주최·주관 대한심장혈관흉부외과학회

2024 대한심장혈관흉부외과학회

제56차 추계학술대회

2024. 10. 31 (Thu) - 11. 01 (Fri) 여수 엑스포 컨벤션센터

Impact of Extracorporeal Life Support for a Refractory Out-of-Hospital Cardiac Arrest: Result from National Sudden Cardiac Arrest Survey

Purpose

- In a recent multicenter trial, patients with an out-of-hospital cardiac arrest (OHCA) were randomly assigned to receive extracorporeal CPR or conventional CPR. The study showed the similar survival with a favorable neurologic outcome in both groups. (Engl J Med 2023;388:299-309.)
- Although the study is valuable in well-designed and timely manner, the role of extracorporeal CPR was not clearly addressed in their intention-to-treat analysis as the ECMO was established only for the 66% of extracorporeal group.
- Therefore, **we aimed to evaluate the impact of extracorporeal CPR in the bystander-observed OHCA patients on the survival and neurologic outcomes using a Korean nationwide database.**

Methods

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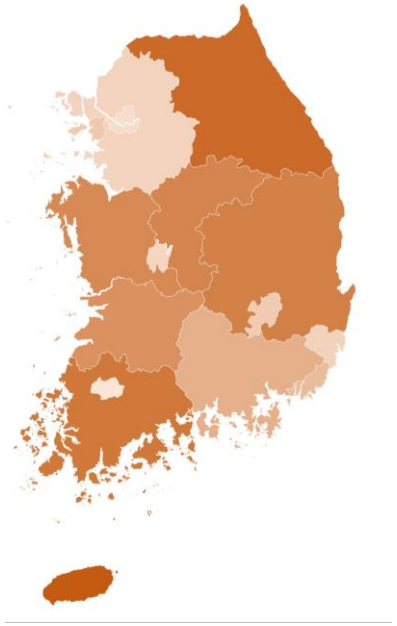
- Outbreaks in Korea

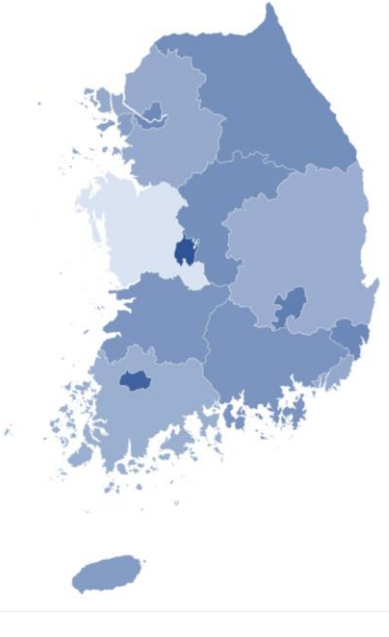


지역	N / 10-millions
서울특별시	3614.729
부산광역시	4588.471
대구광역시	4130.279
인천광역시	4220.81
광주광역시	3382.851
대전광역시	3822.255
울산광역시	3908.099
경기도	3885.993
강원도	7013.404
충청북도	6239.821
충청남도	6099.948
전라북도	5855.075
전라남도	6631.113
경상북도	6370.971
경상남도	4955.856
제주도	7521.743

- Admissions

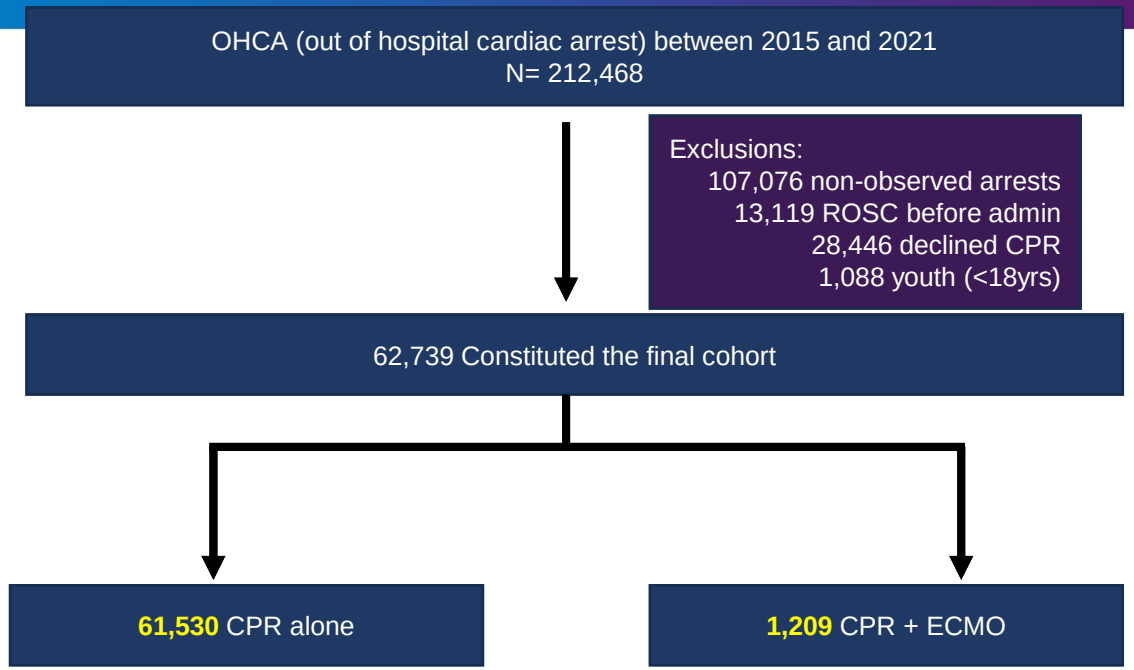
지역	N / 10-millions
서울특별시	3736.562
부산광역시	4474.594
대구광역시	4372.594
인천광역시	4201.573
광주광역시	3762.878
대전광역시	4361.541
울산광역시	4057.182
경기도	3777.223
강원도	7198.327
충청북도	6390.875
충청남도	5242.411
전라북도	5930.561
전라남도	7692.458
경상북도	6139.428
경상남도	5032.105
제주도	7521.743

