

The use of I-Gel Extra-Glottic Device versus Other Emergency Airway Management Modalities in the Prehospital Setting: A Tailored Rapid Review for Emergency Health Services Nova Scotia

A product of the Dalhousie University Division of EMS

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Objective:

To collect and report the results of the most current and best available evidence on the use of I-Gel extra-glottic devices (EGD) versus other devices in prehospital emergency airway management by paramedics.

Review Question:

P – In adult patients requiring emergency airway management

I – does the use of an I-Gel EGD

C – vs. other airway devices

O – result in differences related to:

- Survival
- Time or success of insertion
- Adverse events
- Oxygenation

Inclusion Criteria:

English language available

Must report on I-Gel device

Primary literature or formal systematic review

Must include an a priori outcome of interest

Setting must be prehospital, ED, OR/anesthesia, cadaveric, simulation

Exclusion Criteria:

Protocols

Incomplete studies

Pediatric only (EGD are not used in pediatric patients in our setting)

Studies investigating EGDs as a conduit to ETI

Low-middle income/resource settings

Animal studies

Search:

Search performed on February 19, 2019 in PubMed.

(I-gel OR King LT) AND (((randomized controlled trial[pt] OR controlled clinical trial[pt] OR randomized[tiab] OR placebo[tiab] OR "Clinical Trials as Topic"[mesh: noexp] OR randomly[tiab] OR trial[ti]) OR ("Epidemiologic Studies"[mesh: noexp] OR "Case-Control Studies"[mh] OR "Cohort Studies"[mh] OR case control[tw] OR case series[tw] OR case report*[tw] OR case study[tw] OR case studies[tw] OR cohort study[tw] OR cohort studies[tw] OR cohort analy*[tw] OR follow up study[tw] OR follow up studies[tw] OR observational study[tw] OR observational studies[tw] OR longitudinal[tw] OR retrospective[tw] OR cross sectional[tw] OR "Cross-Sectional Studies"[mh]) OR (systematic[sb]))) NOT (editorial[pt] OR guideline[pt] OR letter[pt] OR news[pt] OR newspaper article[pt] OR (animals[mh] NOT humans[mh])))

Note: Because of this and familiarity with the existing body of evidence; we justify limiting our search to only the best available study designs. We will preference studies in the EMS setting comparing I-GEL to Laryngeal tube (LT). LT devices are currently used in this service; this is the reasoning to prioritize literature using this comparison. Simulation studies and operating suite studies will be considered only if there is insufficient literature in the EMS setting.

Results:

Titles: 236

Included for abstract review: 60

Included for analysis: 6

Table 1: Included studies

Author	Year	Setting	Design	LOE	Population	Interventions	Outcomes	Results	RoB
Benger ¹	2016	EMS	Cluster-randomized trial	1	OOHCA (non-traumatic) (n= 615)	I-Gel, LMA Supreme, regular care (BVM, LMA or ETI)	Feasibility	Feasible	Low (Cochrane ROB tool) ²
							First pass success	Non significant difference; ETI 85%, I-Gel 79%, LMA: 75%	
							ROSC	Non significant difference; usual care: 33%, I-Gel: 31%, LMA: 31%	
							Survival to admission	Non significant difference; usual care: 21%, I-Gel: 22%, LMA: 17%	
							Survival to DC	Non significant difference; usual care: 9%, I-Gel: 10%, LMA: 8%	
							Survival to 90 days	Non significant difference; usual care: 8%, I-Gel: 9%, LMA:7%	
							Neurocognitive status (CANTAB DMS scale; max 15)	Non significant difference; usual care: 9.9/15, I-Gel: 11.8/15, LMA: 10.7/15	
							Quality of life (DASS score; 0=best)	Non significant difference; usual	

