European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 9, Issue 3, Winter 2022

ORIGINAL RESEARCH

A Study to Observe the Hemodynamic Changes Following Insertion of I-gel and to Access Incidence of Any Postoperative Side Effects

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ABSTRACT

Introduction: Supraglottic airway devices (SADs) are used to keep the upper airway open to provide unobstructed ventilation. I-gel is a second generation extraglottic airway device. SADs now provide successful rescue ventilation in > 90% of patients in whom mask ventilation or tracheal intubation is found to be impossible.The present study was carried to observe the hemodynamic changes following insertion of I-gel and to evaluate any incidence of post – operative sore throat or any other side effects.

Material and Methods: A prospective randomized controlled study was conducted on 40 patients scheduled for elective surgical procedures and requiring controlled ventilation. Patients were induced with thiopentone 4-6 mg/kg. Size 3 I-gel was used in patients weighing 30-60 kg and size 4 I-gel was used in patients weighing 60-90 kg. Correct I-gel insertion was assessed clinically by subjective assessment of appropriate length of airway tube outside the mouth, gastric insufflation and adequacy of manual ventilation which was assessed by proper chest expansion and presence of CO_2 waveform.

Results: Slight rise in MAP of 97.58±9.29 mmHg from BL value of 93.13±9.03 was observed (p=0.836). The mean %age rise was 4.66±2.83 after insertion of the I-gel in comparison with the base line value. It was found to be statistically insignificant. Oxygen saturation was maintained between 99-100% for all the patients till the end of the surgery. There was not any significant change in the $ETCO_2$ after I-gel insertion. As revealed from the data there was very less incidence of post-operative complications. Two patients complained of sore throat at 6 hours and 24 hours post-operatively.

Conclusion: I-gel does not cause any significant alteration in the hemodynamic status of the patients, end tidal CO_2 and SPO_2. The incidence of postoperative sore throat is minimal. Hence, we conclude that I-gel can be safely and effectively used for airway management during positive pressure ventilation.

Keywords: Supraglottic airway devices; hemodynamic changes; I-gel.

INTRODUCTION

Supraglottic airway devices (SADs) are used to keep the upper airway open to provide unobstructed ventilation. Early (first-generation) SADs rapidly replaced endotracheal intubation and face masks in > 40% of general anesthesia cases due to their versatility and ease of use. Second-generation devices have further improved efficacy and utility by incorporating design changes.[1] I-gel is a second generation extraglottic airway device.[2]

Individual second-generation SADs have allowed more dependable positive-pressure ventilation, are made of disposable materials, have integrated bite blocks, are better able to act as conduits for tracheal tube placement, and have reduced risk of pulmonary aspiration of gastric contents. SADs now provide successful rescue ventilation in > 90% of patients in whom mask ventilation or tracheal intubation is found to be impossible.[1]

I-gel is a new single-use supraglottic airway device with a non-inflatable cuff. It is composed of a thermoplastic elastomer and a soft gel-like cuff that adapts to the hypopharyngeal anatomy. Like the LMA-ProSeal, it has an airway tube and a gastric drain tube.[3] Its wider and shorter stem suggests that it may be an ideal conduit for intubation using a fibrescope; a size 4 i-gel has a channel length of 192 mm and an internal diameter of 12.3 mm and will accept a 7-mm cuffed tracheal tube (of external diameter 9.5 mm) with enough protrusion beyond the mask to pass the cuff of the tracheal tube into the trachea.[4] The present study was carried to observe the hemodynamic changes following insertion of I-gel and to evaluate any incidence of post – operative sore throat or any other side effects.

MATERIAL AND METHODS

A prospective randomized controlled study was conducted on 40 patients admitted at Heritage Institute of Medical Sciences (HIMS), Bhadwar, Varanasi, Uttar Pradesh (India) scheduled for elective surgical procedures and requiring controlled ventilation. The study was conducted after obtaining approval from research committee of the institution during period 2012-13. Patient inclusion criteria consisted of age 18-60 years, ASA physical status I-II, patient undergoing elective surgical procedures requiring endotracheal intubation for providing anaesthesia and patient with normal airway. Exclusion criteria waspredicted difficult airway, oesophageal reflux disease, BMI >30, history of adverse reaction, surgery more than 4 hours and patient refusal.

A thorough pre-anaesthetic evaluation was done for all patients. Routine haematological, biochemical & radiological investigations appropriate for surgical procedures was done.

