

Safety and Efficacy of I-Gel™ for Airway Management in Children Undergoing Inguinal Hernia Repair

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ABSTRACT

Objective: To determine the safety and efficacy of I-gel™ for airway management in children undergoing laparoscopic inguinal hernia repair.

Study Design: Retrospective study

Place and Duration: This study was conducted at the Department of Anesthesia and Pediatric Surgery Mohi-ud-Din Teaching Hospital Mirpur AJK from November 2017 to January 2019.

Materials and Methods: Total 140 patients of both genders with ages up to 15 years undergoing ambulatory laparoscopic inguinal hernia repair were included. Patient's detailed demographics including age, sex, weight and ASA class were recorded after taking written consent from parents/guardians. I -gel™ device was used to airway management. Complications such as regurgitation, aspiration, laryngospasm, bronchospasm, airway obstruction, and conversion to an endotracheal tube were examined. Data was analyzed by SPSS 24.0.

Results: There were 90 (64.29%) male while 50 (35.71%) female patients with mean age 7.42±5.66 years. Majority 126 (90%) patients had ASI class I. Complications were found in 5 (3.57%) patients, in which 2 (1.43%) patients had bronchospasm, 2 (1.43%) patients had laryngospasm and 1 (0.71%) patient had conversion to endotracheal tube. None of patients had regurgitation, aspiration and airway obstruction.

Conclusion: I -gel™ device to airway management was safe and effective with fewer rate of respiratory complications in children undergoing ambulatory laparoscopic inguinal hernia repair.

Keywords: Laparoscopic Inguinal Hernia Repair, Airway Management, I -gel™, Regurgitation, Aspiration, Laryngospasm, Bronchospasm.

INTRODUCTION

Inguinal hernia (IH), which accounts for 15 percent of the surgery, is one of the most frequent cases of surgical reparation in the paediatric population^[1]. Its occurrence in children of all ages was stated to be 0.8 to 4.4%^[2].

Supraglottic airways (SAD) are built to keep the airway open while sealing the larynx. It can be used in optional surgery as an airway rescue method in failed tracheal intubation as a tracheal intubations canal or in hospital and off-hospital circumstances, such as cardiorespiratory arrests^[3].

SADs have been used to protect the airway properly without significant spontaneous and controlled ventilation in paediatric anaesthesia by Lopez-Gil et al^[4].

Since 2010, the I has been sold commercially in children's measurements. It has a non-inflatable mango and a further lumen for active or passive gastric drainage (except in size 1). It is sold in four children's sizes (1, 1.5, 2, and 2.5)^[5]. Earlier research demonstrated protection and effectiveness with the use of supraglottic devices as an alternative to paediatric laparoscopic intubation based on intragastric pressure, aspiration risks and ventilation parameters^[6-8]. This has been shown in previous studies. However, only 6.21 percent of respondents use the SGD in laparoscopic procedures in a study of realistic habits of paediatric anesthesiologists^[9]. The use of SGD has been shown to minimise postoperative deauration, laryngospasm, poison, breath retention, sore throat, and length of stay in the postoperative anaesthesia compared to endotracheal tubes^[10].

We conducted present study to determine the safety and efficacy of i-gel™ device insertion for airway management in children undergoing ambulatory laparoscopic inguinal hernia repair.

MATERIALS AND METHODS

This retrospective study was at the Department of Anesthesia and Pediatric Surgery Mohi-ud-Din Teaching Hospital Mirpur AJK from November 2017 to January 2019.. A total 140 patients of both genders with ages up to 15 years having ASA class I and II undergoing ambulatory laparoscopic inguinal hernia repair under general anesthesia were enrolled in this study. Patient's detailed demographics including age, sex, weight and ASA class were recorded after taking written consent from parents/guardians. Patients with severe respiratory complications and those with no consent were excluded.

I-gel™ device was used to airway management. Complications such as regurgitation, aspiration, laryngospasm, bronchospasm, airway obstruction, and conversion to an endotracheal tube were examined. Data was analyzed by SPSS 24.0.

