DOI: https://doi.org/10.53350/pjmhs2115123232

ORIGINAL ARTICLE

To Compare the Frequency of Postoperative Sore Throat with I-Gel Versus Laryngeal Mask Airway in patients undergoing General Surgery under General Anesthesia

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ABSTRACT

Background: In case of general anesthesia, airway maintenance along with least complications is the most important goal of team of anesthesiologists. In case of clinical practice, the laryngeal mask airway (LMA) devices have superiority in managing supraglottic airway. Recently i-gel airway has been introduced as supraglottic airway equipment (disposable).
Aim: To make comparison between laryngeal mask and I-gel with respect to postoperative complication of sore throat in case of patients who were given general anesthesia.
Study design: Randomized trial
Setting: Anesthesia Department
Study duration: 6 after synopsis approval in total 6months of duration
Methods: Candidates were divided randomly divided into two groups. In case of members of group A, patients were given i-gel where as members of group B, disposable LMA was given. General anesthesia was administered according to the standardized protocols. A day after operation, candidates were check post operatively for 24 hours, for sore throat and information was documented on Performa.
Results: The candidates mean age was 44.23±15.11years in case of i-gel group members whereas 46.10±15.56 years in case of LMA group. In case of i-gel group, there were about twenty five males members and thirty five were females members . In case of LMA group members, there were about twenty six males and thirty four female members . In present case research, sore throat postoperatively was seen in case of 17(14.2%) cases, i.e. 4 (6.7%) in i-gel group while 13(21.7%) in case of LMA group. The significant difference was witnessed between members of both groups ($p<0.05$).
Conclusion: Thus i-gel is better than LMA for general anesthesia as it has fewer chances of side effects like postoperative sore throat.
Keywords: Postoperative sore throat, I-gel, laryngeal mask airway, general anesthesia

INTRODUCTION

In case of general anesthesia, air way Maintenance along with least complications is the most important goal of team of anesthesiologists.. The standardized protocol in any surgery make use of Endotracheal intubation but few complications are linked with it such as injury to teeth lips, tongue, epiglottis, trachea, larynx sore and throat are commonly seen side effects since it needs laryngoscopy as well as vocal cords manipulations[1.]
In case of routine, Supraglottic airway devices have shown most suitable case of anesthesia as well as air way procedures that are carried in emergency[2]. In case of supraglottic airway management, the laryngeal mask airway (LMA) devices have superiority and have been used commonly in routine clinical procedures[3].

In order to overcome risk due to contamination, the disposable variety is preferred. Recently, I-gel, new supraglottic airway device in disposable form has come into existence[3]. As compared to LMA, i-gel airway is a good and alternative option to soft disposable seal due to the fact that it is easy to inset as well as it depicts less complication linked with sore throat postoperatively[3].

The I-gel is SGA composed, single gel like soft, non-inflatable cuff that is composed of a elastomer made of thermoplastic. It consist of flattened broad, stem with hard bite block that serves as stabilizer bucally in order to deduce rotation axial as well as mal-positioning, and also a slot for insertion of gastric tube. It is a instrument that is free of latex and does not need insertion digitally into the mouth of patient Moreover, it is cheaper as compared to other SGAs[4].

Received on 17-06-2021
Accepted on 24-11-2021

The LMA-P has drain tube and passes via mask bowl. it is an inflatable device[4]. The increased bulk as well as the inflatable cuff posteriorly of LMA-P increases the pharyngeal seal substantially[5] to the bigger LMA-P tip and missing of a back-plate on the instrument, inexperienced insertion might cause folding of device posteriorly. For inserting LMA-P, three techniques have been utilized namely bougie-guided , standard and introducer[6].
In case of randomized trial, it was seen that sore throat postoperatively was witnessed in case of 3.3% candidates using I-gel where as in case of LMA, 16.7% was witnessed . The difference observed Statistically was not significant ($p=0.085$).[7]
Another case research also depicted similar results and documented sore throat in 37.5% of candidates using I-gel and same value goes for patients using LMA. The difference Statistically was not significant ($p=0.34$)[8].

