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The incidence rate of epigastric pain after laryngeal mask anesthesia in cataract surgery: A descriptive-sectional study

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ABSTRACT

Epigastric pain is a condition in which the increase of airway pressure to deal with partial or complete obstruction of airway during mechanical ventilation of lungs occurs or caused by the entrance of too much air to the stomach. This ventilation condition occurs with all methods of airway. In cases where laryngeal mask has not suitable placement can cause partial obstruction of airway and causes increased pressure of airway and the air entrance to the stomach. This research is a gradual randomized study was performed on 600 patients referred for cataract surgery. Data collection included questionnaire containing demographic information and questions about the epigastric pain. The data were analyzed by Chi-square, Kolmogorov-Smirnov, Mann-Whitney tests and SPSS software. There is a significant relationship between epigastric disease history and epigastric pain in recovery, and between heartburn and the diameter of laryngeal mask (p -value < 0.05). There is a significant relationship between epigastric disease history and duration of the use of masks, air volume delivered to the patient, age and body weight of the patients (p -value < 0.05). There is a significant relationship between epigastric disease history and epigastric pain in recovery and history of heartburn.

Keywords: laryngeal mask, cataract, epigastric.

INTRODUCTION

Cataract is existence of any type of opacity in the lens. The most common cause of cataracts is age. Cross-sectional studies have found the prevalence of cataracts 50% at the age of 65-74 years which increases up to 70% at the ages over 75 years. 90% of the all cataracts are age dependent. It has been identified in several studies that p(the prevalence of cataract in women is more than men and most of the patients are older than 65 years. Sudden moves or attempts to cough at the time of openness of the eye can lead to protrusion of eye contents and permanent damage. For this reason, when the general anesthesia is chosen for cataract surgery, it is necessary to maintain sufficient depth of anesthesia. The biggest responsibility of the anesthesiologist is to provide sufficient ventilation for the patient and the most critical factor in this field is to maintain the airway. The laryngeal mask airway (LMA) is a non-invasive alternative approach is appropriate to replace endotracheal intubation and is an acceptable method in short-term procedures and difficult intubations which due to the no need for laryngoscopy doesn't have the adverse consequences related to it. Several ways have been described for the placement of laryngeal mask and reduce its

complications. One of these methods is the classic method and classic method with a little perk. At the standard placement method, usually its cuff is empty and the rate of success at the first attempt is 67-90%. A little perk of laryngeal cuff has a useful role in its passage from posterior arch and lead to easier placement and more success. The high cuff inflation could cause the further tighten the LMA, reduce compliance on the larynx, loss of protection of airway, pressure on the veins and nerve harm and related to the material can absorb anesthetic gases and cause increased pressure to the mucous. LMA could cause coughing, pressure and spasm of the larynx in patients not having deep anesthesia and active reflexes.

Laryngeal mask could increase the possibility of laryngeal spasm because of the increased airway secretions at the end of surgery and for this purpose and reducing the vagal reflex (VAGUE), nausea and vomiting after surgery, prescribing the anticholinergic drugs is useful. Laryngeal complications during anesthesia can cause sore throat, nausea, vomiting and abdominal pain, which studies have been conducted in this regard. On average 8.1% of patients complain of mild sore throat after surgery. In a study, the incidence of nausea and vomiting in common laryngeal mask has been shown 20% and 8.3% respectively. Also in the of abdominal pain complication, 7 patients (11.7%) of the common laryngeal mask group there has been complaints of abdominal pain. When the placement of mask because of the mask tip kink is not correct or there is a obstruction in airway in the epiglottis region because of the curvature, the drainage cuff should be pulled and be placed again. In cases where the LMA is not placed properly, can cause partial obstruction of the airway and increase airway pressure and the air intake to the stomach. Establishment of hemodynamic stability with LMA shows that it can be used easily in people with cardiovascular and respiratory diseases. Embedded laryngeal mask during the induction of anesthesia could prevent the sharp rise in blood pressure and tachycardia during the induction of anesthesia. Therefore, a simple way to protect the airways that makes effective breathing and oxygenation is using the LMA. Given that the abdominal pain is a rare complication of laryngeal masks and few studies have been cited about it before and moreover, the incidence of epigastric pain that can be seen in the Jahrom hospitals shows higher prevalence; The studying the incidence of epigastric pain after laryngeal mask anesthesia after surgery seems necessary.

