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Review Article

A systematic review and meta-analysis of the i-gel® vs laryngeal mask airway in adults*

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Summary

We systematically reviewed 31 adult randomised clinical trials of the i-gel® vs laryngeal mask airway. The mean (95% CI) leak pressure difference and relative risk (95% CI) of insertion on the first attempt were similar: 0.40 (−1.23 to 2.02) cmH_2O and 0.98 (0.95–1.01), respectively. The mean (95% CI) insertion time and the relative risk (95% CI) of sore throat were less with the i-gel: by 1.46 (0.33–2.60) s, $p = 0.01$, and 0.59 (0.38–0.90), $p = 0.02$, respectively. The relative risk of poor fibreoptic view through the i-gel was 0.29 (0.16–0.54), $p < 0.0001$. All outcomes displayed substantial heterogeneity, $I^2 \geq 75\%$. Subgroup analyses did not decrease heterogeneity, but suggested that insertion of the i-gel was faster than for first-generation laryngeal mask airways and that the i-gel leak pressure was higher than first generation, but lower than second-generation, laryngeal mask airways. A less frequent sore throat was the main clinical advantage of the i-gel.

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Introduction

The laryngeal mask airway (LMA) was introduced in 1982 to simplify airway management. It can often be used instead of tracheal intubation, thereby avoiding complications specifically associated with insertion of a tracheal tube [1]. Positioning of the first generation of LMAs (Classic®, la Premiere®, AuraOnce®, Solus®, Unique®) was often difficult. They were initially intended for use in spontaneously breathing patients at relatively low airway pressures, with worse performance during positive pressure ventilation, particularly in obese patients or during laparoscopy [2]. Their use was also limited by the potential risks of aspiration and instability following insertion [3]. Several modifications were introduced to reduce these problems. The second generation of LMAs, the Proseal® and Supreme®, allow passage of a tube for gastric decompression.

The i-gel® also has a gastric channel, but it has a solid cuff made of a thermoplastic elastomer, intended to provide a seal by conforming to differently shaped throats without inflation. Several studies have compared the i-gel with various types of LMA, but their respective performance remains unclear. The aim of this systematic review was to compare the clinical efficacy of the i-gel with that of the LMA.

Methods

We searched the following databases to May 2013: MEDLINE; CENTRAL; Embase; Web of Knowledge; the internet via the science-specific search engine

Scirus (now retired) and the Virtual Health Library (see Appendix for the search strategy). In addition, we searched our personal files. We included human adult randomised controlled trials (RCTs), including crossover studies, in any language that compared the i-gel with any type of LMA. We extracted the following outcomes: leak pressure; insertion time; rate of first-time insertion; rate of sore throat; and fibreoptic laryngeal view.

Oropharyngeal leak pressure was defined as the airway pressure in the anaesthetic breathing system at which gas flow through the mouth was heard, irrespective of the method used [4]. We used the leak pressure reported for the first LMA cuff pressure when RCTs tested different LMA cuff pressures. We used the mean insertion time difference between the i-gel and LMA: the insertion time was from picking up the device to the first end-tidal carbon dioxide trace. We analysed the highest rate of sore throat reported before discharge from the post-anaesthesia care unit. The fibreoptic view through the main supraglottic device channel was scored using Cook and Cranshaw's [5], Brimacombe and Berry's [6] or Van Zundert and Brimacombe's [7] classification. We defined the worst laryngeal view (i.e. views that could not permit tracheal intubation through the supraglottic device) as: Brimacombe's class 1, Cook's class 4 and Van Zundert's class 0 or 1.

Two authors (JdM and LR) independently extracted: study name, first author, year of publication and journal; study design; participant number and characteristics; type of surgery; intervention and comparisons; and outcomes. The authors assessed RCTs for risks of bias [8]. Two other authors (DB and JXM) resolved disagreement through discussion. We categorised LMA types [9]:

- First generation (Classic, la Premiere, AuraOnce, Solus, Unique);
- Second generation (ProSeal, Supreme).

Within individual RCTs, we combined results from LMA types of the same generation. We adjusted for multiple comparisons (i-gel vs both generations of LMA) by dividing the numerator and denominator by two for i-gel categorical outcomes and by appropriate adjustments for continuous outcomes [10]. We used the inverse variance method to calculate the pooled mean (SE) differences. We estimated mean (SD) from median (IQR or range) [10, 11]. We used the Mantel–Haenszel method to calculate the relative risk (95% CI) for categorical outcomes. Statistical heterogeneity was assessed by the Q statistic and I^2 values, with I^2 thresholds for low (25–49%), moderate (50–74%) and substantial ($\geq$ 75%) heterogeneity. We used a fixed-effect model to calculate pooled estimates and a random-effects model in cases of substantial heterogeneity. We conducted subgroup analyses for: first- vs second-generation LMA; neuromuscular blockade vs none. We conducted sensitivity analyses: the sequential effect on results by excluding studies; the impact of LMA cuff pressure; the exclusion of crossover studies; and the impact of time from airway insertion to measurement of the leak pressure. We constructed funnel plots and tested for asymmetry with Egger's linear regression. All tests were two-sided and we considered $p < 0.05$ statistically significant. All analyses were performed using R (R 2012; Foundation for Statistical Computing, Vienna, Austria) with R packages meta [12], rmeta [13] and metafor [14].