- Admission/Outbreak Ratio



지역	Ratios
서울특별시	1.033704674
부산광역시	0.975182069
대구광역시	1.058667843
인천광역시	0.995442359
광주광역시	1.112339274
대전광역시	1.141091052
울산광역시	1.038147139
경기도	0.972009736
강원도	1.026367087
충청북도	1.024207943
충청남도	0.859418932
전라북도	1.012892493
전라남도	0.96281362
경상북도	0.963656604
경상남도	1.015385645
제주도	1

Methods



- **Interested study outcomes**
  - Primary outcome: Mortality
    - Immediate: before 2nd hospital day
    - Early: before 31st hospital day or discharge
    - Overall: Cox-regression analysis
  - Secondary outcome: Neurologic outcome (>CPC 2)
    - Competing risk analysis for death events
- **Baseline adjustment with propensity-score model**
  - Baseline variables, activity before arrest, area of 119 calls, location of admission, presence of CPR during transportation, arrest to transportation time, CPR durations, additional procedures …

Results – Baseline variables

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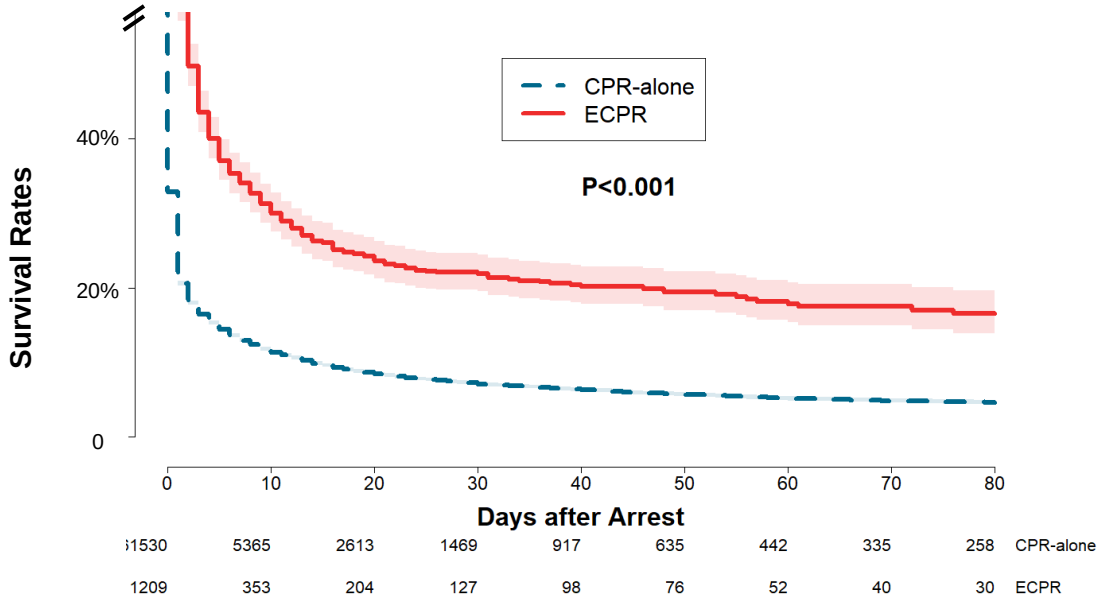
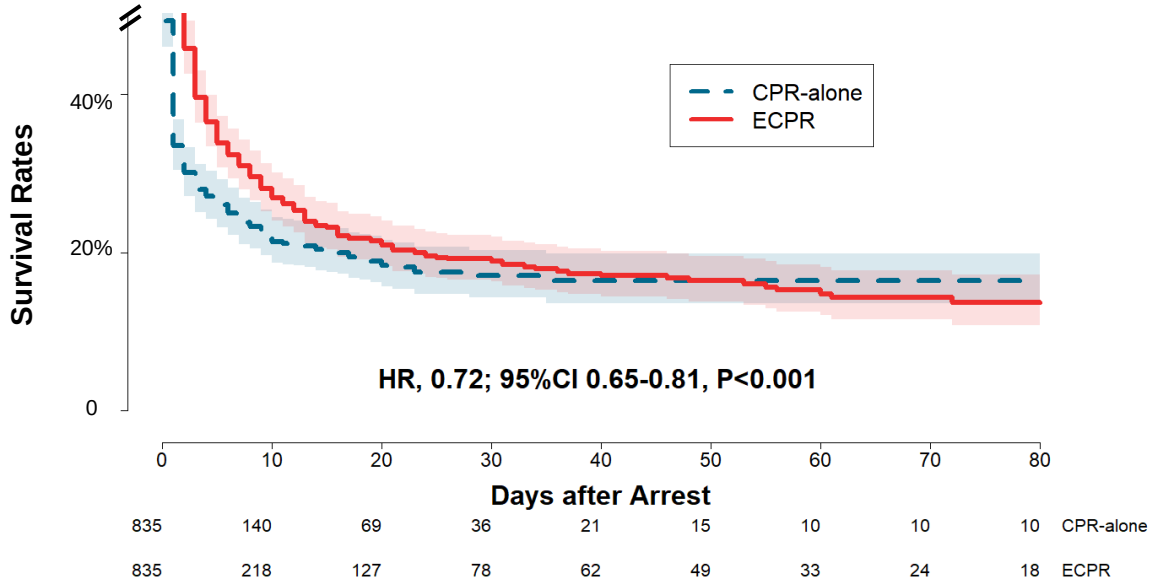
Variables	CRUDE				PS-Matched			
	Conventional (n=61530)	Extracorporeal (n=1209)	P-value	SMD	Conventional (n=835)	Extracorporeal (n=835)	P-value	SMD
Female	21572 (35.1)	241 (19.9)	<0.001	0.344	221 (26.5)	198 (23.7)	0.21	0.064
AGE	67.5 ± 18.1	56.3 ± 14.0	<0.001	0.695	55.9 ± 16.4	56.7 ± 14.5	0.30	0.051
Bystander CPR	25187 (40.9)	705 (58.3)	<0.001	0.353	483 (57.8)	467 (55.9)	0.46	0.039
119 CPR	39893 (64.8)	754 (62.4)	0.08	0.051	520 (62.3)	515 (61.7)	0.84	0.012
Public place	38183 (62.1)	629 (52.0)	<0.001	0.213	471 (56.4)	439 (52.6)	0.27	0.080
Call to Door time	32.6 ± 27.3	29.7 ± 16.4	<0.001	0.130	30.2 ± 18.1	29.6 ± 15.9	0.44	0.038
