

Children's Mercy Kansas City

SHARE @ Children's Mercy

Research Days

GME Research Days 2022

May 3rd, 11:30 AM - 1:30 PM

Association of Patient Demographics, Code Characteristics, and Survival to Discharge After In-Hospital Cardiac Arrests in the Pediatric Intensive Care Unit

Nathan LaVoy
Children's Mercy Hospital

Let us know how access to this publication benefits you

Follow this and additional works at: <https://scholarlyexchange.childrensmercy.org/researchdays>



Part of the [Higher Education and Teaching Commons](#), [Medical Education Commons](#), [Pediatrics Commons](#), and the [Science and Mathematics Education Commons](#)

LaVoy, Nathan, "Association of Patient Demographics, Code Characteristics, and Survival to Discharge After In-Hospital Cardiac Arrests in the Pediatric Intensive Care Unit" (2022). *Research Days*. 4.
https://scholarlyexchange.childrensmercy.org/researchdays/GME_Research_Days_2022/ResearchDay2/4

This Poster Presentation is brought to you for free and open access by the Conferences and Events at SHARE @ Children's Mercy. It has been accepted for inclusion in Research Days by an authorized administrator of SHARE @ Children's Mercy. For more information, please contact hlsteel@cmh.edu.

INTRODUCTION

- Lower socioeconomic status and minority background have both been linked to worse outcomes after out-of-hospital and in-hospital cardiac arrests (IHCA)
- Estimated US incidence of pediatric IHCA is 2% with mortality of 35-45%
- Outcomes after IHCA specifically in a Pediatric Intensive Care Unit (PICU) based on patient demographics have not been well defined

METHOD

- Descriptive and retrospective study
- Data obtained from VPS ©
- Included patients 24h old to 18y old experiencing an IHCA in the PICU from 2010 to 2021
- Excluded cardiac arrests outside the PICU
- Patient demographics included race/ethnicity, age, and gender
- Code characteristics included defibrillator shocks delivered, use of CRRT, and use of ECMO
- Outcome was survival to discharge vs death
- Fisher's exact tests and Wilcoxon rank-sum test used for comparing mortality rates by categorical demographics and age, respectively

Association of Patient Demographics, Code Characteristics, and Survival to Discharge After In-Hospital Cardiac Arrests in the PICU

Outcomes after CPR			
	Survived (N=255)	Died (N=265)	P-value
<i>Age, in months - median [IQR]</i>	9 [2, 50]	14 [2, 105]	0.059
<i>Sex</i>			0.018
Female -- n (%)	106 (43.4%)	138 (56.6%)	
Male	149 (54.0%)	127 (46.0%)	
<i>Race</i>			0.009
Black	43 (51.2%)	41 (48.8%)	
Hispanic	17 (39.5%)	26 (60.5%)	
Asian	2 (25.0%)	6 (75.0%)	
White	158 (51.1%)	151 (48.9%)	
Other/Mixed	32 (57.1%)	24 (42.9%)	
Unknown	3 (15.0%)	17 (85.0%)	

Outcomes after CPR and ECMO			
	Survived (N=50)	Died (N=63)	P-value
<i>Age, in months - median [IQR]</i>	6.5 [1, 82]	5 [1, 58]	0.848
<i>Sex</i>			0.571
Female -- n (%)	27 (47.4%)	30 (52.6%)	
Male	23 (41.1%)	33 (58.9%)	
<i>Race</i>			0.629
Black	5 (33.3%)	10 (66.7%)	
Hispanic	4 (50.0%)	4 (50.0%)	
Asian	0 (0%)	2 (100.0%)	
White	34 (45.9%)	40 (54.1%)	
Other/Mixed	6 (60.0%)	4 (40.0%)	
Unknown	1 (25.0%)	3 (75.0%)	

Outcomes after CPR and CRRT			
	Survived (N=13)	Died (N=36)	P-value
<i>Age, in months - median [IQR]</i>	95 [37, 146]	10 [1, 152]	0.192
<i>Sex</i>			0.348
Female -- n (%)	4 (19.0%)	17 (81.0%)	
Male	9 (32.1%)	19 (67.9%)	
<i>Race</i>			0.577
Black	1 (33.3%)	2 (66.7%)	
Hispanic	1 (20.0%)	4 (80.0%)	
Asian	0 (0%)	3 (100.0%)	
White	9 (27.3%)	24 (72.7%)	
Other/Mixed	2 (66.7%)	1 (33.3%)	
Unknown	0 (0%)	2 (100.0%)	

Outcomes after CPR and Shocks			
	Survived (N=13)	Died (N=20)	P-value
<i>Age, in months - median [IQR]</i>	103 [9, 154]	19 [3.5, 93.5]	0.140
<i>Sex</i>			0.481
Female -- n (%)	8 (47.1%)	9 (52.9%)	
Male	5 (31.3%)	11 (68.8%)	
<i>Race</i>			0.999
Black	2 (50.0%)	2 (50.0%)	
Hispanic	1 (50.0%)	1 (50.0%)	
Asian	0 (0%)	1 (100.0%)	
White	9 (39.1%)	14 (60.9%)	
Other/Mixed	1 (33.3%)	2 (66.7%)	
Unknown	0 (0%)	0 (0%)	

Nathan LaVoy, MD; John D. Cowden, MD, MPH; Stephen Pfeiffer, MD
Children's Mercy Kansas City

Acknowledgements: Brian Lee, PhD; Stacy Pennington, RN, BSN, CCRN-K

RESULTS

- 520 patients experienced an IHCA within the PICU with 255 patients surviving (49%)
- Statistically significant difference in outcomes based on gender and race
- 276 patients identified as male (53%) having a 54% survival rate compared to 43.4% in females
- Worst outcomes in the Hispanic population with a 39.5% survival rate compared to 51.2% of patients identifying as White
- No outcome differences for those requiring CRRT, ECMO, or defibrillator shocks

DISCUSSION

- Provides framework for future studies
- Care after IHCA is multifactorial and multidisciplinary
- Did not assess CPR performance or post arrest care, work is in progress
- Race/ethnicity not differentiated, self reported
- Planning to control for severity of illness/comorbidities
- Further analysis to determine potential risk factors for mortality amongst these patients and improve our cardiac arrest outcomes remains ongoing

REFERENCES

- Andrist, Erica, et al. "Neighborhood Poverty and Pediatric Intensive Care Use." *Pediatrics*, vol. 144, no. 6, 2019, <https://doi.org/10.1542/peds.2019-0748>.
- Gupta, Punkaj, et al. "Epidemiology and Outcomes of in-Hospital Cardiac Arrest in Critically Ill Children across Hospitals of Varied Center Volume: A Multi-Center Analysis." *Resuscitation*, vol. 85, no. 11, 2014, pp. 1473-1479., <https://doi.org/10.1016/j.resuscitation.2014.07.016>.
- Haskell, Sarah E., et al. "Racial Disparities in Survival Outcomes Following Pediatric In-Hospital Cardiac Arrest." *Resuscitation*, vol. 159, 2021, pp. 117-125., <https://doi.org/10.1016/j.resuscitation.2020.12.018>.
- Naim, Maryam Y., et al. "Race/Ethnicity and Neighborhood Characteristics Are Associated with Bystander Cardiopulmonary Resuscitation in Pediatric out-of-Hospital Cardiac Arrest in the United States: A Study from CARES." *Journal of the American Heart Association*, vol. 8, no. 14, 2019, <https://doi.org/10.1161/jaha.119.012637>.