

Prehospital Pediatric Arrests Receiving Epinephrine (PREPARE) in the United States

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Background: Current PALS algorithms recommend that epinephrine be administered in cardiac arrest. Out-of-hospital cardiac arrest survival in pediatric patients is poor; 3% for infants and 9% for children/adolescents. Despite emphasis on improving pediatric out-of-hospital care, there has been no increase in survival rates over the past 20 years. This is compared to in-hospital pediatric cardiac arrest, which has improved from 9% in 1980 to 27% in 2006. The purpose of this study was to evaluate the current rate of out-of-hospital epinephrine administration in pediatric and adult cardiac arrest cases.

Methods: We analyzed data from the 2012 NEMESIS Data Set containing 19,831,189 records and included all with an out-of-hospital diagnosis of cardiac arrest. We divided them into pediatric (0-18 years) and adult (≥ 19 -100 years) age groups. We excluded records with a cardiac arrest etiology due to trauma or unknown and where no resuscitation attempt was made. We used descriptive statistics to report the percentages of out-of-hospital pediatric cardiac arrest cases that received epinephrine and stratified them by pediatric age groups and compared them to the adult cohort.

Results: We identified 1,465 pediatric and 60,824 adult records. Epinephrine 1:10,000 administration was much lower in pediatric cases compared to adults. Epinephrine administration was documented in 34.6% of patients 0-18 years and 45.6% for adult cases ($p < 0.0005$). In patients 0-18 years, there was no difference in the rate of administration for cardiac arrest prior to EMS arrival compared to patients with cardiac arrest after EMS arrival (34.7% and 34.0%, $p = 0.89$). In adults, the rate for pre-EMS arrival cases was higher than for post-EMS arrival cases (46.4% and 41.6%, $p < 0.0005$), but each of these rates remained higher than the rate for pediatric cases ($p < 0.0005$).

Conclusion: Despite guidelines indicating epinephrine administration in cardiac arrest, actual epinephrine administration in pediatric cases was low, averaging 34.6% in pediatric cases. Furthermore the rate of epinephrine administration in pediatric cases was substantially lower than in adults. Investigation is needed to evaluate the reasons for the low rate of epinephrine administration in out-of-hospital cardiac arrests and to determine if an association exists between low epinephrine rate and survival.