As per one case research sore throat postoperatively was seen in 1.7% individuals who used I-gel and same results were obtained for individuals who used LMA. There was insignificant ($p=0.752$)[9] difference. but one case research depicted that sore throat postoperatively was seen in case of 3.4% individuals who belonged to I-gel group where as 28.6% in case of individuals belonging to LMA group. There was significant ($p<0.05$) difference was observed. Moreover, sore throat as well as dysphagia had been observed in case of LMA group as compared to members of I-Gel group .It is therefore recommended to use I-gel mask[10].

The aim of this case research is to make comparison between sore throat postoperatively with I-gel administered versus individuals where LMA was administered in case of individuals undergoing surgical procedure specially under general anesthesia. With respect to past researches, both devices depicted equal effectiveness in case of sore throat post-operatively. But many disputes existed with respect to effectiveness of I-gel in case of

less incidences of sore throat when compared with LMA. Furthermore , there is in availability of local magnitude which can aid us in implementation of usage of more profitable overcome in sore throat prevention postoperatively in future, in order to make it as standardized protocol in hospitals .

This study was carried out to compare classical laryngeal mask airway (LMA) and i-gel during general anesthesia.

Operational Definitions

Postoperative sore throat: It was estimated after 2 hours of operation by assessment of pain based on rating scale verbally . A rating measuring ≥4/10 was taken as sore throat postoperatively.

Hypothesis: There is difference with respect to frequency in case of sore throat postoperatively in case of individuals belonging to I-gel group versus in individuals belonging to laryngeal mask airway after undergoing general anesthesia.

MATERIAL AND MATHODS

About 120 candidates were taken as the sample size in such a way 60 individuals in each group and estimated with 80% power of test, 5% significance level and by expecting percentage of sore throat postoperatively i.e. 3.4% in case of individuals belonging to I-gel group whereas 28.6% in case of individuals belonging to LMAgroup who were undergoing surgery in general anesthesia. Sampling Technique used was consecutive sampling, Non-probability sampling.

Inclusion criteria:

- Age lies between 20 to 70 years
- Both gender
- Weight ranging from 30 to 100kg
- Surgeryies such as thyroid, hernia , cholecystectomy, mastectomy with 6 hours of fasting for general anesthesia.

Exclusion criteria:

1. Candidates with ASA status III or IV (Appendix-I)
2. Surgical procedure greater than 90minutes
3. Predicted airway difficult like mallampati score greater than 2, inter-incisor distance less than 3cm, BMI greater than 35kg/m^2, required in surgery in case of position nonsupine, undergoing nasal or oral operation
4. Preoperative sore throat history
5. Edentulous candidate Completely

Data Collection Procedure: After approval from ethical committee about 120 candidates took part as per standardized criteria of selection were enrolled in this study via Hameed Latif Hospital, Lahore. The informed consent was taken from each candidates. Demographics details like name, Operation, sex, BMI details, age & surgery type was documented. All the candidates were divided into two categories via aid of lottery method. During surgery, i-gel was administered in individuals belonging to group A, where as individuals belonging to B were administered disposable LMA. General anesthesia was administered by doctors with respect to standardized protocols. Researchers used trial method. A single surgical team performed these surgeries. After surgical operation, individuals were positioned in surgical wards post operatively. After a day, candidates were checked for sore throat post-operatively .A Performa was made in which all information was documented .

Statistical Analysis: Analysis of data was done via aid of SPSS version 21.0. Age and BMI were documented by SD and mean. Sore throat postoperatively and Gender were depicted via percentage and frequency. A comparison was done with respect to sore throat Postoperatively between two groups via aid of chi-square test. P-value≤0.05as documented as significant. Data was recorded for gender age, BMI, surgery type and device size (3, 4 & 5) in order to deal with modifiers. After application of Post-stratification and chi-square test, P-value≤0.05 were taken as significant.