Detailed airway assessment was done for all patients using Lemon method. All patients were given diazepam 10mg and ranitidine 150mg orally the night before surgery and at 6a.m with sips of water. After selection and pre-anaesthetic evaluation patients were shifted to operation theatre where in I/V line was set up. All base line parameters were recorded. All necessary monitors were set up for recording SPO_2, Capnography(CO_2), NIBP,HR. Patients received glycopyrrolate (0.01mg/kg), ondansetron 4mg & pentazocine(0.5mg/kg) before induction.

Patients were induced with thiopentone 4-6 mg/kg. Loss of eyelash reflex was accepted as an end point of induction of anaesthesia using thiopentone. After loss of consciousness succinylcholine 1.5mg/kg I/V was given. Size 3 I-gel was used in patients weighing 30-60 kg and size 4 I-gel was used in patients weighing 60-90 kg. The I-gel was held like a pen guided into the pharynx with index finger of the operator at the head of the patient and I-gel operator facing caudally, with head extended and neck flexed. Under direct vision the I-gel was grasped along the integral bite block and was introduced continuously into the mouth towards the hard palate until resistance was felt. Adequate placement of I-gel was assessed by gently squeezing the reservoir bag and observing the end-tidal CO_2 waveform and movement of the chest wall. Gastric tube was inserted through gastric drain outlet.

Correct I-gel insertion was assessed clinically by subjective assessment of appropriate length of airway tube outside the mouth, gastric insufflation and adequacy of manual ventilation which was assessed by proper chest expansion and presence of CO_2 waveform. The presence of gastric insufflation was determined by the epigastric auscultation. Confirmation of the correct placement of the gastric catheter was confirmed by detecting the injected air by auscultation of the epigastrium and aspiration of the gastric contents.

After introducing I-gel, anaesthesia was maintained with 67%N_20, 33%O_2, halothane,

intravenous analgesic & muscle relaxant. Monitoring of HR, SBP, DBP, MAP, SPO_2, $ETCO_2$ was done before drug administration, immediately after induction, 1min, 3min, 5min, 10min, 15min, 20min, 25min, 30min then after every five minutes till the end of surgery. At the end of surgery neostigmine 0.05mg/kg I/V + glycopyrrolate 0.02mg/kg was administered for reversal of residual muscle relaxation and I-gel was taken out. HR, SBP, DBP, MAP,SPO_2 was recorded prior to induction/baseline, immediately after induction, I-gel insertion, at 1min, 3min, 5min, 10min, 15min ,20min, 25min and 30min of surgery. End tidal CO_2 monitoring was done.

Table 1: Variation of heart rate (bpm) values among the patients

	HR		
	Mean	**SD**	**p-value**
HR (BL)	84.93	9.87	0.059
HR(IAI)	89.18	9.60	
HR - 1 Min.	88.05	10.22	
HR - 3 Min.	85.70	10.75	
HR - 5 Min.	82.35	10.50	
HR - 10 Min.	80.58	9.81	
HR - 15 Min.	79.33	9.42	
HR - 20 Min.	80.90	5.50	
HR - 25 Min.	77.83	5.65	
HR - 30 Min.	76.15	4.32	

Table 2: Comparison of the means of percentage change in the heart rate compared to the baseline value

	Mean	**SD**	**p-value**
Mean %age change in HR from BL to (IAI)	4.88	2.77	0.067
Mean %age change in HR from BL to 1 Min.	3.60	3.48	
Mean %age change in HR from BL to 3 Min.	0.90	8.53	
Mean %age change in HR from BL to 5 Min.	-3.08	6.18	
Mean %age change in HR from BL to 10 Min.	-5.25	0.60	
Mean %age change in HR from BL to 15 Min.	-6.81	4.66	
Mean %age change in HR from BL to 20 Min.	-4.86	56.86	
Mean %age change in HR from BL to 25 Min.	-8.72	54.38	
Mean %age change in HR from BL to 30 Min.	-10.90	78.22	

Table 3: Variation of systolic blood pressure (mmHg) values

	SBP		
	Mean	**SD**	**p-value**
SBP (BL)	121.73	9.80	0.052
SBP(IAI)	127.15	10.82	
SBP - 1 Min.	124.88	10.99	
SBP - 3 Min.	119.25	9.72	
SBP - 5 Min.	116.30	10.32	
SBP - 10 Min.	114.53	10.64	
SBP- 15 Min.	113.33	10.39	
SBP - 20 Min.	112.05	5.52	
SBP - 25 Min.	111.80	5.59	
SBP - 30 Min.	113.85	4.88	

