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Survival Analysis Based on the Duration of CPR After In-Hospital Cardiac Arrest


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PURPOSE: The duration of cardiopulmonary resuscitation (CPR) significantly affects long-term survival in patients with in-hospital cardiac arrest (IHCA). No clear guidelines are available to guide the optimal discontinuation of CPR. In this study, we questioned the long-term clinical benefits of extending CPR beyond twenty minutes for patients with in-hospital cardiac arrest.

METHODS: This study was a retrospective chart review of 169 patients with IHCA recorded between January 1st, 2016, and December 31st, 2018, at a large volume tertiary care community hospital.

RESULTS: 169 patients included in this study suffered cardiac arrest during hospitalization. The mean age for the patients was 70 years (SD = 16.35). 52.6% of subjects were male, and 47.4% were females. Overall, ROSC was achieved in 65% of patients, and the average cumulative survival was 26.6%. Initial rhythm was shockable in 23.1% of cardiac arrest patients. Initial shockable rhythm was associated with improved survival compared to a non-shockable rhythm (41% vs. 22.5%, $p = 0.022$) 38.4% of patients were resuscitated for more than 20 minutes. Our data indicate that the achievement of ROSC and subsequent survival to discharge was significantly impacted by the duration of cardiac arrest. In patients who had cardiac arrest for less than 20 minutes, 60.9% of patients achieved ROSC, compared to 37.9% who arrested for more than 20 minutes. Survival to hospital discharge was significantly lower for patients who had cardiac arrest for more than 20 minutes, compared to patients who arrested for less than 20 minutes (3.1% vs. 41.3%, $p = <0.0001$). For patients who had a cardiac arrest for more than 30 minutes, ROSC was achieved in only 14.8% of patients. None of these patients survived to be discharged from the hospital ($p = <0.0001$). In our study, older age was not related to a shorter duration of CPR (Pearson correlation: 0.030, $P = 0.69$). Subgroup analysis showed that overall survival was 21.4% in patients greater than 70 years, but none survived when the duration of CRP exceeded twenty minutes.

CONCLUSIONS: From our data, it appears that survival is lower when CPR is unsuccessful in achieving ROSC at twenty minutes, and there is no survival benefit of extending CRP for more than 30 minutes. Older patients receiving longer CPR appear to have worse clinical outcomes.

CLINICAL IMPLICATIONS: The optimal duration of CPR remains an unclear area, but in a relatively old and selected population, extending CPR beyond twenty minutes may be clinically futile. Large studies with subgroup analysis directed at the duration of CPR and its effect on survival may be needed to further guide in this regard.