Results

We included 31 RCTs [7, 15–44] (Fig. 1 and Table 1), five of which were crossover studies [29, 39, 41, 42, 44]. All participants underwent elective surgery. First- and second-generation LMAs were studied in 18 and 16 RCTs, respectively. Fifteen RCTs included paralysed participants. Two RCTs included patients with anticipated

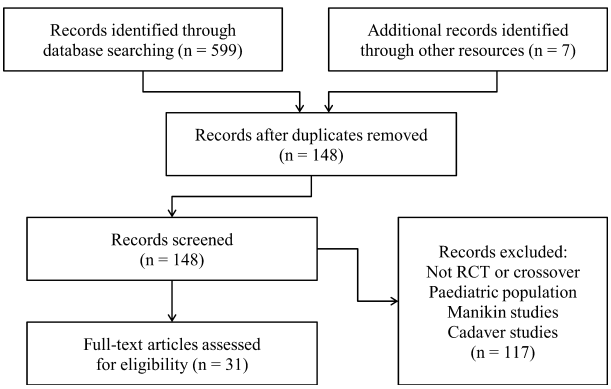

Figure 1 PRISMA flowchart. RCT, randomised controlled trial.

Table 1 Characteristics of randomised clinical trials or crossover trials comparing the i-gel with laryngeal mask airways.

Reference	Study details	Allocation i-gel or LMA*	Outcomes	Other outcomes
Elarbi et al. [21]	Elective surgery (reported in abstract)	26 to i-gel 26 to Classic	Insertion at first attempt	Ease of insertion; insufflation pressure; leak fraction; trauma
Fernandez Diez et al. [23]	ASA 1–2, day surgery Excluded difficult airways and BMI > 35 $kg.m^{-2}$	44 to i-gel 42 to Supreme (60 cmH_2O)	Leak pressure Insertion time† Sore throat Fibreoptic view	Ease of insertion; inspiratory pressures, tidal volume and compliance; respiratory rate
Francksen et al. [24]	ASA 1–3, minor gynaecological surgery Excluded difficult airways and BMI > 35 $kg.m^{-2}$	40 to i-gel 40 to Unique (20 or 30 or 40 ml)	Leak pressure Insertion time Insertion at first attempt Sore throat Fibreoptic view	Cuff pressures; dysphagia; ease of handling; hoarseness; rate of successful ventilation; tidal volumes
Heuer et al. [28]	ASA 1–2, elective day surgery Excluded difficult airway	40 to i-gel 40 to Classic, Proseal and AuraOnce (all 60 cmH_2O)	Insertion time Insertion at first attempt Sore throat	Airway pressures; cough; discomfort; dysphagia; nausea; vomiting; trauma
Janakiraman et al. [29]	ASA 1–2, elective surgery Excluded difficult airway Crossover study	50 to i-gel 50 to Classic ($\leq$ 60 cmH_2O)	Leak pressure Insertion at first attempt Fibreoptic view	Complications; ease of insertion
Keijzer et al. [31]	ASA 1–2, elective peripheral surgery Multicentre study	111 to i-gel 107 to Premiere (< 21 ml)	Leak pressure Sore throat‡ Fibreoptic view	Dysphagia; dysphonia; ease of insertion; neck pain; numb tongue; other complaints
Singh et al. [38]	ASA 1–2, elective peripheral surgery Excluded difficult airway Paralysed with rocuronium	30 to i-gel 30 to Proseal	Leak pressure Insertion at first attempt	Blood on device; ease of gastric tube placement; hoarseness; regurgitation; trauma to lip, teeth or tongue
Theiler et al. [41]	ASA 1–3, 18–80 years, elective surgery Excluded BMI > 35 $kg.m^{-2}$ Simulated difficult airway scenario (mouth opening limited by collar) Crossover study	56 to i-gel 57 to Supreme (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Fibreoptic view	Airway obstruction; aspiration or regurgitation; blood on device; bronchospasm; cough; desaturation; gastric tube placement; trauma to lip, teeth or tongue

Table 1 (*continued*)

