Original Research Article

A Comparative study of I-gel for general anesthesia in obese and non-obese patients at tertiary health care centre

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Abstract

Background: The I-gel supraglottic airway device (Intersurgical Ltd, Wokingham, Berkshire, UK) was developed in 2007 to overcome the limitations of Proseal laryngeal mask airway (PLMA) **Aims and Objectives:** To study I-gel for general anesthesia in obese and non-obese patients at tertiary health care centre. **Methodology:** This was cross-sectional study carried out in the department of anesthesiology the one year period during January 2017 to January 2018; in one year period there were 30 non obese individuals and 30 obese individuals were enrolled to study after a written explained consent. All the patients undergone i-gel insertion for General anesthesia. OLP in the patients was measured by closing the adjustable pressure limiting valve of the circle breathing system and noting the pressure at which leak developed (detected by a stethoscope placed just lateral to thyroid cartilage) at fresh gas flow of 3 L/min. The statistical analysis was done by chi-square test and analyzed by SPSS 19 version software. **Result:** In our study we have seen that The parameters were comparable with each other especially like OLP (CM of H2O)- 26.78 ±3.92 And 28.45 ± 4.56 ($p>0.05$); LF - 7.91 ± 3.45 and 8.98 ± 3.54 ($p>0.05$); Time to insert i-gel (s) 15.45 ± 5.86 and 18.1 ± 4.56 ($p>0.05$) . The grade of ease of insertion was more in Obese individuals was more as compared to non-obese individuals this was statistically significant ($X2=7.36, df=2, p<0.02$) .The no. of attempts were more in Obese individuals as compared to non obese individuals this was statistically significant ($X2=6.955, df=2, p<0.03$) **Conclusion:** It can be concluded from our study that i-gel insertion was comparable with obese and non-obese individuals except to ease of insertion and no. of attempts required more .

Key Word: I-gel, General anesthesia, Obesity, Orophyrengeal Leak pressure (OLP), Leak Fraction (LF).

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INTRODUCTION

The I-gel supraglottic airway device (Intersurgical Ltd, Wokingham, Berkshire, UK) was developed in 2007 to overcome the limitations of Proseal laryngeal mask airway (PLMA). It is made up of a thermoplastic elastomer (SEBS - styrene ethylene butadiene styrene) with a soft durometer (hardness), which has a gel-like feel.[1] It was designed to create a non-inflatable, anatomical seal of the pharyngeal, laryngeal and perilaryngeal structures while avoiding compression trauma. The shape, softness and contour accurately mirror the perilaryngeal anatomy to create the perfect fit, so that compression and displacement trauma are significantly reduced and has cheaper manufacturing costs due to the simplicity of design.[2,3] In our study We have compared I-gel for general anesthesia in obese and non-obese patients at tertiary health care centre.

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METHODOLOGY

This was cross-sectional study carried out in the department of anesthesiology the one year period during January 2017 to January 2018; in one year period there were 30 non obese individuals and 30 obese individuals were enrolled to study after a written explained consent. All the patients undergone i-gel insertion for General anesthesia. OLP in the patients was measured by closing the adjustable pressure limiting valve of the circle breathing system and noting the pressure at which leak developed (detected by a stethoscope placed just lateral to thyroid cartilage) at fresh gas flow of 3 L/min. A maximum airway pressure of 40 cm H_2O was allowed during the test. The best view of larynx obtained with fiberoptic bronchoscope (recorded as fiberoptic view [FOV]) inserted through the airway tube of i-gel was graded and recorded as: (1) full view of glottis obtained;[2] glottis visible partially;[3] glottis not visible but only epiglottis visible; and (4) no recognizable laryngeal structures visible. Leak fraction (LF) was recorded and defined as the difference between inspiratory and expiratory tidal volumes and divided by inspiratory tidal volume. The statistical analysis was done by chi-square test and analyzed by SPSS 19 version software.