Table 4: Comparison of the means of percentage change in the SBP compared to the baseline value

	Mean	SD	P-value
Mean %age change in SBP from BL to (IAI)	4.35	9.89	0.077
Mean %age change in SBP from BL to 1 Min.	2.55	11.44	
Mean %age change in SBP from BL to 3 Min.	-2.05	0.81	
Mean %age change in SBP from BL to 5 Min.	-4.56	5.16	
Mean %age change in SBP from BL to 10 Min.	-6.09	8.21	
Mean %age change in SBP from BL to 15 Min.	-7.14	5.84	
Mean %age change in SBP from BL to 20 Min.	-8.28	55.87	
Mean %age change in SBP from BL to 25 Min.	-8.50	54.71	
Mean %age change in SBP from BLto 30 Min.	-6.68	67.03	

Table 5: Variation of diastolic blood pressure (mmHg) values amongthe patients

	DBP		
	Mean	**SD**	**p-value**
DBP (BL)	79.38	9.67	0.394
DBP(IAI)	82.70	9.52	
DBP - 1 Min.	82.33	9.36	
DBP - 3 Min.	77.03	8.63	
DBP - 5 Min.	75.25	8.94	
DBP - 10 Min.	73.78	8.34	
DBP- 15 Min.	72.50	8.79	
DBP - 20 Min.	80.45	4.01	
DBP - 25 Min.	88.52	2.02	
DBP - 30 Min.	85.67	3.09	

Table 6: Comparison of the means of percentage change in the DBP compared to the baseline value

	Mean	SD	P-value
Mean %age change in DBP from BL to (IAI)	4.09	1.56	0.532
Mean %age change in DBP from BL to 1 Min.	3.64	3.25	
Mean %age change in DBP from BL to 3 Min.	-3.00	11.36	
Mean %age change in DBP from BL to 5 Min.	-5.34	7.84	
Mean %age change in DBP from BL to 10 Min.	-7.31	14.76	
Mean %age change in DBP from BL to 15 Min.	-9.05	9.53	
Mean %age change in DBP from BL to 20 Min.	1.33	82.74	
Mean %age change in DBP from BL to 25 Min.	10.88	130.88	
Mean %age change in DBP from BL to 30 Min.	7.62	103.13	

Table 7: Variation of mean arterial pressure (mmHg) values among the patients

	MAP		
	Mean	**SD**	**p-value**
MAP (BL)	93.13	9.03	0.836
MAP (IAI)	97.58	9.29	
MAP - 1 Min.	96.50	9.37	
MAP - 3 Min.	91.08	8.46	
MAP - 5 Min.	88.93	8.82	

MAP - 10 Min.	87.35	8.52	
MAP - 15 Min.	86.10	8.85	
MAP - 20 Min.	90.90	3.41	
MAP - 25 Min.	96.27	2.34	
MAP - 30 Min.	94.97	2.85	

Table 8: Comparison of the means of percentage change in the MAP compared to the baseline value

	Mean	**SD**	**P-value**
Mean %age change in MAP from BL to IAI	4.66	2.83	0.059
Mean %age change in MAP from BL to 1 Min.	3.55	3.69	
Mean %age change in MAP from BL to 3 Min.	-2.22	6.51	
Mean %age change in MAP from BL to 5 Min.	-4.61	2.35	
Mean %age change in MAP from BL to 10 Min.	-6.40	5.81	
Mean %age change in MAP from BL to 15 Min.	-7.84	2.01	
Mean %age change in MAP from BL to 20 Min.	-2.42	90.35	
Mean %age change in MAP from BL to 25 Min.	3.31	117.68	
Mean %age change in MAP from BL to 30 Min.	1.95	104.04	

Table 9: SPO_2

SPO_2	**SPO_2**	**p-value**
99%	8	0.871
	20.0%	
100%	32	
	80.0%	
Total	40	
	100.0%	