Reference	Study details	Allocation i-gel or LMA*	Outcomes	Other outcomes
Uppal et al. [42]	Elective surgery Excluded difficult airway and BMI > 35 kg.m^{-2} Paralysed with rocuronium Crossover study	39 to i-gel 39 to Unique 3, 4 or 5 (13, 20 or 26 ml, i.e. 2/3 recommended volume)	Leak pressure Insertion time Insertion at first attempt	Airway manipulation; gastric insufflation; leak volume and fraction; trauma to mouth
Amini & Khoshfetrat [16]	ASA 1–2, elective peripheral surgery Excluded difficult airway and BMI < 15 or > 30 kg.m^{-2} Paralysed with cisatracurium	60 to i-gel 60 to Solus (maximum recommended volume)	Leak pressure Insertion time Insertion at first attempt Sore throat	Airway manipulation; airway obstruction; bronchospasm; cough; dysphasia; dysphonia; gagging on insertion; gastric insufflation; hiccough
Chew et al. [19]	ASA 1–2, elective surgery Excluded difficult airway and BMI > 35 kg.m^{-2}	45 to i-gel 45 to Supreme (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat Fibreoptic view	Airway manipulation; aspiration; blood on device; bronchospasm; cough; ease of insertion; gagging; hiccough; laryngospasm; S_pO_2 < 95%; trauma to lips or teeth; vomiting
Gasteiger et al. [25]	ASA 1–2, elective gynaecological or orthopaedic surgery Excluded difficult airway and BMI > 35 kg.m^{-2}	75 to i-gel 76 to Proseal (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt	Insertion rate
Helmy et al. [27]	21–60 years, elective surgery < 2 h duration Excluded difficult airway and BMI < 20 or > 25 kg.m^{-2}	40 to i-gel 40 to Classic 3, 4, or 5 (20, 30 or 40 ml, i.e. maximum recommended volume)	Leak pressure Insertion time Insertion at first attempt Sore throat	Blood on device; dysphagia; dysphonia; nausea; neck pain; otalgia; trauma to pharynx, teeth or tongue; vomiting
Sharma et al. [35]	ASA 1–2, elective laparoscopic cholecystectomy Excluded difficult airway and BMI > 35 kg.m^{-2} Paralysed with vecuronium	30 to i-gel 30 to Proseal (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat Fibreoptic view	Dynamic compliance, resistance and work of breathing; minute volume; regurgitation through gastric channel or device
Shin et al. [36]	ASA 1–2, elective orthopaedic surgery Excluded difficult airway and BMI > 35 kg.m^{-2} Paralysed with rocuronium	64 to i-gel 50 to Classic 53 to Proseal	Leak pressure Insertion at first attempt Sore throat	Blood on device; bronchospasm; hoarseness; hypoxia; gastric insufflation; laryngospasm; leak volume; trauma to lips or tongue

Table 1 (*continued*)

Reference	Study details	Allocation i-gel or LMA*	Outcomes	Other outcomes
Siddiqui et al. [37]	ASA 1–2, elective general or orthopaedic surgery Paralysed with atracurium	50 to i-gel 50 to Classic	Insertion at first attempt Sore throat	Dysphagia; dysphonia; ease of insertion
Teoh et al. [40]	ASA 1–2, elective laparoscopic gynaecological surgery Excluded difficult airway and BMI > 40 kg.m^{-2} Paralysed with atracurium	50 to i-gel 50 to Supreme (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat	Airway manipulation; blood on device; dysphagia; dysphonia; ease of insertion
Wadhwa & Kalra [43]	ASA 1–2, varied elective surgery Excluded difficult airway Paralysed with vecuronium	30 to i-gel 30 to intubating LMA	Insertion time Sore throat	Accidental extubation or airway displacement; bronchospasm; ease of insertion; hoarseness; hypoxia; trauma to lips, mouth, teeth or tongue
Ali et al. [15]	ASA 1–2, elective surgery Excluded difficult airway Paralysed with atracurium	30 to i-gel 30 to Supreme (60 cmH_2O)	Leak pressure Insertion at first attempt	Cough; dysphagia; dysphonia; ease of insertion; laryngospasm; trauma
Cattano et al. [17]	ASA 1–2, elective surgery Excluded difficult airway and BMI > 35 kg.m^{-2}	25 to i-gel 25 to Unique	Leak pressure Insertion time Insertion at first attempt Sore throat§ Fibreoptic view§	Blood on device; dysphagia; ease of insertion; hoarseness; other symptoms consistent with injury attributable to the airway device
Donaldson et al. [20]	ASA 1–3, 18–89 years, varied elective surgery	103 to i-gel 98 to AuraOnce	Leak pressure Insertion time Insertion at first attempt Sore throat	Cough; difficulty hearing; dysphagia; dysphonia; hiccough; neck pain; otalgia; nausea; numb tongue; stomatalgia
Weber et al. [44]	ASA 1–3, scheduled trauma surgery < 2 h duration Excluded difficult airway and BMI < 25 or > 35 kg.m^{-2} Crossover study	50 to i-gel 50 to Unique (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt	Airway pressures; aspiration; blood on device; ease of insertion; leak fraction; tidal volume
Eschertzhuber et al. [22]	ASA 1–2, elective surgery Excluded difficult airway and BMI > 35 kg.m^{-2} Paralysed with rocuronium	15 to i-gel 15 to Supreme (60 cmH_2O)	Leak pressure Insertion at first attempt	Blood on device; mucosal pressures
Halwagi et al. [26]	ASA 1–2, elective surgery Excluded difficult airway Paralysed with rocuronium	68 to i-gel 64 to Fastrach	Insertion time Insertion at first attempt	

