Abbreviations:
PL = Plenary; LO = Lightning oral; MP = Moderated poster; P = Poster

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Plenary Oral Presentations

PL01

Creation of a risk scoring system for emergency department patients with acute heart failure

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Introduction: Acute heart failure (AHF) is a common emergency department (ED) presentation and may be associated with poor outcomes. Conversely, many patients rapidly improve with ED treatment and may not need hospital admission. Because there is little evidence to guide disposition decisions by ED and admitting physicians, we sought to create a risk score for predicting short-term serious outcomes (SSO) in patients with AHF. **Methods:** We conducted prospective cohort studies at 9 tertiary care hospital EDs from 2007 to 2019, and enrolled adult patients who required treatment for AHF. Each patient was assessed for standardized real-time clinical and laboratory variables, as well as for SSO (defined as death within 30 days or intubation, non-invasive ventilation (NIV), myocardial infarction, coronary bypass surgery, or new hemodialysis after admission). The fully pre-specified, logistic regression model with 13 predictors (age, pCO2, and SaO2 were modeled using spline functions with 3 knots and heart rate and creatinine with 5 knots) was fitted to the 10 multiple imputation datasets. Harrell's fast step-down procedure reduced the number of variables. We calculated the potential impact on sensitivity (95% CI) for SSO and hospital admissions and estimated a sample size of 170 SSOs. **Results:** The 2,246 patients had mean age 77.4 years, male sex 54.5%, EMS arrival 41.1%, IV NTG 3.1%, ED NIV 5.2%, admission on initial visit 48.6%. Overall there were 174 (7.8%) SSOs including 70 deaths (3.1%). The final risk scale is comprised of five variables (points) and had c-statistic of 0.76 (95% CI: 0.73-0.80): 1.Valvular heart disease (1) 2.ED non-invasive ventilation (2) 3.Creatinine 150-300 (1) ≥300 (2) 4.Troponin 2x-4x URL (1) ≥5x URL (2) 5.Walk test failed (2) The probability of SSO ranged from 2.0% for a total score of 0 to 90.2% for a score of 10, showing good calibration. The model was stable over 1,000 bootstrap samples. Choosing a risk model total point admission threshold of >2 would yield a sensitivity of 80.5% (95% CI 73.9-86.1) for SSO with no change in admissions from current practice (48.6% vs 48.7%). **Conclusion:** Using a large prospectively collected dataset, we created a concise and sensitive risk scale to assist with admission decisions for patients with AHF in the ED. Implementation of this risk scoring scale should lead to safer and more efficient disposition decisions, with more high-risk patients being admitted and more low-risk patients being discharged.
Keywords: heart failure, risk scale, safety

PL02

Double Sequential External Defibrillation for Refractory Ventricular Fibrillation: the DOSE VF pilot randomized controlled trial

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Introduction: Despite recent advances in resuscitation, some patients remain in ventricular fibrillation (VF) after multiple defibrillation attempts during out-of-hospital cardiac arrest (OHCA). Vector change defibrillation (VC) and double sequential external defibrillation (DSED) have been proposed as alternate therapeutic strategies for OHCA patients with refractory VF. The primary objective was to determine the feasibility, safety and sample size required for a future cluster randomized controlled trial (RCT) with crossover comparing VC or DSED to standard defibrillation for patients experiencing refractory VF. Secondary objectives were to evaluate the intervention effect on VF termination and return of spontaneous circulation (ROSC). **Methods:** We conducted a pilot cluster RCT with crossover in four Canadian paramedic services and included all treated adult OHCA patients who presented in VF and received a minimum of three defibrillation attempts. In addition to standard cardiac arrest care, each EMS service was randomly assigned to provide continued standard defibrillation (control), VC or DSED. Services crossed over to an alternate defibrillation strategy after six months. Prior to the launch of the trial, 2,500 paramedics received in-person training for VC and DSED defibrillation using a combination of didactic, video and simulated scenarios. **Results:** Between March 2018 and September 2019, 152 patients were enrolled. Monthly enrollment varied from 1.4 to 6.1 cases per service. With respect to feasibility, 89.5% of cases received the defibrillation strategy they were randomly allocated to, and 93.1% of cases received a VC or DSED shock prior to the sixth defibrillation attempt. There were no reported cases of defibrillator malfunction, skin burns, difficulty with pad placement or concerns expressed by paramedics, patients, families, or ED staff about the trial. In the standard defibrillation group, 66.6% of cases resulted in VF termination, compared to 82.0% in VC and 76.3% of cases in the DSED group. ROSC was achieved in 25.0%, 39.3% and 40.0% of standard, VC and DSED groups, respectively. **Conclusion:** Findings from our pilot RCT suggest the DOSE VF protocol is feasible and safe. VF termination and ROSC were higher with VC and DSED compared to standard defibrillation. The results of this pilot trial will allow us to inform a multicenter cluster RCT with crossover to determine if alternate defibrillation strategies for refractory VF may impact patient-centered, clinical outcomes
Keywords: double sequential external defibrillation, refractory ventricular fibrillation, vector change defibrillation

PL03

Thromboembolic events following cardioversion for acute atrial fibrillation and flutter: a systematic review and meta-analysis

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Introduction: Several recent observational studies have presented concerning data regarding the safety of cardioversion (CV) for acute

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