Survival disparities for in-hospital cardiac arrests occurring during nights and weekends

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Background: In-hospital cardiac arrest is a life-threatening event, often leading to poor outcomes and high mortality rates. There is limited research investigating how the time and day of arrest might impact long-term outcomes, such as mortality and functional status.

Purpose: To investigate the relationship between time and day of arrest and long-term outcomes in patients who experience in-hospital cardiac arrest.

Methods: This study included all patients who experienced an in-hospital cardiac arrest between January 1st, 2013 and December 31st, 2019, and who had a clinical indication for resuscitation. Data was obtained from the Danish in-hospital cardiac arrest registry, which was linked to other national registries to gather information on patient characteristics, such as survival, anoxic brain damage, and nursing home admission.

The patients were stratified into three groups (A-C) based on time and day of the week: Group A included patients who were resuscitated during regular working hours (Monday to Friday from 08:00 to 15:59), Group B included patients who were resuscitated during off-hours (Monday to Sunday from 16:00 to 23:59 and Saturday to Sunday from 08:00 to 15:59), and Group C included patients who were resuscitated during off-hours at night (Monday to Sunday from 00:00 to 07:59).

Standardized average probability of outcomes was estimated using logistic regression.

Results: The study population consisted of 9,225 patients, median age was 74 (1st-3rd quartile [Q1-Q3] 65-81 years) and 63.3% were men. In total, 53.6% (n = 4,909) of the patients achieved return of spontaneous circulation (ROSC). The standardized absolute chance of 30-day survival was 32.7% (95% CI 30.9%-34.5%) for group A, 27.2% (95% CI 25.7%-28.7%) for group B, and 23.6% (95% CI 22.0%-25.3%) for group C. Similarly, the chance of 1-year survival was highest for group A (27.6%; 95% CI 25.9%-29.3%) gradually decreasing to 18.9% (95% CI 17.4%-20.4%) in group C (Fig. 1).

For patients who survived at least 30 days following an in-hospital cardiac arrest, the standardized absolute chance of surviving without anoxic brain damage or admission to a nursing home within one year was greatest among those in group A (81.1%; 95% CI 78.3%-83.8%), but decreased to 75.1% (95% CI 72.2%-78.1%) for those in group B, and 72.2% (95% CI 68.3%-76.1%) for those in group C (Fig. 1D).

Conclusion: In conclusion, this study found that patients who experience in-hospital cardiac arrest during off-hours at night have significantly lower chances of survival at both 30 days and 1 year compared to those experiencing an arrest during on-hours or off-hours. Additionally, among patients who survive the initial 30 days, those resuscitated during off-hours at night have the poorest outcomes, with lower chances of 1-year survival without anoxic brain damage or nursing home admission.