A descriptive analysis of prehospital refractory ventricular fibrillation

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Introduction

• When repeated defibrillations fail to terminate ventricular fibrillation (VF), it is classified as refractory ventricular fibrillation (RVF)
• Aside from standard ACLS, there is little evidence on appropriate novel treatments for RVF
• There is also little data on prehospital factors associated with RVF
• Double sequential external defibrillation (DSED) has been proposed as a potential viable treatment strategy

Objectives

• Provide a descriptive analysis of patients in an urban EMS system with RVF
• Describe the frequency that DSED may have been utilized in this patient population

Methods

• A retrospective chart review of Ambulance Call Records (ACRs) for out-of-hospital cardiac arrest was performed for the period of Mar. 1, 2012 - Apr. 1, 2016
• RVF defined as ≥ 5 defibrillations
• Patient factors of interest included age and gender
• Clinical factors collected included time from EMS activation to arrival at patient/time to first shock, and bystander CPR
• Descriptive characteristics and clinical factors compared between RVF and non-RVF using Chi-square and t-test where appropriate

Results

• Between Mar. 1, 2012 and Apr. 1, 2016 there were 645 out-of-hospital cardiac arrest calls
• 193 (29.9%) of these involved at least one analysis of VF, and 90 (13.9%) of total cases were identified as RVF
• 34 (37.8%) of RVF cases had two or more defibrillators on scene
• There was no difference between the RVF and non-RVF groups with respect to age (65.02 vs 67.28, p=0.313) or gender (p=0.132)
• There were no differences between the RVF and non-RVF groups with respect to any prehospital factors, including time from activation to arrival at patient (9.00 min vs 8.73 min, p=0.610), time to first shock (11.31 min vs 12.63 min, p=0.122)
• There was no difference between groups for incidence of bystander CPR (p=0.840)

Conclusions

• In this study population, nearly half of all out-of-hospital cardiac arrests involving VF were refractory
• Almost 40% of these cases had the potential for DSED to be utilized as a treatment strategy
• There were no measured prehospital patient factors or provider factors that were associated with RVF in this study
• Further efforts need to be made to identify those at risk for RVF as well as potential beneficial treatment strategies