May 14th, 11:30 AM - 1:30 PM

NRP, PALS, and their utilization during code events in a pediatric quaternary hospital: a 'compressed' analysis

Mitch Kinkor
Children's Mercy Hospital

Deepa Kumar
Children's Mercy Hospital

Allison Taber
Children's Mercy Kansas City

Stephen Pfeiffer
Children's Mercy Hospital

Jessica Brunkhorst
Children's Mercy Hospital

See next page for additional authors

Authors
Mitch Kinkor, Deepa Kumar, Allison Taber, Stephen Pfeiffer, Jessica Brunkhorst, and Danielle Reed

NRP, PALS, and their utilization during ICU code events in a pediatric quaternary hospital: a 'compressed' analysis

Mitchell Kinkor, MD[1]; Deepa Kumar, MD[1]; Steve Pfeiffer, MD[2]; Ali Taber, MD[2]; Jessica Brunkhorst, MD[3]; Danielle Reed, MD[3]
[1]Department of Pediatrics, [2]Division of Critical Care, [3]Division of Neonatology

Children's Mercy Kansas City

Background

- 1-3% of hospitalized neonates and infants require cardiopulmonary resuscitation (CPR)
- Neonatal Resuscitation Program (NRP) and Pediatric Advanced Life Support (PALS) are the most common pediatric resuscitation algorithms
- Best age to transition from NRP to PALS is unclear and dependent on unit protocol at Children's Mercy
  - NRP in NICU, PALS in PICU/CICU

Objective

- **Describe clinical characteristics of code events in the NICU, PICU, and CICU for patients of the same age group (36 weeks – 18 months) undergoing resuscitation with different protocols (NRP, PALS)**

Methods/Design

- Retrospective, descriptive chart review study
- Inclusion criteria were **age** (36 weeks corrected gestational age – 18 months old), **admission to ICU**, and **code event requiring chest compressions** from Jan 2020-July 2023
- Patient characteristics and code management variables abstracted from paper and electronic medical record
- Distribution of variables compared with one way ANOVA and Chi-squared analysis with post-hoc testing

Results

Table 1. Patient Characteristics

	NICU	CICU	PICU	P-value
Total patients	44	41	20	
Total code events	79	66	25	
Gestational age (weeks)	29.1	37.1	33.9	**<0.001**
Age at code (years)	0.45	0.37	0.83	**<0.001**
Birth weight (kg)	1.32	2.8	2.3	**<0.001**
Weight at time of code	4.68	4.97	8.48	**0.004**
Respiratory support at time of code				**<0.001**
Endotracheal tube	58%	62%	44%	
Tracheostomy tube	32%	6%	36%	
Non-Invasive ventilation	6%	5%	0%	
High flow nasal cannula, nasal cannula, room air	4%	27%	20%	
Vasoactive support at time of code				**<0.001**
None	85%	29%	72%	
1 vasoactive agent	5%	41%	20%	
2+ vasoactive agents	10%	30%	8%	
Gender				**0.272**
Male	63%	64%	80%	
Female	37%	36%	20%	
Race				**0.876**
White/caucasian	61%	53%	60%	
Black/African descent	18%	24%	20%	
Other	21%	23%	20%	

Table 2. Code management

	NICU	CICU	PICU	p-value
Time to chest compressions (minutes)	2.1	1.28	1.52	**0.230**
Duration of chest compressions (minutes)	6.9	9.0	3.7	**0.150**
Use of epinephrine	42%	76%	56%	**<0.001**
Use of 'dwindle dose' epi	1%	32%	20%	**<0.001**
Use of atropine	14%	5%	0%	**0.033**
Use of bicarb	8%	42%	4%	**<0.001**
Use of calcium	8%	29%	25%	**<0.001**
Use of anti-arrhythmic	0%	6%	0%	**0.040**
Use of fluid bolus	70%	82%	84%	**0.142**
Defibrillation	4%	9%	0%	**0.161**
Primary reason for code				**<0.001**
Cardiac	20%	76%	36%	
Pulmonary	80%	24%	64%	
Outcome				**0.384**
Death during code event	9%	6%	12%	
Survival of code event, death prior to hospital discharge	14%	15%	28%	
Survival past hospital discharge	77%	79%	60%	

Conclusions

- Similar code outcomes seen across NICU, PICU, and CICU despite significant differences in management of cardiac arrest events and utilization of different resuscitation algorithms
- PICU patients in our cohort were more likely to be older and bigger at time of code
- NICU and CICU had similar patient populations in terms of weight and age with clear differences in underlying etiology of code and medication administration in the code setting

UMKC School of Medicine
KU School of Medicine The University of Kansas
Children's Mercy Kansas City