9th Mediterranean Emergency Medicine Congress-Global Research on Acute Conditions Team (*MEMC-GREAT*) Top Meeting Abstracts

1 Paediatric Traumatic Cardiac Arrest in England and Wales: A 10-Year Epidemiological Study

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Objective: Traumatic cardiac arrest in children has traditionally been described as having a poor outcome. Survival rates vary widely between studies with higher rates observed from mechanisms leading to a respiratory cause of traumatic cardiac arrest (e.g., drowning and hanging). However, there is little evidence regarding outcomes following traumatic cardiac arrest in children. The primary aim of our study was to describe 30-day survival following traumatic cardiac arrest. Secondary aims were to provide an analysis of injury patterns, describe the functional outcome at discharge and to report the association between survival and interventions performed.

Design and Method: We conducted a population-based analysis for all children (<18 years) on the Trauma Audit Research Network database from 2006-2015. Patients with traumatic cardiac arrest in the pre-hospital setting and/or in the emergency department (ED) were included. Data are described as number (%) and median (interquartile range) as appropriate. We used survival odds ratios (95% confidence intervals [CI]) and chi-square tests during statistical analysis.

Results: During the study period, 21,710 paediatric patients were included in the database with 129 (0.6%) sustaining traumatic cardiac arrest and meeting study inclusion criteria. The majority had a prehospital traumatic cardiac arrest (103 [79.8%]). Overall, 62.8% were male, aged 11.7 years (3.4-16.6), and with Injury Severity Score 34 (25-45); 110 (85.3%) had blunt injuries, with road-traffic collision the most common mechanism (56.6%). Of these 129 patients, 123 (95.3%) had severe haemorrhage and/or traumatic brain injury.

Overall 30-day survival was 5.4% (95% [CI 2.6-10.8]). "Prehospital only" traumatic cardiac arrest (13.0%) had a significantly higher survival than "prehospital and ED" traumatic cardiac arrest (1.8%), (p=0.0430). There were no survivors from "ED only" traumatic cardiac arrest. Treatment at a major trauma centre was associated with a statistically significant increase in survival (p=0.0186).

Conclusion: This study has demonstrated that resuscitation of children in the rare event of traumatic cardiac arrest is not futile, with overall outcomes comparable to survival rates seen in adults. Survival from prehospital traumatic cardiac arrest is possible, and the early identification and aggressive management of these patients is advocated.

2 Triage Accuracy and Variability Using the Emergency Severity Index: A Multinational Study

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Objective: The Emergency Severity Index (ESI) is a five-level emergency department (ED) triage scale that relies heavily on operator experience and intuition. Reports from countries where emergency medicine is a relatively young specialty suggest sub-optimal performance of the scale and high variability of triage score designation by end users. In this internationally collaborative study we used standardized triage scenarios to assess the degree of accuracy and variability in ESI score assignment in three different countries.

Design and Method: We used 25 patient scenarios from the ESI handbook to evaluate accuracy and inter-rater reliability of triage score assignment in a cohort of triage nurses from EDs in the United States, United Arab Emirates and Brazil. All participants had undergone formalized training and demonstrated proficiency in use of the scale. We defined accuracy as concordance with the handbook key, and we made comparisons across sites using ANOVA. Inter-rater reliability was calculated by Krippendorff's alpha and was assessed within and across sites. Sub-analyses included impact of scenario type and years of nursing experience.

Results: A total of 87 nurses participated (35 in the UAE, 30 in Brazil, 25 in the U.S.). Overall, only 59.2% of scenarios (1,288/2,175 scenarios) were scored correctly. There was no difference in pooled score-assignment accuracy between sites (U.S. 61.3%, UAE 58.7%, Brazil 58.3%, p = 0.70). Performance was lowest for pediatric cases, and nursing experience had no impact on accuracy. Inter-rater reliability was moderate and consistent across sites (Krippendorff's alpha = 0.73).

Conclusion: In this multinational study, we observed uniformly low accuracy of triage score assignment across all settings and a high degree of variability in score assignment both within and across sites that was not influenced by nursing experience or practice setting. While the ESI is made efficient and popular by its simplistic algorithm and reliance on clinical judgment, these same attributes may allow for a large degree of practice variation.