MATERIALS AND METHODS

The present study was gradual random sampling. On patients undergoing cataract surgery with laryngeal mask anesthesia. This study was performed after approving the research plane, permission from vice president of research and after coordination with operation room staff and the head of the Motahari hospital. The questionnaire used in this study included demographic data (age, sex, weight) and questions about medical history in the epigastric region, a history of heartburn, diameter of laryngeal mask, duration of the use of masks, air volume delivered to the patient and pain in epigastric area. Method of the study was that we examined the patients undergoing eye surgery (cataract) which laryngeal mask was used for their anesthesia after recovery and asked them about the presence of epigastric pain (yes or no). Before the patient was asked about history of heartburn and stomach pain not to confuse the abdominal pain because of history of stomach problems with abdominal pain caused by the use of laryngeal mask, during the examination after consciousness of the patient.

RESULTS

The participants in the survey were 54.2% male and 45.8% female. The mean and SD of the age of participants was 60.93 ± 12 in the polls. Minimum age was 21 and maximum was 87 years. The mean and SD of the weight of the participants in the survey was 66.41 ± 8.85 . Minimum and maximum weight was 50 and 97 kg respectively. Of the subjects, 22.5% had a history of disease in epigastric region, 29.5% had a history of heartburn and 34.7% had pain in epigastric region (Table 1). 5% had a diameter of laryngeal mask 3, 61.7% and 0.8% had a diameter of 4 and 0.8% had a diameter of laryngeal mask, 5. Duration of mask usage was 27.78 ± 12.60 min and the air volume delivered to the patient was 25.40 ± 15.19 cc.

Table1. The prevalence of history of disease in the epigastric region, heartburn and epigastric pain during recovery

	Yes		NO	
	Count	%	Count	%
history of disease in the epigastric region	135	22.5%	465	77.5%
history of heartburn	177	29.5%	423	70.5%
epigastric pain during recovery	208	34.7%	392	65.3%

According to Chi-square test there is a significant relationship between medical history in epigastric region and pain in epigastric region during the recovery and between heartburn and the diameter of laryngeal mask (p-value < 0.05, Table 2).

Table2. Comparison of relationship between medical history in epigastric region and the diameter of laryngeal mask, heartburn and pain in epigastric region during the recovery

			medical history in epigastric region		Chi-Square	p-value
			Yes	NO		
the diameter of laryngeal mask	3	Count	80	145	56.351	0.00
		%	35.6%	64.4%		
	4	Count	50	320		
		%	13.5%	86.5%		
	5	Count	5	0		
		%	100.0%	0.0%		
Heartburn history	Yes	Count	112	65	239.402	0.00
		%	63.3%	36.7%		
	No	Count	23	400		
		%	5.4%	94.6%		
pain in epigastric region during the recovery	Yes	Count	83	125	55.301	0.00
		%	39.9%	60.1%		
	No	Count	52	340		
		%	13.3%	86.7%		

According to K-S test the data of duration of mask usage and the volume of delivered air to the patient, age and weight are not normal(p-value < 0.05, Table 3).

Table 3. The study of normalization of data using Kolmogorov-Smirnov test

	age	weight	Duration of mask usage	Volume of the delivered air
Kolmogorov-Smirnov Z	3.319	2.794	4.157	6.842
p-value	.000	.000	.000	.000

According to non-parametric mann-Whiney test, there is a significant relationship between medical history in epigastric region and duration of the usage of the mask, volume of the air delivered to the patient, age and weight of the patient (p-value < 0.05, Table 4).