Table 10: $ETCO_2$

	$ETCO_2$		
	Mean	**SD**	**p-value**
$ETCO_2$BL	39.82	2.17	0.536
$ETCO_2$IAI	41.52	1.31	
$ETCO_2$1M	41.80	1.13	
$ETCO_2$3M	41.84	0.92	
$ETCO_2$5M	42.52	0.54	
$ETCO_2$10M	42.53	0.54	
$ETCO_2$15M	42.19	0.80	
$ETCO_2$20M	42.52	0.80	
$ETCO_2$25M	42.19	0.80	
$ETCO_2$30M	43.62	0.82	

Table 11: Comparison of the means of percentage change in the $ETCO_2$ compared to the baseline value

	Mean	**SD**	**P-value**
Mean %age change in $ETCO_2$ from BL to (IAI)	4.18	49.42	
Mean %age change in $ETCO_2$ from BL to 1 Min.	4.85	63.03	
Mean %age change in $ETCO_2$ from BL to 3 Min.	4.94	80.90	

Mean %age change in $ETCO_2$ from BL to 5 Min.	6.55	120.29	0.062
Mean %age change in $ETCO_2$ from BL to 10 Min.	6.58	120.29	
Mean %age change in $ETCO_2$ from BL to 15 Min.	5.78	92.26	
Mean %age change in $ETCO_2$ from BL to 20 Min.	6.55	92.26	
Mean %age change in $ETCO_2$ from BL to 25 Min.	5.78	92.26	
Mean %age change in $ETCO_2$ from BL to 30 Min.	9.10	90.30	

Table 12: Postoperative Complaint

Postoperative Complaint					
	1 hr	**6 hrs**	**12 hrs**	**24 hrs**	**48 hrs**
Sore throat	0	1	0	1	0
Dysphagia	0	0	0	0	0
Dysphonia	0	0	0	0	0
Neck Pain	0	0	0	0	0
Numb Tongue	0	0	0	0	0
Hoarseness of voice	0	0	0	0	0
Other complaints	0	0	0	0	0

RESULTS

The mean baseline HR was 84.93±9.87, the mean HR(IAI) was 89.18±9.80, the mean HR-1 min was 89.05±10.22, the mean HR-3 min was 85.70±10.75, the mean HR-5 min was 82.35±10.50, the mean HR-10 min 80.58±9.81, the mean HR-15 min was 79.33±9.42, the mean HR-20 min was 80.90±5.50, the mean HR-25 min was 77.83±5.65 ,the HR-30 min was 76.15±4.32. The p value was 0.059(p >0.05) which is statistically insignificant (table 1).

The mean %age change in HR from BL immediate after insertion of the I-gel was 4.88±2.77, after 1 min was 3.60±3.48, after 3 min was 0.90±8.53, after 5 min -3.08±6.18, after 10 min was -5.25±0.60, after 15 min was -6.18±4.66, after 20 min was -4.86±56.86, after 25 min was -8.72±54.38, after 30 min was -10.90±78.22. The p value was 0.067(p>0.05) which is statistically insignificant (table 2).

The mean base line SBP was 121.73±9.80, the mean SBP (IAI) was 127.15±10.82, the mean SBP at 1 min was 124.88±10.99, the mean SBP at 3 min was 119.25±9.72, the mean SBP at 5 min was 116.30±10.32, the mean SBP at 10 min was 114.53±10.64, the mean SBP at 15 min was 113.33±10.39, the mean SBP at 20 min was 112.05±5.52, the mean SBP at 25 min was 111.80±5.59, the mean SBP at 30 min was 113.85±4.88. The p value was 0.052 (p value >0.05) which is statistically insignificant (table 3).

The mean %age change in SBP from BL immediate after insertion of the I-gel was 4.35±9.89, after 1 min was 2.55±11.44, after 3 min was -2.05±0.81, after 5 min was -4.56±5.16, after 10 min was -6.09±8.21, after 15 min was -7.14±5.84, after 20 min was -8.28±55.87, after 25 min was -8.50±54.71, after 30 min was -6.68±67.03. The p value was 0.077(p>0.05) which is statistically insignificant (table 4).

The mean base line DBP was 79.38±9.67, the mean DBP (IAI) was 82.70±9.52, the mean DBP at 1min was 82.33±9.36, the mean DBP at 3 min was 77.03±8.63, the mean DBP at 5 min was 75.25±8.94, the mean DBP at 10 min was 73.78±8.34, the mean DBP at 15 min was 72.50±8.79, the mean DBP at 20 min was 80.45±4.01, the mean DBP at 25 min was 88.52±2.02, the mean DBP at 30 min was 85±3.09. The p value was 0.394(p value >0.05) which is statistically insignificant (table 5).