RESULTS

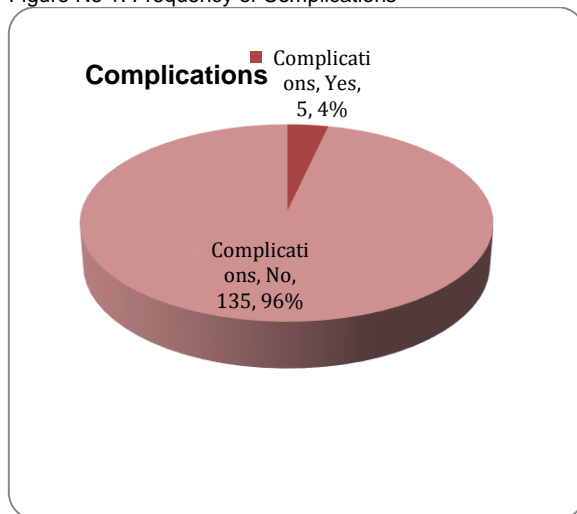
Out of 140 patients, 90 (64.29%) were male while 50 (35.71%) were females with mean age 7.42±5.66 years. Mean weight was 22.16±9.48 kg. 126 (90%) patients had ASI class I and 14 (10%) had ASA class II. (Table 1)

Table No 1: Baseline details of all the patients

Characteristics	Frequency NO.	%age
Mean age (Yrs)	7.42±5.66	-
Mean weight (kg)	22.16±9.48	-
Gender		
Male	90	64.29
Females	40	35.71
ASA Class		
I	126	90
II	14	10

Complications were found in 5 (3.57%) patients, while 135 (96.43%) patients developed no complication. (Figure 1)

Figure No 1: Frequency of Complications



Among patients who developed respiratory complications, 2 (1.43%) patients had bronchospasm, 2 (1.43%) patients had laryngospasm and 1 (0.71%) patient had conversion to endotracheal tube. None of patients had regurgitation, aspiration and airway obstruction. (Table 2)

Table No 2: Complications during airway management

Variables	Frequency NO.	% age
Brochospasm	2	1.43
Laryngospasm	2	1.43
Conversion ETT	1	0.71
Regurgitation	0	0
Aspiration	0	0
Airway obstruction	0	0

DISCUSSION

The intraoperative pulmonary mechanics is adversely affected by laparoscopic surgery and are thus the most serious measure of the airway device's efficacy⁽¹¹⁾. In laparoscopic surgical surgeries, Tracheal intubation is suitable for airway control as it offers sufficient ventilation and protects against pulmonary aspiration, even if the airway pressure is enhanced by carbopertoneum. The system is however not insensitive to aspiration. Also in laparoscopic procedures, endobronchial intubation is not rare, and it can fail in difficult airway conditions. Some of these problems even with obese and airway-pressures can

also be resolved by I-gel and other EGDs, which require ample ventilation^[12]. The present study was conducted to examine the safety and efficacy of i-gel™ device insertion for airway management during general anesthesia in children undergoing ambulatory laparoscopic inguinal hernia repair. In this regard 140 patients were included. Majority 64.29% were male while females were 35.71% and the mean age of patients was 7.42±5.66 years. Majority 126 (90%) patients had ASA class I. many of previous studies demonstrated that males children were predominant and accounted above 60% whom undergoing laparoscopic inguinal hernia repair and the average age was 10 years^[13-14].

In present study we found that 5 (3.57%) patients had developed complications during anesthesia period while 96.43% patients had developed no complication. So the effectiveness rate was 96.43%. Among patients who developed respiratory complications, 2 (1.43%) patients had bronchospasm, 2 (1.43%) patients had laryngospasm and 1 (0.71%) patient had conversion to endotracheal tube. A study conducted by Hipolito C et al^[15] regarding airway management by i-gel device in children undergoing ambulatory laparoscopic inguinal hernia repair and they reported that adverse events were found in 4 patients out of 230. Among these 1.30% patients had bronchospasm and 0.87% patients had developed laryngospasm, none of patients need ETT conversion.

A study by Badheka, et al^[16] regarding I-gel verses endotracheal tube in laparoscopic surgeries and they reported that I-gel was more effective in term of ease of insertion, and complications during anesthesia as compared to ETT. A further Ozdamar et al. study^[17] compared the use of ETT and Classical LMATM to show that intra-lastic pressure, risk to gastrical content or ventilation parameters were not significantly affected by the use of supraglottic instruments.

Sinha et al^[18] have found similar ProSealLMATM findings. A recent comparative studies in pediatric patients between ETT and I-gel™ found that I-gel is comparable to ETT in hemodynamics and ventilation adequacy and is related to fewer post-operative complications^[19].

CONCLUSION

We concluded from this study that I -gel™ device to airway management was safe and effective with fewer rate of respiratory complications in children undergoing ambulatory laparoscopic inguinal hernia repair. Also it was a better alternative to endotracheal tube insertion.

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