RESULTS

The candidate mean age was 44.23±15.11years in individuals belonging to i-gel group and 46.10±15.56years in individuals belonging to LMA group. Table 1 In case of i-gel group. 35 females and 25 males were included where as in case of LMA group, there 34 females and 24 males were included. In case of i-gel group, the mean BMI of individuals was 21.52±1.94kg/m^2.In case of LMA group, the individuals mean BMI was 21.92±2.12kg/m^2. As depicted in Table 2 In case of i-gel group, 30(50%) candidates had ASA I where as 30 (50%) candidates had ASA II. In case of LMA group, 30 (50%) candidates had ASA I whereas 30 (50%) candidates had ASA II. As depicted in Table.In case of i-gel group, 20 (33.3%) had undergone cholecystectomy, 17(28.3%) underwent hernia repair, 12(20%) individual undergone mastectomy and whereas 11(18.3%) individuals underwent thyroid surgery. In case of LMA group, 23(38.3%) underwent cholecystectomy, 9(15%) had undergone hernia repair, 13 (21.7%) patients underwent mastectomy and finally 15 (25%) individuals undergone thyroid surgery. Table 2.In case of members of i-gel group, 18 individuals were administered #3 device, in 19 individuals #4 device was given where as in case of 23 individuals #5 device was administered . In case of LMA group, 17 individuals were administered #3 device, 21 were administered #4 device where as 22 candidates were administered #5 device.

Data was arranged with respect to age of patients. In case of candidates ranging from age 20 to 40years, sore throat postoperatively was witnessed was in 1(3.7%) in case of individuals belonging to i-gel group whereas 3 (13.6%) in case of individuals belonging to LMA group. For this age group of patients, The insignificant difference was seen (p>0.05). In case of candidates ranging from age 41 to 60years, sore throat postoperatively was witnessed in 3 (15.0%) in case of individuals belonging to i-gel group whereas 5(20.8%) in case of individuals belonging to LMA group .For this age group of patients, The insignificant difference was seen (p>0.05).

Data was arranged with respect to gender of candidates. In case of male individuals, sore throat postoperatively was witnessed in 4 (16.0%) in case of individuals belonging i-gel group whereas 6 (23.1%) in case of individuals belonging to LMA group . The in significant difference was observed in males population (p>0.05). Data was arranged with respect to BMI of individuals . In candidates having BMI as 18.5 to 22.0kg/m^2, sore throat postoperatively was witnessed in 1 (2.8%) in case of individuals belonging to i-gel group whereas 7 (24.1%) in case of individuals belonging to LMA group . The significant difference was seen for this BMI (p<0.05).

Data was arranged with respect to surgery of participants. The individuals who have gone through cholecystectomy, sore throat postoperatively was witnessed in 2(10%) in case of individuals belonging to case i-gel group while 5(21.7%) in case of individuals belonging to LMA group. The individuals who have gone through repair of hernia , sore throat postoperatively was seen in 1(5.9%) case of individuals belonging to i-gel group whereas 2(22.2%) in case of individuals belonging to LMA group. In patients underwent mastectomy, sore throat postoperatively was witnessed 0 (0%) in case of individuals belonging i-gel group whereas 2 (15.4%) in case of individuals belonging LMA group.

Data was arranged with respect to size of device. In patients who were administered #3 device size, sore throat postoperatively was seen in 1 (5.6%) in case of individuals belonging to i-gel group whereas 3(17.6%) in case of individuals belonging to LMA. The insignificant difference was witnessed (p>0.05). In candidates who were administered #4 size , sore throat postoperatively was seen in 0 (0%) in case of individuals belonging to i-gel group whereas 5(23.8%)in case of individuals belonging to LMA group. The significant (p<0.05) difference was witnessed.