Table 1 (*continued*)

Reference	Study details	Allocation i-gel or LMA*	Outcomes	Other outcomes
Jeon et al. [30]	ASA 1–2, elective laparoscopic gynaecological surgery Excluded difficult airway and BMI > 35 kg.m^{-2} Paralysed with rocuronium	15 to i-gel 15 to Proseal 3, 4, or 5 (20, 30 or 40 ml)	Leak pressure Insertion time Insertion at first attempt	Airway pressures; flow resistance; leak fraction; lung compliance
Ragazzi et al. [32]	ASA 1–3 women, elective breast surgery Excluded difficult airway and BMI > 35 kg.m^{-2}	35 to i-gel 39 to Supreme 4 or 5 (30 or 40 ml)	Leak pressure Insertion time Insertion at first attempt	Airway manipulations; ease of gastric tube insertion; laryngospasm; pain in larynx or pharynx
Russo et al. [33]	ASA 1–2, elective surgery 1–2 h duration Excluded difficult airway and BMI > 35 kg.m^{-2}	40 to i-gel 40 to Supreme and laryngeal tube (both at 60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat‡	Airway pressure; blood on device; dysphagia; hoarseness; tidal volume
Sastre et al. [34]	ASA 1–3, elective surgery Excluded difficult airway and BMI > 30 kg.m^{-2} Paralysed with rocuronium	40 to i-gel 40 to Fastrach	Insertion at first attempt Fibreoptic view	Dysphonia; trauma to mouth, teeth or tongue; S_pO_2 < 92%
Singh et al. [39]	ASA 1–2, elective surgery for face and neck burn contractures with limited mouth opening Crossover study	48 to i-gel 48 to Classic	Leak pressure† Insertion time† Insertion at first attempt	Airway manipulation; airway obstruction; blood on device; bronchospasm; cough; ease of insertion; hiccough; gagging; gastric insufflation
Van Zundert & Brimacombe [7]	ASA 1–2, elective surgery Excluded difficult airway and BMI > 35 kg.m^{-2}	50 to i-gel 50 to Proseal and Supreme (both to 60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat Fibreoptic view	Blood on device; dysphagia; dysphonia; ease of insertion; regurgitation; trauma to lip, mouth or tongue
Chauhan et al. [18]	ASA 1–2, elective surgery Excluded difficult airway and BMI > 25 kg.m^{-2} Paralysed with rocuronium	40 to i-gel 40 to Proseal (60 cmH_2O)	Leak pressure Insertion time Insertion at first attempt Sore throat Fibreoptic view§	Airway manipulation; blood on device; dysphagia; dysphonia; ease of gastric tube insertion; regurgitation; trauma to lips, teeth or tongue

*Cuff inflation volumes or pressures in brackets.
†Data lacked standard deviations.
‡The rate at 24 h postoperatively was used when the post-anaesthesia care unit rate was not reported.
§These data were presented in a format we were unable to pool with other data.

or simulated difficult airways [39, 41]. The RCTs recruited relatively few participants and were conducted at single centres using different protocols.

There was no difference in leak pressure between the i-gel and LMA, with the I^2 of 92% indicating substantial heterogeneity (Fig. 2). The subgroup analyses indicated lower leak pressures in first-generation LMAs than the i-gel, which in turn was lower than second-generation LMAs, $p < 0.0001$ for a difference between LMA generations, although the respective 89% and 77% I^2 heterogeneities were substantial in both subgroups. There was no interaction between leak pressure and variables explored in any other subgroup or sensitivity analyses. There was no funnel plot asymmetry, $p = 0.48$.