Table 4. Comparison of relationship between medical history in epigastric region and duration of the usage of the mask, volume of the air delivered to the patient, age and weight of the patient

	medical history in epigastric region	N	Mean	SD	Mean Rank	Sum of Ranks	Mann-Whitney U	p-value
duration of the usage of the mask	Yes	135	23.17	11.32	241.76	32637.50	23457.50	0.00
	NO	465	29.13	12.65	317.55	147662.5		
duration of the usage of the mask	Yes	135	28.53	28.59	334.29	45129.00	26826.0	0.00
	NO	465	24.50	7.65	290.69	135171.0		
Age	Yes	135	56.75	14.16	246.69	33303.50	24123.5	0.00
	NO	465	62.15	11.02	316.12	146996.0		
Weight	Yes	135	66.41	8.85	274.66	37079.50	27899.50	0.046
	NO	465	1.77	.41	308.00	143220.5		

DISCUSSION

In this study, 22.5% of the subjects had medial history in epigastric region, 29.5% had history of heartburn and 37.5% had pain in epigastric region. Results showed that there is a significant relationship between medial history in epigastric region and epigastric pain in the recovery and history of heartburn. Also there is a significant relationship between medial history in epigastric region and duration of the usage of masks, air volume delivered to the patient, age and weight. Desirable anesthesia is associated with increased patient satisfaction with hospital services, particularly surgical procedures. Therefore, trying to reduce the common patient complaints from anesthesia is a useful step in that direction. Airway management of patients is an important part of anesthesia care. In this regard, the different equipment is used that the most common type for cataract surgery is laryngeal mask which has its own

complications. Epigastric pain is a condition in which the increase of airway pressure to deal with partial or complete obstruction of airway during mechanical ventilation of lungs occurs or caused by the entrance of too much air to the stomach. The results of this study showed that related to the incidence of pain in epigastric region after anesthesia with laryngeal mask in cataract surgery, 34.7% had pain in epigastric region, 5% had a diameter of laryngeal mask 3, 61.7% and 0.8% had a diameter of 4 and 0.8% had a diameter of laryngeal mask, 5 which these results don't agree with the results of the study of timmermann and Achmet conducted about complication of abdominal pain in orthopedic surgery and the LMA and common laryngeal mask but it agrees with the study of Hajiesmeili et al. Hajiesmaeili et al in their study by comparing the performance of the Supreme LMA laryngeal masks with the common laryngeal mask used in patients undergoing orthopedic surgery reported that 2 patients (3.2%) out of Supreme LMA and 7 (11.7%) out of common laryngeal masks had abdominal pain complaints during recovery. He expressed that although the pain was diagnosed as a complaint of patients after surgery, but there was no significant difference between supreme and common laryngeal mask group. In a study, Jahanbakhsh et al (2008) in khatamolanbia hospital of Mashhad, 100 patients undergoing cataract surgery were divided randomly into two groups. Demographic characteristics were similar in both groups. In one group after induction of anesthesia, the anesthesia maintained using Propofol (80 to 100 micrograms per kg per minute) and the other using remifentanil (0.20 to 0.25 µg per minute). The incidence of abdominal pain and its quality were studied in two recovery groups. Information and characteristics of the patients were recorded in questionnaire before and after surgery. In the end, they concluded that in the remifentanil group, 20 patients (40%) complained about severe abdominal pain in recovery, in the propofol group only 3 patients (6%) complained about a dull pain around the abdomen and two groups didn't show significant difference ($p < 0.001$). In a study conducted by Schraag in 2009 on the 51 patients that had been delivered alfentanil after cardiac surgery and 30 patients had been delivered remifentanil after orthopedic surgery, there were no significant differences in the incidence of post-operative pain.

CONCLUSION

The results of this study showed that there is a significant difference between medical history in epigastric region and epigastric pain in recovery and between heartburn history and the diameter of laryngeal mask. According to the obtained results from this study and the partially high incidence of epigastric pain it the following research topics about this field are proposed:

- 1- Comparison of the effect of fentanyl, alfentanil, remifentanil and sufentanil in the incidence of epigastric pain after cataract surgery
- 2 - Effect of Naloxone on improving the pain in the epigastric region after cataract surgery in patients receiving short time -acting drug
3. The evaluation of agitation effect in recovery after cataract surgery
4. Comparison of laryngeal masks and endotracheal intubation in the incidence of epigastric pain after cataract surgery.

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