Table 1: Descriptive statistics of age of patients

Age (years)	Group	
	I-gel	LMA
Mean	44.23	46.10
SD	15.11	15.56
Minimum	20	20
Maximum	70	70

Table 2: Comparison of post-operative sore throat in both groups stratified for type of surgery

Surgery	Postop sore throat	Group		p-value
		I-gel	LMA	
Cholecystectomy	Yes	2 (10.0%)	5 (21.7%)	0.298
	No	18 (90.0%)	18 (78.3%)	
Hernia repair	Yes	1 (5.9%)	2 (22.2%)	0.215
	No	16 (94.1%)	7 (77.8%)	
Mastectomy	Yes	0 (0%)	2 (15.4%)	0.157
	No	12 (100%)	11 (84.6%)	
Thyroid surgery	Yes	1 (9.1%)	4 (26.7%)	0.261
	No	10 (90.9%)	11 (73.3%)	

Table 3: Comparison of post-operative sore throat in both groups stratified for device size

Device size	Postop sore throat	Group		p-value
		I-gel	LMA	
#3	Yes	1 (5.6%)	3 (17.6%)	0.261
	No	17 (94.4%)	14 (82.4%)	
#4	Yes	0 (0%)	5 (23.8%)	0.023
	No	19 (100%)	16 (76.2%)	
#5	Yes	3 (13.0%)	5 (22.7%)	0.396
	No	20 (87.0%)	17 (77.3%)	

DISCUSSION

so there were 120 candidates who were operated by aid of general anesthesia. Two groups of candidates were made namely i-gel group and second was disposable LMA group. The candidates mean age was documented as 44.23±15.11years in case of i-gel group and where as10±15.56years in case of LMA group. In case of i-gel group, 25 were males and rest 35 were females. In case of LMA group, 26 was male population whereas 34 were females.

In case of our research, development of sore throat was witnessed in 17 cases (14.2%) such that 4(6.7%) belonging to i-gel group whereas 13 (21.7%) belonging to LMA group. Between both groups, The difference was significant (p<0.05). Soliveres et al., depicted with his case researches that sore throat postoperatively was witnessed in case of 3.4% individuals belonging to I-gel group where as 28.6% in case of individuals belonging to LMA group . The significant difference was witnessed (p<0.05). The individuals belonging to LMA group depicted more dysphagia sore throat as compared to individuals belonging to I-Gel group . So, I-gel mask was recommended.[10] Chauhan et al., also documented that sore throat postoperatively was not present (0%) in case of I-gel where as 17.5% in case of LMA. The significant difference was witnessed (p<0.05). Another case research documented that LMA produced 8% cases of sore throat postoperatively while in case of i-gel only 2% individuals developed postoperative sore throat postoperatively.

But Jadhav et al., done via randomized trial, depicted that sore throat postoperative was witnessed in case of 3.3% individuals belonging to I-gel group where as 16.7% in individuals belonging to LMA group. The insignificant difference was observed (p=0.085).[7] Helmy et al., did another trial and also spoke in favor of this case research and depicted that sore throat postoperatively was seen in 37.5% individuals belonging to I-gel group as well as 37.5% individuals belonging to LMA group. The insignificant difference was witnessed (p=0.34).[8]

Polat et al., also depicted via randomized trial that sore throat postoperatively was witnessed in case of 1.7% individuals belonging to I-gel group as similar to 1.7% individuals belonging to LMA group. The insignificant difference was observed t (p=0.752).[9] Chauhan et al., also documented that sore throat postoperatively was seen in case of 12.5% individuals belonging to i-gel while in individuals belonging to LMA group 16.7%was observed . The insignificant difference was seen (p>0.05).

Dasgupta et al., depicted controversial conclusions. In their randomized trial the sore throat incidence at 2 hour in about 18% with individuals belonging to disposable LMA where as 6% in individuals belonging to i-gel group. The difference was significant i.e. p<0.05.

Kinkle and Levitan made an assumption that LMA insertion along with inflatable mask cause inflated edge of the mask to grasp the epiglottis edge and results in down-folding or improper positioning underneath the tongue. Brimacombe et al. made an assumption that problem in placing LMA-Proseal was due to large cuff that results in impeding intra-oral placement digitally and cause propulsion inside the pharynx due to the lack of back plate cuff.

Gabbott *et al* documented similar results by using I-gel by proving the fact that it gives sealing pressure in a satisfactory way which further show improvement after a period of time might be due to its thermoplastic properties which aid in providing good sealing pressure to larynx after heating to temperature of body. Many case researches have been carried out with respect to make comparison of sealing pressure efficacy of I-gel as compared with LMA, which showed similarity in sealing pressure of I-gel to LMA-Proseal and more as compared to Classic LMA as well as LMA-Unique, it is therefore can be utilized for ventilation without involving any risk for aspiration.