The i-gel reduced mean (95% CI) airway insertion time by 1.46 (0.33–2.60) s compared with the LMA, $p = 0.01$, but with marked heterogeneity, I^2 87% (Fig. 3). The subgroup analysis in Fig. 3 suggested that the i-gel was quicker to insert than first-generation LMAs, but not second-generation LMAs. There was no funnel plot asymmetry, $p = 0.94$.

There was no difference in rate of insertion at first attempt between the i-gel and the LMA, RR 0.98 (0.95–1.01), in 28 RCTs of 2704 participants, $p = 0.13$. There was no funnel plot asymmetry, $p = 0.90$.

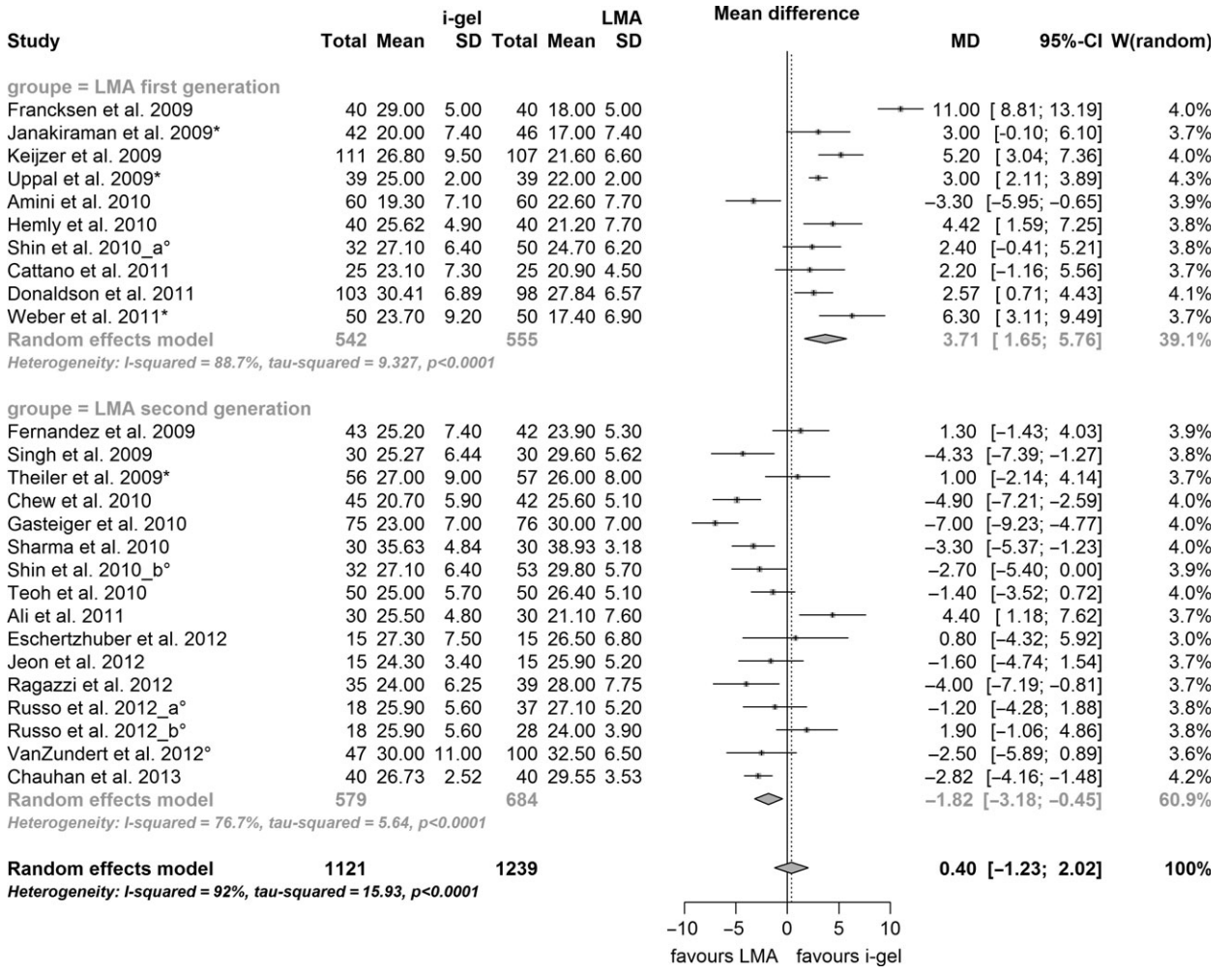

Figure 2 Forest plot of leak pressure around the i-gel vs laryngeal mask airways (LMAs). The pooled total and subgroup estimates are the centre of the solid diamonds, the 95% CI indicated by their width. Units are cmH_2O. *Crossover study. a° and b°, studies with more than two arms.