The mean %age change in DBP from BL immediate after insertion was 4.09±1.56, after 1 min was 3.64±3.25, after 5 min was -3.00±11.36, after 10 min was -7.31±14.76, after 15 min

was -9.05±9.53, after 20 min was 1.33±82.74, after 25 min was 10.88±130.88, after 30 min was 7.62±103.13. The p value was 0.532(p>0.05) which is statistically insignificant (table 6).
The mean base line MAP was 93.13±9.03, the mean MAP (IAI) was 97.58±9.29, the mean MAP at 1 min was 96.50±9.37, the mean MAP at 3 min was 91.08±8.46, the mean MAP at 5 min was 88.93±8.82, the mean MAP at 10 min was 87.35±8.52, the mean MAP at 15 min was 86.10±8.85, the mean MAP at 20 min was 90.90±3.41, the mean MAP at 25 min was 96.27±2.34, the mean MAP at 30 min was 94.97±2.85. The p value was 0.836 (p value > 0.05) which is statistically insignificant (table 7).
The mean %age change in MAP from BL immediate after insertion was 4.66±2.83, after 1 min was 3.55±3.69, after 3 min was -2.22±6.51, after 5 min was -4.61±2.35, after 10 min was -6.40±5.81, after 15 min was -7.84±2.01, after 20 min was -2.42±90.35, after 25 min was 3.31±117.68, after 30 min was 1.95±104.04. The p value was 0.059(p>0.05) which is statistically insignificant (table 8).
8 (20%) patients had 99% saturation and 32(80%) patients had 100% saturation from start till the end of the surgery. The p value was 0.871(p value >0.05) which is statistically insignificant (table 9).
The mean base line $ETCO_2$ was 39.82±2.17, the mean $ETCO_2$ (IAI) was 41.52±1.31, the mean $ETCO_2$ at 1 min was 41.80±1.13, the mean $ETCO_2$ at 3 min was 41.84±0.92, the mean $ETCO_2$ at 5 min was 42.52±0.54, the mean $ETCO_2$ at 10 min was 42.53±0.54, the mean $ETCO_2$ at 15 min was 42.19±0.80, the mean $ETCO_2$ at 20 min was 42.52±0.80, the mean $ETCO_2$ at 25 min was 42.19±0.80, the mean $ETCO_2$ at 30 min was 43.62±0.82. Their p value was 0.536 (p >0.05) which is statistically insignificant (table 10).
The mean %age change in $ETCO_2$ immediate after insertion of I-gel was 4.18±49.42, after 1 min was 4.85±63.03, after 3 min was 4.94±80.90, after 5 min was 6.55±120.29, after 10 min was 6.58±120.29, after 15 min was 5.78±92.26, after 20 min was 6.55±92.26, after 25 min was 5.78±92.26, after 30 min was 9.10±90.30. The p value was 0.062(p>0.05) which is statistically insignificant (table 11).
The post operative complaints (sore throat, dysphagia, dysphonia, neck pain, numb tongue) were assessed at 1 hour, 6 hour, 12 hour, 24 hour and 48 hours after the surgery. One patient at 6 hour and one patient at 24 hour complained of sore throat (table 12).

DISCUSSION

The present study evaluated the hemodynamic changes following insertion of I-gel and to evaluate any incidence of post – operative sore throat or any other side effects. The analysis of our observational data reveals rise in H.R. to 89.18±9.60bpm from base line values of 84.93±9.87bpm (which lasted for 15-30 sec) (p=0.059). Also, the mean %age rise in the HR immediate after insertion of the device was 4.88±2.77 from base line value. It was found to be insignificant statistically.Helmy AM et al[5] in his study found that I-gel do not cause any significant alteration in the H.R. of the patients.Jindal P et al[6] observed in his study that the hemodynamic changes were least in the I-gel group.Present study is comparable with the above mentioned studied where also there was not any significant alteration in the H.R.
In our study we found that there was a slight rise in mean SBP after insertion of the I-gel. The maximum rise in mean SBP was noted just after airways manipulation. The mean SBP after I-gel insertion was 127.15±10.82 mmHg as compared to mean baseline value of 121.73±9.80 mmHg (p=0.052). Also, the mean %age rise in SBP after insertion was 4.35±9.89 from the base line value. It was found to be insignificant statistically.Helmy AM et al[5] in his study found that I-gel does not cause any significant alteration in the systolic BP of the patients.Jindal P et al[6] observed in his study that the hemodynamic changes were least in the I-gel group.Present study is comparable with above mentioned studies where also there was not any significant alteration in the SBP of the patients.

