

Delayed Call Receipt-to-Epinephrine Administration Prolongs Epinephrine-to-ROSC Interval in Out-of-Hospital Cardiac Arrest



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Introduction

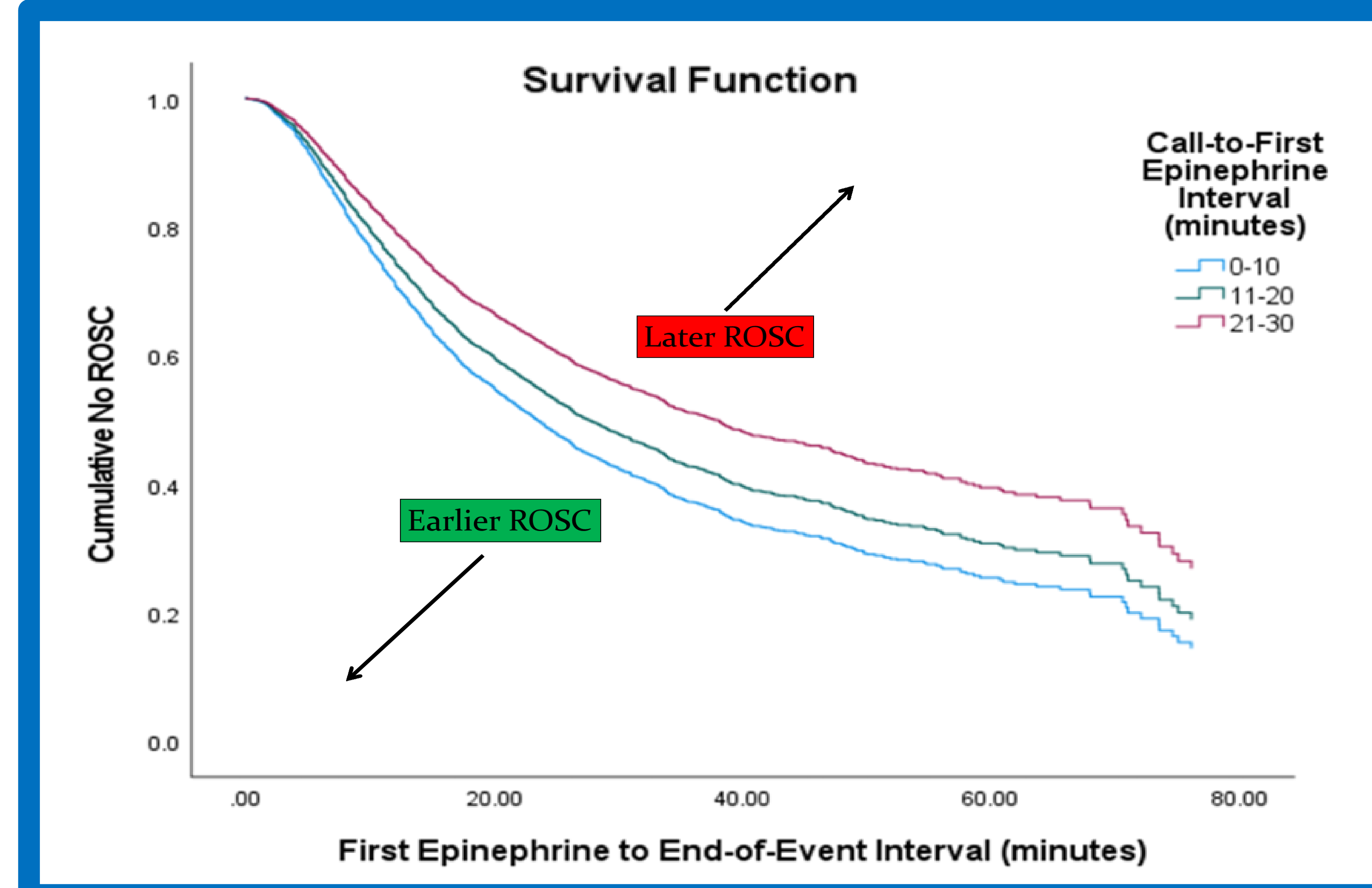
- Previous investigations have demonstrated that longer durations of resuscitative efforts are associated with poorer patient outcomes.
- Early epinephrine administration is associated with attainment of ROSC, but the relationship between the time to administration and the time to ROSC has not been evaluated.

Study Objective

- We sought to quantify the relationship between the call receipt-to-epinephrine (CtE) interval with the epinephrine-to-ROSC (EtR) interval.

Methods

- We conducted a retrospective analysis using the 2020 ESO Data Collaborative dataset.
- Adult patients who experienced witnessed, non-traumatic OHCA prior to EMS arrival and received epinephrine were included.
- The primary outcome measure was the relationship between call receipt-to-epinephrine interval (grouped into 0-10, 11-20, and 21-30 minute intervals) and epinephrine-to-ROSC interval.
- Adjusted hazard ratios (HR) were derived via a Cox proportional hazard model to control for confounding variables.
- Confounding variables were selected a priori and included patient age, sex, and non-Caucasian race; etiology of arrest; shockable presenting rhythm; layperson CPR; AED shock prior to EMS arrival; and placement of an advanced airway of any type.



Variable	Hazard Ratio	95% CI	p-value
Age (per year)	1.000	0.997-1.002	0.780
Male sex	0.77	0.716-0.828	<0.001
Minority	0.896	0.826-0.973	0.009
Etiology of Arrest			
Presumed Cardiac	(reference)		
Respiratory	1.282	1.156-1.422	<0.001
Drug overdose	1.522	1.207-1.919	<0.001
Other	1.043	0.852-1.276	0.686
Received layperson CPR	1.081	1.002-1.167	0.045
Initial shockable rhythm	1.243	1.147-1.346	<0.001
Received AED shock prior to EMS arrival	1.020	0.876-1.187	0.798
Received advanced airway placement	0.955	0.858-1.063	0.398
Call Received-to-First Epinephrine			
0-10 minutes	(reference)		
11-20 minutes	0.861	0.776-0.954	0.004
21-30 minutes	0.680	0.597-0.773	<0.001

Results

- A total of 6,725 patients met the inclusionary criteria and had complete data for analysis:
 - 65.01(±15.8 SD) mean years of age
 - 16.14 (±4.9 SD) mean CtE interval
 - 14.02 (±10.3 SD) mean EtR interval
 - 63.3% males
 - 82.5 % presumed cardiac etiology
 - 28.2 % initial shockable rhythm
 - 30.5 % bystander CPR
 - 47.6 % experienced ROSC
- Compared to 0-10 minute CtE interval, ROSC was less likely when epinephrine was administered 11-20 minutes (HR=0.861, p=0.004) and 21-30 minutes (HR=0.680, p<0.001) after call receipt.
- When CtE was modeled as a continuous variable, the risk of ROSC declined by 3% per minute (HR=0.971, p<0.001).

Conclusion

- This retrospective analysis from a national database revealed that increasing delays in first epinephrine administration were associated with prolonged resuscitation duration post-drug administration and decreased likelihood of ROSC.

Limitations

- Retrospective design that was reliant upon accuracy of patient records.
- No data on CPR quality.
- No data on longer-term outcomes.