							health) to 42=worst health)	care: 15.4/42, I-Gel: 27.1/42, LMA: 18.3/42	
MacConachie-Middleton ³	2014	EMS	RCT	1	OOHCA (all comers) (n=51)	I-GEL, PSS-LMA	Success	Significant difference favouring I-Gel; LMA 50% vs Igel 90%; p value = 0.023	Low (Cochrane ROB tool) ²
							Number of insertion attempts (1 or 2)	Non significant difference; LMA=1 vs IGEL; 1 p value = 0.67	
							ROSC	Non significant difference; LMA 25% vs I-Gel 35%; p value = 0.66.	
							Paramedic-recorded 'ease of insertion' (1-5 scale)	Significant difference favouring I-Gel; LMA 3 vs IGEL 2; p value = <0.001	
Duckett ⁴	2014	EMS	Retrospective cohort (CQI)	2	OOHCA (all comers) (n=89)	Adjuncts, I-gel, ETI	Success rate	Adjuncts 100%, I-gel 93% success, 88% ETI success. (note: no calculation for significance)	Low (JBI cohort ROB tool) ⁵
							Paramedic choice	29.95% Paramedic choice was I-Gel	

Häske ⁶	2013	EMS	Prospective Cohort	3	OOHCA (no TBI) (n=70)	I-Gel	First pass success	90% insertion first pass success, 7% on 2nd and 3% on third attempt.	Low (JBI cohort ROB tool) ⁵
							Ease of insertion	80%, (n = 56) of insertions were rated as easy, 16%, (n=11) as moderately difficult, and 4%, (n = 3) difficult.	
							Adequacy of ventilation	91%,(n=64) of patients were judged to have adequate ventilation. In two patients, no ventilation with the I-gel was possible (presence of re-gurgitation)	
							Presence of a leak	No leak in 80% (n = 56), moderate leak in 17% (n = 12), and a major leak not enabling ventilation in 3% (n = 2).	
							Whether ventilation is possible without interrupting chest compressions	The I-gel enabled continuous chest compressions without pauses for	

								ventilation in 74% (n = 52) of CPR attempts.	
Häske ⁷	2016	EMS	Case series	3	Failed ETI TBI pts (n=2)	I-Gel	Ventilation	Pt 1: ventilated adequately with SpO2 of 98% and etCO2 of 33 mm Hg, PaO2 of 123 mm Hg and a PaCO2 of 53 mm Hg. Pt 2 SpO2 of 99% and etCO2 of 35 mm Hg	Low (JBI case series ROB tool) ⁸
Baker ⁹	2011	EMS	case report	3	Drowning victim (n=1)	I-Gel and LMA	Ventilation	Inadequate ventilation presumed failure due to high pressures required during ventilation of a drowning victim.	low (JBI case report ROB tool) ¹⁰

Discussion:

We did not find any studies reporting on our comparison of interest (I-Gel vs LT). However, we found six studies reporting on the I-Gel, conducted in the prehospital setting. This setting is most generalizable to our population; we determined it was justified to exclude operating suite or simulation studies at this point. The I-gel has been extensively studied in anesthetized patients. A 2014 meta-analysis of 2060 elective surgery patients found a significant difference favouring I-gel (MD -1.46 95%CI [-2.60 - -0.33]) compared to LT for insertion times.¹¹ There have been anecdotal concerns when using the I-gel regarding the inherent temperature fluctuations in the prehospital setting. Prewarming the I-gel was examined in a 2012 cohort study of 180 anesthetized patients. They

determined that insertion time, attempts, inspiratory pressure, leak pressure, and leak volume were not significantly different between prewarmed and room temperature I-gel devices.¹²

Conclusion:

We find high-quality evidence to suggest that the I-gel EGD may be an effective airway management device in the prehospital setting. In OOHCA patients the I-gel preforms at least as well for survival outcomes and consistently well or better than the LMA for successful placement. Paramedics rate the I-gel as easy to use. This evidence is limited to adult OOHCA patients however very low-quality evidence suggests effective ventilation TBI patients but not in drowning victims.

Clinical bottom line:

The I-Gel EGD preforms as well for patient-oriented outcomes and as well as or better for successful placement compared to LMA in adult OOHCA.

References:

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