From our study we found there was a slight rise in mean DBP after insertion of the device. The mean DBP rose to 82.70±9.52 mmHg from the baseline value of 79.38±9.67 mmHg after insertion of the I-gel (p=0.394). Also, the mean % rise in DBP from the base line value was 4.09±1.56. It was found to be insignificant statistically. Subsequently after some time there was decline in DBP as compared to the baseline. This mild decrease in DBP below baseline level was attributed to the use of halothane and vecuronium both of which are known to cause a fall in BP, but the fall was not significant statistically.

Helmy AM et al[5] found that I-gel does not cause any significant alteration in the diastolic BP of the patients. Jindal P et al[6] observed in his study that the hemodynamic changes were least in the I-gel group.Present study is comparable with the above-mentioned studies where also there was not any significant alteration in the hemodynamic status of the patients.

As evident from the results, we found slight rise in MAP from baseline values reaching its peak in 15 to 30 sec after I-gel insertion. The MAP rose to 97.58±9.29 mmHg from the baseline value of 93.13±9.03 mmHg after insertion (p=0.836). Also, the mean %age rise in MAP from the base line value was 4.66±2.83 after insertion of the I-gel which was insignificant statistically. Helmy AM et al[5] found that I-gel do not cause any significant alteration in the MAP of the patients.Jindal P et al[(32)] observed in his study that the hemodynamic changes were least in the I-gel group.The present study is comparable with the above-mentioned studies where also there was not any significant alteration in the MAP of the patients.

In the present study there was not any significant change in the $ETCO_2$ after I-gel insertion. Our results also corroborates with Helmy AM et al[5] who carried out a prospective randomized clinical trial to compare I-gel and C-LMA among 80 patients undergoing different surgical procedures under general anaesthesia with spontaneous ventilation. It was concluded that both I-gel and C-LMA did not cause any significant alterations in the hemodynamic status of the patients, $ETCO_2$ and SPO_2. The postoperative complications were not significantly different except nausea and vomiting which was statistically higher in C-LMA group (p=0.032). Insertion of the I-gel was significantly easier and more rapid than insertion of C-LMA. In a study carried by Dumont L et al,[7] in patients undergoing laparoscopic gastroplasty, ventilator adjustments were performed by increasing the respiratory rate by 25% and minute ventilation by 21% to counteract the increase in carbon dioxide load and prevent intraoperative acidosis.

In the study done by Richez B et al[8]found $ETCO_2$ 36 ± 4 mm Hg after I-gel insertion which is comparable with our study.Lu et al[9] who compared proseal LMA with ETT and CLMA respectively. $EtCO_2$ were comparable in both groups. During carboperitoneum minute ventilation was increased mainly by increasing the respiratory rate rather than tidal volume. This was done to eliminate raised carbon dioxide load and prevent systemic acidosis.

The postoperative complaints (sore throat, dysphagia, dysphonia, neck pain, numb tongue or other complaints) were assessed in 1 hour, 6 hours, 12 hours, 24 hours and 48 hours after the surgery. Only two patients complained of sore throat after 6 hours and after 24 hours postoperatively. Getward JJ et al[10] also found that the incidence of complications with the I-gel was generally low, being seen in less than 10% of the patients. Side effects were mostly restricted to sore throat. 18% patients developed sore throat or pain on swallowing which persisted until 24hrs in eleven patients(11%).Keijzer Cet al[11]in their study found that incidence of sore throat was significantly lower with I-gel than LM at 1(6 vs 32), 24(7 vs 48) and 48(5 vs 25). Our results are comparable with above mentioned studies where only two patients complained of sore throat after 6 hour and 24-hour post operatively.

CONCLUSION

I-gel does not cause any significant alteration in the hemodynamic status of the patients, end tidal CO_2 and SPO_2. The incidence of postoperative sore throat is minimal. Hence, we conclude that I-gel can be safely and effectively used for airway management during positive pressure ventilation.

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