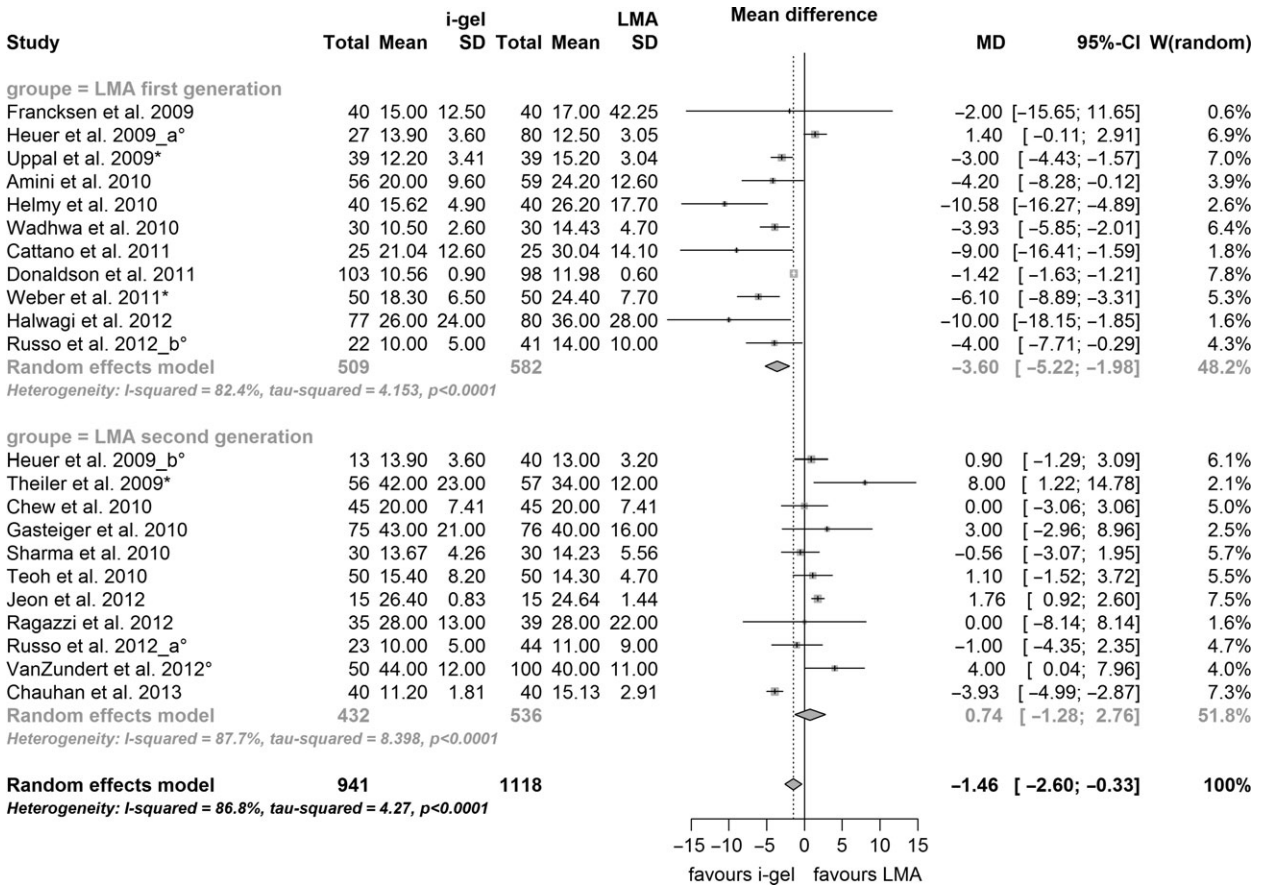

Figure 3 Forest plot of insertion times with the i-gel vs laryngeal mask airways (LMAs). The pooled total and subgroup estimates are the centre of the solid diamonds, the 95% CI indicated by their width. Units are cmH_2O. *Crossover study. a° and b°, studies with more than two arms.

The rate of sore throat was less after i-gel insertion than after LMA insertion, RR 0.59 (0.38–0.90), in 18 RCTs of 2003 participants, p = 0.02. There was no difference in the relative risks of sore throat in the first- vs second-generation LMA subgroup analysis, p = 0.96. There was no funnel plot asymmetry, p = 0.39.

The i-gel decreased the worst category of fibreoptic glottic view compared with the LMA (Fig. 4). There was no funnel plot asymmetry, p = 0.35.

Discussion

This systematic review and meta-analysis of RCTs showed that, compared with the LMA, the i-gel reduced the time for insertion, the rate of postoperative sore throat and the rate of poor fibreoptic view through the airway. Compared with all LMA types, there was no evidence that the i-gel affected leak pressure or rate of insertion on the first attempt.

