Paramedic – Evidence Based Medicine (P-EBP) Program

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Endotracheal Intubation versus supraglottic airway placement in out-of-hospital cardiac arrest*

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Clinical Scenario:
Paramedics arrive on scene to find a 62-year-old male patient after an witnessed cardiac arrest. The patient has no obvious signs suggesting a difficult airway. He was down for less than 10 minutes and bystanders were preforming only chest compressions prior to arrival. In effort to achieve optimal ventilations with minimal interruptions, they apply a supraglottic airway device in effort to maximize time doing chest compressions along with defibrillation.

PICO (Population – Intervention – Comparison – Outcome) Question:
For out of hospital cardiac arrest patients requiring airway management do supraglottic devices compared to ETI placement improve time until adequate ventilations are achieved and overall patient outcome.

Search Strategy:
(prehospital OR out-of-hospital) AND (airway management OR ETI OR endotracheal intubation) AND (rescue airway OR extraglottic OR supraglottic) AND (ventilations OR time for insertion)

Search Outcome: *82 results*

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Wang HE. 2012	OHCA 10,455	Systematic Review	- Primary outcome	81.2% received successful	+ Large sample size

		LOE 1	was survival to hospital discharge with satisfactory functional status, defined as a Modified Rankin Scale - Secondary outcomes included ROSC, 24 h survival, and major airway or pulmonary complications.	ETI and 18.8% received successful SGA Survival to hospital discharge with satisfactory functional status was ETI 4.7% and SGA 3.9% Compared with SGA, successful ETI was associated with increased survival to hospital discharge, ROSC and 24 h survival. ETI was not associated with secondary airway or pulmonary complications.	- Specify which type of SGA used - ROC consisted of highly trained EMS agencies and superior ETI and resuscitation skills may have manifested as improved ETI survival over SGA. - It is clear that a prospective randomized clinical trial is optimal strategy for comparing the relative merits of ETI and SGA. - The characteristic of patient population, practitioner experience and training should be documented when choosing primary or preferred airway management strategy.
Benoit JL. 2015	Out of Hospital Cardiac Arrest patients total: 75,649	Meta-analysis of observational cohort studies	Primary outcome is ROSC	Total patients to obtain ROSC was higher in ETI with ETI vs. SGA [33,265 vs.	+ Baseline demographics such as age, initial cardiac

	Endotracheal Intubation (ETI): patients: 34,533 Supraglottic Airway patients (SGA): 41,116	LOE1	Secondary is survival to hospital admission Third outcome for survival to hospital discharge Fourth outcome is neurologically intact survival to hospital discharge as Modified Rankin Scale or Glasgow Outcome Scale	40594, Odds ratio-1.28(CI1.05-1.55)] Total patients to survive to hospital admission was higher in ETI with ETI vs. SGA [21,373 vs. 10,809, OR – 1.34(CI1.03-1.75)] Total patients with neurologically intact survival at discharge was higher in ETI with ETI vs. SGA [28,911 vs. 38,918, OR - 1.33(CI1.04-1.69)]	rhythm, witness status and bystander CPR or AED use was similar between groups + 95% Confidence Interval + Documented location type and ambulance response time - Not every study was included in each result individual results assessment, causing varies in total patient numbers in each result analysis area - No randomized controlled trials exist comparing these two airway interventions resulting in an overall low quality of evidence - Some patients may have received SGA after failed ETI which could result in decreased survival rates after failed ETI due to decreased survival if CPR was interrupted or hypoxia

					occurred

Comments:
There are many factors that can affect a patient's outcome besides the way an airway is managed including past medical history or underlying conditions that are likely to have poor outcomes, transport times, extrication difficulties, patient's anatomy, and paramedic's experience. Waveform capnography for prehospital care would be very beneficial to have as a definitive tool on the trucks and would be the best way to confirm patient's respirations while on route. This would help decrease the rate of tube dislodgement going unnoticed while on route. This would especially be important for paramedics as they often need to reposition patients while extricating and transporting through all types of terrains to get to hospital.

Consider:
Based on the results of these articles, I would not change practice because it all depends on the individual paramedic's preference. When you work rural EMS like in Nova Scotia it is not always common to get the experience with intubation as much as you would like. This makes it difficult to perform the skill well without the muscle memory. In this case, a SGA (King LT for EHS) is sometimes more beneficial to transport with rather than utilizing valuable time that should be spent on the chest or causing a period of hypoxia due to a failed attempt.

Clinical Bottom Line:
Although, some of this data has intriguing results, there is not enough quality evidence to show that OOHCA SGA is better than ETI for patient outcome because these patients will require intubation in the hospital and SGA does not prevent from aspiration, pneumothorax or airway bleeding.

References:
Henry E. Wang, Daniel Szydlo, John A. Stouffer, Steve Lin, Jestin N. Carison, Christian Vaillancourt, Gena Sears, Richard P. Verbeek, Raymond Fowler, Ahamed H. Idris, Karl Koenig, James Christenson, Anushirvan Minokadeh, Joseph Brandt, Thomas Rea, and The ROC Investigators, (2012) *Resuscitation,* (83) 1061 - 1066

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