board approved, retrospective, single center study evaluated adult patients with OHCA who received EPI or NE as a continuous infusion for at least six hours. Patients were excluded for cardiac arrest secondary to noncardiac causes, refractory shock requiring extracorporeal membrane oxygenation, treatment with concurrent EPI and NE infusions, documented pregnancy and prisoners.

Results: One hundred four patients were included in the study, including 62 patients in the NE group and 42 patients in the EPI group. Baseline characteristics were mostly well-matched, except for a higher prevalence of congestive heart failure in the EPI group (13% vs. 17%, p-value=0.031). There was no statistical significance for survival to discharge (41% vs. 36%, p-value=0.258), recurrent cardiac arrest (21% vs. 12%, p-value=0.569), hospital length of stay (LOS) (8 days vs. 11 days, p-value=0.263) and intensive care unit LOS (8 days vs. 8 days, p-value=0.912). There was no statistically significant difference between duration and max infusion rate of vasopressors. The NE group required less additional vasopressors (52% versus 10%, p-value=<0.001).

Conclusion: For OHCA, the use of EPI versus NE did not result a statistically significant difference in survival to hospital discharge. However, patients in the NE group needed less additional vasopressor support than the EPI group. While additional studies are needed to confirm these findings, there may be benefit to utilizing NE instead of EPI for OHCA with post-resuscitation shock.

IRB Status: IRB Approved