Substantial heterogeneity in the results triggered subgroup analyses for leak pressure, insertion time and rate of sore throat. Heterogeneity was not reduced by any subgroup analysis, leaving their results unreliable. The faster insertion of the i-gel than first-generation LMAs is probably not clinically relevant. The lower rate of sore throat with the i-gel suggests that LMA cuff pressure might contribute to sore throat. The higher leak pressure with the i-gel than first-generation LMAs might be relevant for laparoscopic procedures [35, 45–47], as might the higher leak pressure in second-generation LMAs, although the difference with the i-gel was less than between first-generation LMAs and the i-gel.

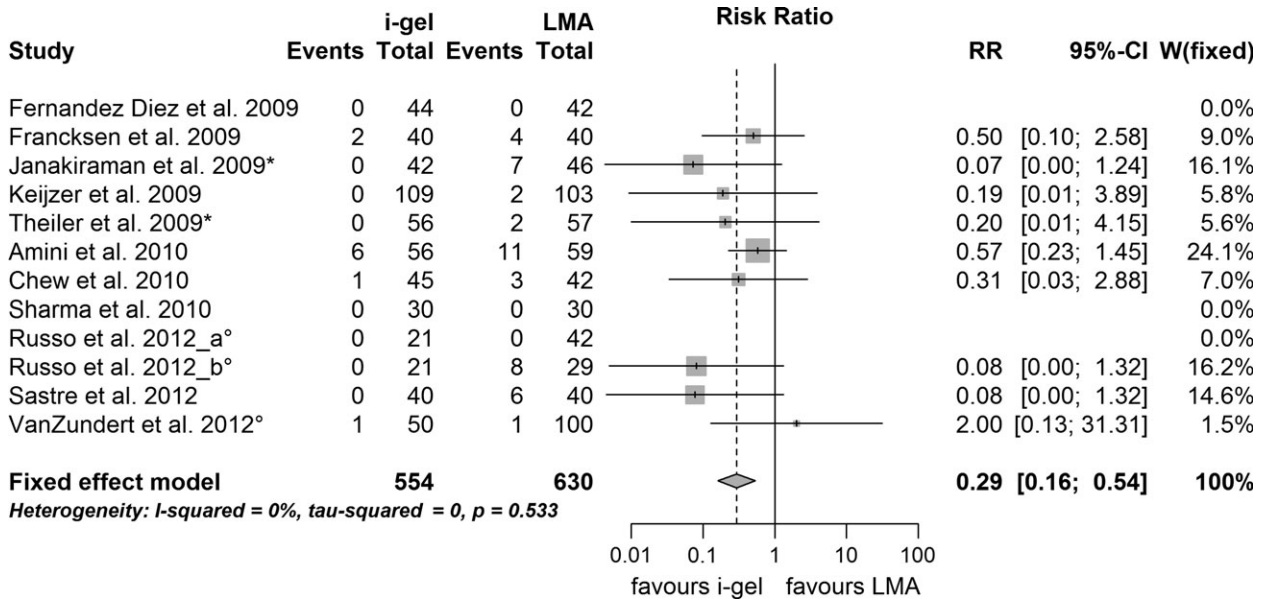

Figure 4 Forest plot of worst fibreoptic view of the glottis through the i-gel vs laryngeal mask airways (LMAs), defined as Brimacombe's class 1, Cook's class 4 and Van Zundert's class 0 or 1. The pooled total and subgroup estimates are the centre of the solid diamonds, the 95% CI indicated by their width. Units are cmH_2O. *Crossover study. a° and b°, studies with more than two arms.

This systematic review had little power to detect a difference in the rates of insertion at first attempt as most devices were inserted first time. Most authors did not describe insertion technique and did not always report LMA cuff pressure, which in many studies was 60 cmH_2O (Table 1): this might have caused sore throat [48–50]. The structure rather than the shape of the i-gel might be the reason that it caused fewer sore throats.

An adequate capnography trace does not correspond with correct positioning and an adequate fibreoptic glottic view does not correlate with correct functioning of the device [7, 51]. Nevertheless, a more frequently poor fibreoptic view through the LMA could impair intubation through the device.

This meta-analysis has some limitations due to the clinical heterogeneity of studies included and to the lack of technical information. As shown in Table 2, it was often difficult or impossible to achieve blind conditions (except for the sore throat criterion). We may have missed studies that were not indexed in the databases we searched, although there was no funnel plot asymmetry that might be caused by publication bias. We were unable to extract from crossover RCTs paired data or data from the first period, which we therefore conservatively analysed as parallel group studies [29, 39, 41, 42, 44]. We did not consider the possibility of carry-over effect for the outcomes of interest other than for sore throat. Most were single-centre studies with few participants, conducted by few investigators. However, we were able to pool 31 RCTs with more than 1000 participants in each arm for most outcomes. Several authors used the same size for the i-gel and the LMA without considering different-sized participants, although a size-4 i-gel is supposed to be suitable for all adults [52].