RESULT

Table 1: Distribution as per the Orophyrengeal Leak pressure and time for i-gel insertion

Parameters	Non-Obese (n=30)	Obese (n=30)	p-value
OLP (CM of H_2O)	26.78 ±3.92	28.45 ± 4.56	p>0.05
LF	7.91 ± 3.45	8.98 ± 3.54	p>0.05
Time to insert i-gel (s)	15.45 ± 5.86	18.1 ± 4.56	p>0.05

The parameters were comparable with each other especially like OLP (CM of H_2O)- 26.78 ±3.92 And 28.45 ± 4.56 (p>0.05); LF -7.91 ±3.45 and 8.98 ± 3.54 (p>0.05); Time to insert i-gel (s) 15.45 ± 5.86 and 18.1 ± 4.56 (p>0.05) .

Table2: Distribution of the patients as per the ease of insertion

Grade	Non-Obese (n=30)	Obese (n=30)
1	**19**	**9**
2	**7**	**10**
3	**4**	**11**

(X^2=7.36,df=2,p<0.02)

The grade of ease of insertion was more in Obese individuals was more as compared to non-obese individuals this was statistically significant (X^2=7.36,df=2,p<0.02)

Table 3: Distribution of the patients as per the no. of attempts

No. Attempts	Non-Obese (n=30)	Obese (n=30)
1	21	12
2	9	15
3	0	3

(X^2=6.955,df=2,p<0.03)

The no. of attempts were more in Obese individuals as compared to non obese individuals this was statistically significant (X^2=6.955,df=2,p<0.03)

DISCUSSION

Supraglottic airway devices are routinely used for short-term elective surgery, and have shown to be safe and effective in spontaneously breathing patients and in patients undergoing pressure-controlled ventilation[4,7]. Recently, the i-gel (Intersurgical Ltd, Wokingham, Berkshire, UK), a novel supraglottic airway device, has been introduced into clinical routine anaesthesia. The i-gel has a non-inflatable, gel-like cuff, that is made of a thermoplastic elastomer (styrene ethylene butadyiene styrene) and is claimed to conform and fit to the perilaryngeal anatomy, providing a reliable perilaryngeal seal. This enables easier positioning and insertion and a better seal compared with laryngeal mask airways (LMAs) with inflatable cuffs[5,8,14]. The i-gel incorporates a drainage tube to prevent gastric inflation, that allows insertion of a gastric tube. A recent study also confirms its use for rescue intubation[14]. There have already been several studies comparing the i-gel with other supraglottic airway devices (LMAUnique (IntaventOrthofix, Maidenhead, Berkshire, UK), classic LMA) in lean patients. These studies show that the i-gel may be used with higher ventilation pressures due to its better seal compared with other supraglottic airway devices[5,6,10]. U. Weber[16] speculated that this technical feature may be especially beneficial in patients with mild to moderate obesity during shortterm elective surgery, when supraglottic airway devices are frequently used, and

where an optimal fit of the airway device and high leakage pressures are important. The LMA-Unique is one of the most widely used supraglottic airway devices in clinical routine In our study we have seen that The parameters were comparable with each other especially like OLP (CM of H_2O)- 26.78 ±3.92 And 28.45 ± 4.56 ($p>0.05$); LF-7.91±3.45 and 8.98 ± 3.54 ($p>0.05$); Time to insert i-gel (s) 15.45 ± 5.86 and 18.1 ± 4.56 ($p>0.05$) . The grade of ease of insertion was more in Obese individuals was more as compared to non-obese individuals this was statistically significant ($X^2=7.36,df=2,p<0.02$) .The no. of attempts were more in Obese individuals as compared to non obese individuals this was statistically significant ($X^2=6.955,df=2,p<0.03$) The study by Rati Prabha [15] *et al* they found OLP was slightly higher in Group O (25.38 ± 4.79 cm H_2O) but was not statistically different than Group C (27.38 ± 4.38 cm H_2O). Other parameters except weight and BMI (which were higher in Group O) were statistically similar in both groups. There was no statistical difference in side effects. In our study the parameters like Ease of insertion and no attempts differed significantly it may be due different setup, expertization of insertions of prevalence of obesity different in our study group as compared their study group

CONCLUSION

It can be concluded from our study that i-gel insertion was comparable with obese and non-obese individuals except to ease of insertion and no. of attempts required more.

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