Data was arranged with respect to age of patients . In case of candidates ranging from age 20 to 40years, sore throat postoperatively was witnessed was in 1 (3.7%) in case of individuals belonging to i-gel group whereas 3 (13.6%) in case of individuals belonging to LMA group . For this age group of patients, The insignificant difference was seen (p>0.05). In case of n candidates ranging from age 41 to 60years, sore throat postoperatively was witnessed in 3 (15.0%) in case of individuals belonging to i-gel group whereas 5 (20.8%) in case of individuals belonging to LMA group .For this age group of patients, The insignificant difference was seen (p>0.05). In case of candidates ranging from age more than 60years, sore throat postoperatively was seen in 5 (35.7%) in case of individuals belonging to LMA group whereas nil in case of individuals belonging to i-gel group .The significant difference was witnessed (p<0.05).

Data was arranged with respect to gender of candidates. In case of male individuals, sore throat postoperatively was witnessed in 4 (16.0%) in case of individuals belonging i-gel group whereas 6(23.1%) in case of individuals belonging to LMA group. The in significant difference was observed in males population (p>0.05). In case of female candidates, sore throat postoperatively was witnessed in 0 (0%) in case of individuals belonging i-gel group whereas 7 (20.6%) in case of individuals belonging to LM group . For females, the significant difference was witnessed (p<0.05).

Data was arranged with respect to BMI of individuals. In candidates having BMI as 18.5 to 22.0kg/m^2, sore throat postoperatively was witnessed in 1(2.8%) in case of individuals belonging to i-gel group whereas 7(24.1%) in case of individuals belonging to LMA group. The significant difference was seen for this BMI (p<0.05). In candidates BMI ranging from 22.1 to 25.5kg/m^2, postoperative sore throat was seen in 3 (12.5%) in case of individuals belonging to i-gel group whereas 6(19.4%) in case of individuals belonging to LMA group . The insignificant difference was witnessed for in case of BMI (p>0.05).

Data was arranged with respect to surgery of participants. The individuals who have gone through cholecystectomy, sore throat postoperatively was witnessed in 2(10%) in case of individuals belonging to case i-gel group while 5 (21.7%)%) in case of individuals belonging to LMA group. The individuals who have gone through repair of hernia , sore throat postoperatively was seen in 1 (5.9%) case of individuals belonging to i-gel group whereas 2(22.2%) in case of individuals belonging to LMA group . In patients underwent mastectomy, sore throat postoperatively was witnessed 0 (0%) in case of individuals belonging i-gel group whereas 2 (15.4%) in case of individuals belonging LMA group. In the individuals who have gone through thyroid surgery, sore throat postoperatively was witnessed was in 1(9.1%) in case of individuals belonging i-gel group while 4(26.7%) in case of individuals belonging LMA group. The insignificant (p>0.05 difference was seen.

Data was arranged with respect to size of device. In patients who were administered #3 device size, sore throat postoperatively was seen in 1(5.6%) in case of individuals belonging to i-gel group

whereas 3(17.6%) in case of individuals belonging to LMA. The insignificant difference was witnessed (p>0.05). In candidates who were administered #4 size , sore throat postoperatively was seen in 0 (0%) in case of individuals belonging to i-gel group whereas 5(23.8%) in case of individuals belonging to LMA group. The significant (p<0.05) difference was witnessed. In case of candidates patients who were administered #5 device size, sore throat postoperatively was in 3(13%) in case of individuals belonging to i-gel group whereas 5(22.7%) in case of individuals belonging to LMA. The insignificant (p>0.05) difference was seen.

CONCLUSION

In a nutshell, i-gel has produced less sore throat postoperatively as compared to LMA. Now for future reference, we will make use of i-gel besides LMA in case of patients undergoing general anesthesia, since we got the evidence locally now. Thus i-gel produce much better results as compared to LMA in case of general anesthesia due to reduced sore throat incidences post operatively.

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