In conclusion, the main clinical difference was a lower rate of postoperative sore throat with the i-gel, whereas the improved fibreoptic view of the glottis through the i-gel may or may not be clinically significant. The differences between first- and second-generation LMAs identified on subgroup analyses are not proven, but do generate hypotheses that might be tested in further studies.

Competing interests

No external funding and no competing interests declared.

Table 2 Risk of bias assessment for included randomised controlled trials.

			Blinding								
				Assessors							
Study	Sequence generation	Allocation concealment	Patients	Leak pressure	Insertion time	Attempt	Sore throat	Fibreoptic view	Incomplete outcome data	Selective out come reporting	Other source of bias
Elarbi et al. [21]	?	?	?	–	–	?	–	–	?	?	?
Fernandez Diez et al. [23]	?	?	?	?	✓	–	?	?	✓	✓	✓
Francksen et al. [24]	?	✓	?	?	?	?	✓	?	✓	✓	✓
Heuer et al. [28]	?	?	?	–	?	?	?	–	✓	✓	✓
Janakiraman et al. [29]	✓	?	?	–	–	–	–	–	✓	–	✓
Keijzer et al. [31]	✓	✓	✓	–	–	–	✓	–	–	✓	✓
Singh et al. [38]	?	✓	?	?	–	?	–	–	✓	✓	–
Theiler et al. [41]	✓	?	?	–	–	–	–	–	✓	✓	✓
Uppal et al. [42]	?	✓	?	–	–	–	–	–	?	–	✓
Amini & Khoshfetrat [16]	?	✓	?	?	?	?	?	–	✓	✓	✓
Chew et al. [19]	✓	✓	?	?	?	?	✓	?	✓	✓	✓
Gasteiger et al. [25]	?	✓	?	–	✓	–	–	–	✓	–	?
Helmy et al. [27]	?	?	?	–	–	–	–	–	✓	✓	✓
Sharma et al. [35]	✓	?	?	–	–	–	✓	–	✓	✓	?
Shin et al. [36]	?	?	?	–	–	–	–	–	✓	✓	✓
Siddiqui et al. [37]	?	?	?	–	–	?	?	–	✓	✓	?
Teoh et al. [40]	✓	✓	✓	–	–	–	✓	–	✓	✓	✓
Wadhwa & Kalra [43]	✓	✓	?	–	?	–	?	–	✓	✓	?
Ali et al. [15]	?	✓	?	?	–	?	–	–	✓	✓	?
Cattano et al. [17]	✓	✓	?	–	–	–	–	–	✓	✓	✓
Donaldson et al. [20]	✓	?	–	–	–	–		–	✓	✓	✓
Weber et al. [44]	✓	✓	?	–	–	–	–	–	✓	–	?
Eschertzhuber et al. [22]	✓	?	?	✓	–	?	–	–	✓	–	✓
Halwagi et al. [26]	✓	?	?	–	–	–	–	–	✓	✓	✓
Jeon et al. [30]	✓	?	?	–	–	–	–	–	✓	✓	✓
Ragazzi et al. [32]	✓	?	?	–	–	–	–	–	✓	–	✓
Russo et al. [33]	✓	✓	?	–	–	–	–	–	✓	✓	✓
Sastre et al. [34]	?	✓	?	–	–	?	–	?	✓	✓	✓
Singh et al. [39]	?	?	?	?	?	?	–	–	✓	✓	?
Van Zundert & Brimacombe [7]	✓	✓	?	–	–	–	✓	–	✓	✓	✓
Chauhan et al. [18]	✓	✓	?	?	?	?	?	–	✓	✓	✓

✓, low risk of bias; –, high risk of bias; –, indeterminate; ?, unclear risk of bias.

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Appendix

Search strategy

Pubmed: igel[All Fields] OR i-gel[All Fields] NOT igel [au] AND airway[All Fields]

Embase: 'laryngeal mask'/exp AND 'i gel' OR ('laryngeal mask'/exp AND 'device'/exp AND 'i gel')

Cochrane Central Register of Controlled Trials: "i-gel"

Thomson Reuters Web of Knowledge: Topic=(i-gel) OR Topic=(igel) OR Title=(i-gel)

Scirus: "laryngeal mask" AND "i gel" OR ("laryngeal mask" AND "device" AND "i gel")

Virtual Health Library: airway [Words] and device [Words] and laryngeal [Words]