Epidemiology of Pediatric Rapid Response Calls in Children Less than Two Years Old

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Introduction

- Pediatric Rapid Response Teams (PRRT) have been shown to reduce cardiac arrest and mortality outside the Pediatric Intensive Care Unit (PICU).
- Surrogate markers of efficiency, such as measurement of Critical Deteriorations have also been used to document efficiency and team utilization.
- According to Agency for Healthcare Research and Quality (AHRQ) data from 2009, the three most common reasons for hospital admission were disorders of the Respiratory System, Digestive System and Nervous System.
- A PubMed search for epidemiologic characteristics of PRRT calls showed there is no data in the literature about reasons for PRRT activation.

Objective

To describe the epidemiology of PRRT calls in children less than two years old at a tertiary care children’s hospital.

Methods

Study Design: Prospective Cohort of all children admitted to tertiary care children’s hospital within a hospital; exclusion criteria included children in PICU, NICU or Newborn Nursery, as well as charts with incomplete data about the PRRT response.

Time Frame: June 2009 through March 2013

Setting: University-based, tertiary care children’s hospital within a hospital

Data Collection: Data on PRRT calls were collected in the Electronic Medical Record (EMR) and synthesized into a monthly report which included name, medical record number and disposition. Chart review of each PRRT activation was performed.

Data Analysis: Descriptive statistics, Chi-square tests for categorical variables, t-tests for continuous variables. Analysis performed with JMP® 10.0 (SAS Institute, Cary, NC. 2012)

IRB Approval: The Medical IRB at the University of Kentucky approved this study

Results

- Cohort contained 25,689 admission, 80,660 bed-days, 405 PRRT calls
- 302 PRRT calls contained complete information (75% of records)
- 193 records were for children less than two years old
- Rate of PRRT utilization was 5.02 calls per 1000 bed-days
- Male patients accounted for 59% of PRRT calls (p=0.02)
- PICU mean length of stay (LOS) significantly differed by age (p=0.02)
- 7.06 days ± 7.52 (95%CI: 5.42, 8.70) for children <6 months old
- 3.86 days ± 5.58 (95%CI: 1.74, 5.98) for children 6-24 months old
- 60% of children 6-24 months who had a PRRT call had a chronic disease compared to only 24% of children <6 months old (p=0.0001)

Conclusions

- Male gender was an independent risk fact for PRRT activation, especially in children <6 months old
- Chronic disease appears to be a risk factor for PRRT activation in children 6-24 months old
- PICU transfers occur frequently as a result of PRRT responses
- Once transferred to the PICU, LOS is increased for children <6 months old compared to children 6-24 months old
- Although not statistically significant, the highest densities of calls occur around nursing shift changes
- Respiratory distress, arrhythmias and seizures were the most common reasons for PRRT activation; this mirrors many of the top reasons for hospital admission according to AHRQ.

References


Figure 1: Violin plot of call density over time as team size varied. The violin plots are defined as box plots where only call residents were covering the patients. This occurs during overnight and weekend hours. Width of the colored band represents density of PRRT calls during that time period.

Figure 2: Age-stratified reasons for PRRT activation. After review of PRRT records in the EMR, activations were classified into broad categories.

Figure 3: Categories of underlying diseases in children who received PRRT Services.