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Early Identification of Patients With Out-of-Hospital Cardiac Arrest with No Chance of Survival and Consideration for Organ Donation, Annals of Internal Medicine, September 2016

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BLUF: Patients with OHCA receiving advanced life support from paramedics or physicians suggests that there is essentially no chance of survival in patient whose Out of Hospital Cardiac Arrest (OHCA) is not witnessed by EMS personnel, who have a non-shockable initial cardiac rhythm, and in whom ROSC does not occur before receipt of a third 1 mg dose of epi. This may help in decision making regarding organ uncontrolled donation after cardiac death.

Clinical Question: Are there any criteria to allow for early identification of patients with out of hospital cardiac arrest (OHCA) with essentially no chance of survival in regards to decision making about organ donation?

Background: Despite improvements in resuscitation techniques used by prehospital EMS and in-hospital intensivists, most patients with OHCA do not survive. Mortality remains as high as 92-94%. Authors of large series on termination-of-resuscitation rules agree that a survival rate of 1% in patients with OHCA reflect medical futility and that stopping CPR is reasonable. They do not however take into consideration potential utility of transporting dead patients to the hospital for organ donation. 2015 AHA guidelines recommend patients who do not have ROSC after resuscitation and who would otherwise have termination of efforts may be considered for candidates for organ donation. Delays in recognizing futile resuscitation efforts result in lost opportunities for donation of potential viable organs. This study sought to identify patients with OHCA and no chance for survival during the first minutes of advanced CPR.

Methods: This was a retrospective assessment using OHCA data from 2 EMS registries in France and 1 published clinical trial in the US (France SDEC prospective cohort, PRESENCE multicenter cluster randomized trial, US King County Washington prospective cohort) all of which performed CPR according to international guidelines. Three criteria strongly associated in the literature with lack of survival were selected. 1) OHCA not witnessed by EMS/first responders, 2) non-shockable initial cardiac rhythm according to whether a shock was given at arrival, 3) no sustainable ROSC before receipt of third 1 mg dose of epi. These three criteria were evaluated in 1,771 patients with OHCA from the first year of the SDEC registry (16 May 2011-15 May 2012) and prospectively validated internally for the next 2 years of registry data. Then they were externally validated with the PRESENCE and King County cohorts (5192 patients). End point was the survival rate at hospital discharge. Secondary end point was the number of patients eligible for organ donation according to French protocol for kidney retrieval from UDCD in the SDEC cohorts.

Results: In the Paris SDEC 1 year cohort, the survival rate among the 772 patients with OHCA who met the objective criteria was 0% (95% CI, 0.0% to 0.5%) with a specificity of 100% (CI, 97-100%), and a positive predictive value of 100% (CI, 99%-100%). The criteria were internally validated over the following 2 years of data from the SDEC study. 3,898 patients from the Paris SDEC patients had OHCA. When the objective criteria were met, 1 patient survived to hospital discharge in a persistent vegetative

state. In the Presence Cohort, 486 patients had OHCA. No patients who met objective criteria survived to day 28. In the King county cohort 2,669 patients had OHCA, no patient who met objective criteria survived. Based on the French protocol for kidney retrieval, 95 patients (12%) may have been eligible for organ donation).

Conclusion/Discussion:

This study is limited by the fact that it is a retrospective assessment. However the authors go through great lengths to internally and externally validate their data. It definitely holds face validity but will require a prospective study. Additionally, study was supported by the French Ministry of Health. In France, there is a current requirement of 30 minutes of ACLS before on-site patient extrication. It is important to mention that one of the authors received personal fees from AbbVie, Alere, BioPorto and Fresenius. AbbVie manufactures many drugs including immunosuppressants. Alere makes screening lab tests to include those for organ donation. Fresenius is involved with ESRD and organ donation. A limitation mentioned in the study was the fact that 135 of the initial 1,906 had missing data (objective, outcome or both). 126 of those were only missing the objective criteria however, all of these patients died. 8 of them were missing outcome data but all had criteria for continuing ACLS. Only 1 subject was missing both. If this patient met the objective criteria and survived 0.001% would have been discharged alive. In Presence, 16% of them were discharged alive at 1 month, in Paris 8-9% were discharged alive at 1 month and in King County 23 were discharged alive at 1 month. Additionally, the King County population was younger (18-54) due requirements for uncontrolled OHCA donations in Western countries. This suggests that the criteria have good generalizability. This will change my practice in that I will likely not be spending as much time on a code that meets all 3 of these criteria.
