Paramedic – Evidence Based Medicine

Paramedic CAT (Critically Appraised Topic) Worksheet

Title: *Advanced Airway Management in medical OOHCA: a comparison between Supraglottic Airways (SGA), Endotracheal Intubation (ETI) and Survival*

Report By: Anna Waher, Jill Greenwood, Lucy Fredericks, Nichola Erikson Henne, and Jade McInnes

2nd Party Appraiser: *Jen Greene*

Clinical Scenario: Arrival at a 48-year-old male patient in a non-traumatic cardiac arrest. Compressions and ventilations with OPA and BVM are being performed by the firefighters on scene. Patient's wife states he only has hypertension which is controlled by medications and that the doctor advised him to lose 10 pounds. Other than that, the patient's history is unremarkable. As this patient is relatively young, without significant medical history it is deemed that a favourable outcome is possible. This leads us to suspicion and interest regarding which type of advanced airway procedure would be of the greatest benefit, and the rationale behind the airway choice in providing the most favourable outcome.

PICO (Population – Intervention – Comparison – Outcome) Question:

P – Adult Out of Hospital, non-traumatic, cardiac arrests

I – Initial use of Supraglottic Airway Device (SGA)

C – Initial use of Endotracheal Intubation (ETI)

O – Affect on survivability

Question:

In out of hospital medical cardiac arrests, does using a supraglottic airway device (SGA) versus endotracheal intubation (ETI) affect patient survivability?

Search Strategy:

Database: PubMed

- cardiac arrest, out of hospital[MeSH Terms]
- (((((supraglottic airway) OR (SGA)) OR (i-gel)) OR (king airway)) OR (laryngeal mask)) OR (extraglottic airway)
- endotracheal intubation[MeSH Terms]

Search string used in PubMed:

"intubation, intratracheal"[MeSH Terms] AND ((("supraglottal"[All Fields] OR "supraglottic"[All Fields]) AND ("airway"[All Fields] OR "airway s"[All Fields] OR "airways"[All Fields])) OR "SGA"[All Fields] OR "i-gel"[All Fields] OR ("king"[All Fields] AND ("airway"[All Fields] OR "airway s"[All Fields] OR "airways"[All Fields])) OR ("laryngeal masks"[MeSH Terms] OR ("laryngeal"[All Fields] AND "masks"[All Fields]) OR "laryngeal masks"[All Fields] OR ("laryngeal"[All Fields] AND "mask"[All Fields]) OR "laryngeal mask"[All Fields]) OR ("extraglottic"[All Fields] AND ("airway"[All Fields] OR "airway s"[All Fields] OR "airways"[All Fields]))) AND "out of hospital cardiac arrest"[MeSH Terms]

Search Outcome:

70 Results

Relevant Papers:

AUTHOR, DATE	POPULATION: SAMPLE CHARACTERISTICS	DESIGN (LOE)	OUTCOMES	RESULTS	STRENGTHS/ WEAKNESSES
Benger, 2018	9296 adult OOHCA (non-traumatic)	Level 1 RCT	Primary outcome: Modified Rankin at hospital discharge at 30 days Secondary outcomes: Ventilation success	Modified Rankin at hospital discharge at 30 days: 311/4882 (6.4%) SGA; 300/4407 (6.8%) ETI; OR 0.92 (0.77-1.09) Ventilation success: 4255/48368 (87.4%) SGA vs 3473/4397 (79.0%) ETI; OR 1.92	**Strengths:** large n; good follow up; even population distribution; enrollers were invested in the project. **Weaknesses:** crossover between groups; confounding hospital care; imbalance in enrolled

				(1.66-2.22); P <0.001	groups.
			Regurgitation	Regurgitation 1268/4865 (26.1%) SGA vs 1072/4372 (24.5%) ETI OR 1.08 (0.96-1.20);	
			Aspiration	Aspiration: 729/4824 (15.1%) SGA vs 647/4037 (14.9%) ETI OR 1.1 (0.88-1.16)	
Beniot, 2015	10 studies represented 34,533 ETI patients and 41,116 SGA patients.	Level 1 Meta-analysis	Primary outcomes: ROSC, survival to hospital admin, survival to hospital discharge, neuro survival at discharge	Patients who received ETI had statistically significant higher odds of ROSC (odds ratio [OR] 1.28, 95% confidence interval [CI] 1.05–1.55) survival to hospital admission (OR 1.34, CI 1.03–1.75), and neurologically intact survival (OR 1.33, CI 1.09–1.61) compared to SGA. Survival to hospital discharge was	**Strengths:** Good search strategy with inclusion/exclusion criteria and grading system to yield high quality studies. **Weaknesses:** restricting inclusion/exclusion criteria resulted in gaps of information (SGA specific) due to observational studies and lack of properly designed studies.

				not statistically different (OR 1.15, CI 0.97–1.37).	
Wang, 2018	3004 adults, OOH cardiac arrests	Level 1 RCT	72 hour survival, ROSC, Survival to discharge, Favourable neuro status at discharge	72 hour survival: 18.3% SGA vs 15.4% ETI (OR: 2.9% [95% CI, 0.2%-5.6%]; P = .04). ROSC: (27.9% SGAvs 24.3%ETI; OR: 3.6% [95% CI, 0.3%-6.8%]; P = .03); Survival to discharge: (10.8% SGA vs 8.1%ETI; OR: 2.7% [95% CI, 0.6%-4.8%]; P = .01); Favorable neurological status (7.1% SGAvs 5.0% ETI; OR: 2.1% [95% CI, 0.3%-3.8%]	**Strengths:** -Large sample size and large geographical area. -Representative of population. -Able to minimize lost data by incorporating other systems to engage in further enrollment should others be unable to complete **Weaknesses:** -No additional training was given or QI monitoring-existing protocols were used throughout the groups -Lacked assessment of compression and ventilation quality -Focused on LT rather than other SGA -Not all elements were blinded

Comments: *Any additional information about your search results.*

Studies involving traumatic cardiac arrests and pediatric populations were excluded from our research. Another excluded study was one that involved comparing SGA vs ETI vs BVM in a systematic review. This study, although a high level of evidence, was excluded because our PICO did not include BVM as an intervention or comparison.

Consider: *Why would you NOT change practice, based on these articles?*

There is not a large significance to improved patient outcomes to go from one to the other. Both articles show some significance on the use of SGAs instead of ETI, however, it is not significant enough. One of the study's that saw and reported a significant improvement of SGA's versus ETI has uncertainty to its reproducibility as they had many crossovers, training and quality control issues, and only lent itself to LT's versus other SGA's.

Clinical Bottom Line:

Both SGA and ETI have benefits to patient care. This review has shown that while there is often no statistical significance in using SGA over ETI, each procedure has its place in our practice. As practitioners we have to be cognisant of the possible complications for the patient in front of us and plan our advanced airway management in such a way that circumvents as many complications as we can.

References

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