CPR time	59.8 ± 32.0	67.3 ± 33.9	<0.001	0.227	65.9 ± 38.3	65.2 ± 31.2	0.71	0.018

Results

- **Primary outcomes (Mortality)**
  - **Immediate** (CPR alone is reference (1.0))
    - **Crude**: OR 0.19 (95% CI, 0.17-0.21), **p<0.001**
    - **Adjusted**: OR 0.42 (95% CI, 0.35-0.51), **p<0.001**
  - **Early** (CPR alone is reference (1.0))
    - **Crude**: OR 0.37 (95% CI, 0.33-0.43), **p<0.001**
    - **Adjusted**: OR 0.96 (95% CI, 0.76-1.22), **p=0.76**
  - **Overall deaths**
    - **Crude**



- **Overall deaths**
  - **Adjusted**



- **Neurologic deficit (CPC >2)**

	Hazard ratio	95% CI	P value
Crude	1.74	1.44-2.1	<0.001
PS-Matched	1.01	0.74-1.40	0.93

Conclusion

- Using Korean nation-wide database, we reviewed the nation-wide data of by-stander-observed OHCA from 2015 to 2021.
  - Regional outbreaks and admission rates were diverse.
  - Transportation time (from arrest call to enter the hospital) took over 30 minutes in average.
  - There were trend to perform extracorporeal CPR for **younger** and **more survivable** OHCA conditions.

- We evaluated the clinical outcomes in this cohort depending on whether the extracorporeal CPR was performed or not.
  - Immediate and overall **survival rates were superior** in patients with extracorporeal CPR compared with the conventional CPR.
  - The results were consistent after the baseline adjustments.

- **Neurologic outcomes** were not significantly different in both groups after the baseline adjustments.

- Efforts in **swift transportation** to hospital and following **adequate extracorporeal CPR** may be helpful for by-stander-observed OHCA patients.