Incidence and relation of cough, after major ear surgical procedures under general laryngeal mask airway anesthesia,with some demographic factors

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Abstract: To evaluate the frequency of cough after major ear surgical interventions undergoing general laryngeal mask airway anesthesia. Our prospective investigation included 162 subjects,aged 20-50 years,of both sexes,classed I-II according to the American society of anesthesiologists and scheduled for major ear surgical techniques at King Hussein hospital,King Hussein medical city,Amman,Jordan,during the period Jan 2011-Jan 2013.Anesthesia in all subjects was induced and maintained using general intravenous laryngeal mask airway anesthesia.Incidence of postoperative cough was assessed and analyzed using Student's t test.P value was considered statistically significant if it was <0.05.Overall postoperative cough incidence was 4.9% of all study group patients,most commonly in those aged 20-30 years(62.5% of subjects with cough). Insertion of laryngeal mask airway in patients assigned for major ear operations is associated with significant reduction in immediate postoperative cough.
(Altamimi Sh,Maayah A,Jraisat I,Gabha A).Study of Jordanian surgical group assigned for major ear surgical interventions.

***Key words**:Anesthesia:cough,general,laryngeal mask;demographic;surgery:ear.*

1. Introduction

Postoperative cough during recovery from general anesthesia is a frequent problem due to stimulation of the trachea during endotracheal extubation.Tracheal intubation with an endotracheal tube is often neede during anesthesia.Inflating the endotracheal tube can cause coughing during recovery.Insertion of an endotracheal tube is associated with laryngospasm,sore throat,arytenoid dislocation,cough and vocal cord paralysis(1).

The use of laryngeal mask airway is a safe technique in many surgical interventions.Placement of laryngeal mask airway can maintain a good airway during general anesthesia with few but not serious bad events,and so it can replace placement of endotracheal tube.

In 1999,a study of 100 patients scheduled for major ear surgery under laryngeal mask airway anesthesia revealed that 3% of patients reported postoperative sore throat.Neither hoareseness nor laryngospasm were reported.The study concluded that laryngeal mask airway is a safe tool to be used during general anesthesia for patients scheduled for major ear surgery(2).

Many problems associated with anesthesia may occur in the immediate postoperative period and it is essential that supervision by adequately trained and experienced personnel is continued during the recovery period.

The objective of our investigation was to assess the frequency of postoperative cough after major ear surgery planned for general intravenous laryngeal mask airway anesthesia.

2. Material and Methods

Our prospective investigation enrolled 162 subjects,of both genders,aged 20-50 years,classed I-II by the American society of anesthesiologists and assigned for elective major ear surgical interventions at King Hussein hospital.King Hussein medical city,Amman,Jordan,during the period Jan 2011-Jan 2013,after obtaining approval of our local research and ethical committee of the royal medical services and participants written informed consent.Excluded patients were whom have upper respiratory tract infection,asthma and history of laryngeal or tracheal pathology.

Anesthesia was induced and maintained using general intravenous anesthesia administering fentanyl 2mcg/kg,propofol 2mg/kg and tracurium 0.5mg/kg after which a proper laryngeal mask airway size 3 was inserted for female patients and laryngeal mask airway size 4 was inserted for male patients.Laryngeal mask airway cuff was inflated with air according to standard international guidelines.Through laryngeal mask airway a mixture of oxygen 33% and 1%MAC of sevoflurane were delivered to all patients,maintaining an end tidal CO2 around 35-40 mmHg,by adjusting respiratory rate and total gas volume.Monitoring of patients included ECG,non-invasive blood pressure,SpO2 and end tidal CO2.Postoperative cough was assessed and compared to some patients demographics,such as age groups(20-30y,31-40 y and 41-50 years),patient gender,duration of surgery and type of ear surgery.A cough was recorded as either having happened or not having happened during the initial and immediate 10 min of postremoval interval.

Information was analyzed using Students T and Chi-square tests.P value <0.05 was considered statistically significant.

3. Results

There were no significat differences regarding the demographic data in our study.48.2% of our subjects were females while 51.8% were males.P>0.05.35.8% of our patients were aged 20-30 years,31.5% of patients were aged 31-40 years and 32.7% were aged 41-50 years(P>0.05). Patients classed ASA I were found to be 48.8% and those classed II were found to be 51.2%.P>0.05.Regarding surgical procedures and duration of surgery there were significant differences.Patients with tympanoplast occupied the commonest surgery(67.9%),patients with mastoidectomy occupied the second commonest(25.9%) and patients with osiculoplasty occupied the third commonest(6.2%).P<0.05..Surgical interventions lasting less than 1 hour were the commonest (58.6%),interventions lasting less than 3hours were the second commonest(28.4%) and interventions lasting less than 2hours were the third commonest (12.9%).P<0.05.Table 1.

Postoperative cough was produced in only 4.9%(8) of total study patients.Regarding its relation with age ,cough occurred in 62.5%(5),of total coughing patients, in patients aged 20-30 years,while it occurred in 25%(2) ,of total coughing patients,in patients aged 31-40 years and was produced in 12.5%(1) ,of total coughing patients,in patients aged 41-50 years.P<0.05.Table 2.Males were less affected than females in experiencing postoperative cough.Of total of 8 patients who had cough,6(75%) were females and 2(25%) were males.P<0.05.Postoperative cough was most frequently encountered in patients who had duration of surgery prolonged more than 3hours(62.5%, 5),while cough was produced in 25%(2) when duration of surgery was more than 2hours and cough was found to be 12.5%(1) when duration of surgery was more than 1hour.P<0.05.Table 2.When we analyzed cough relation with type of surgery,it was found to be 50%(4)(p<0.05) in mastoidectomy while it was 25%(2) in each tympanoplasty and osiculoplasty.P>0.05.Postoperative cough was found to be equally (50%,2) in ASAI and ASA II patients.P>0.05.

Table 1: Distribution of hospital workers with regard to their descriptive characteristics

parameter	description
number	162
ASA I	79
II	83
Age 20-30y	58
31-40y	51
41-50y	53
Gender M	84
F	78
Surgical procedure	
Mastoidectomy	42
Tympanoplasty	110
osiculoplasty	10
Duration of surgery	
>3h	46
>2h	21
>1h	95

Table 2.Postoperative cough characteristics(no).

parameter	description	P
incidence	8	
Age		
20-30y	5	<0.05
31-40y	2	
41-50y	1	
Sex		
M	2	<0.05
F	6	
Duration of surgery		
>3h	5	<0.05
>2h	2	
>1h	1	
Type of surgery		
Mastoidectomy	4	<0.05
Tympanoplast	2	>0.05
osiculoplast	2	>0.05
ASA		
I	4	>0.05
II	4	

4. Discussions

Since 1991, LMA was approved by the FDA and used in airway management(3).Its advantages to endotracheal tube include less cardiovascular reaction,easy placement and reduction of vocal cord paralysis (4).Insertion og LMA is used frequently nowadays in all cases of general anesthesia unless contraindicated.Placement of LMA is indicated firmly in ear surgery as it causes no superior airway activation in the recovery room.

In 2009,Taheri A et al,assessed patients aged 3-70 years undergoing major ear surgery using laryngeal mask airway(5).In this investigation ,postoperative cough was produced in 0.5% of patients,less commonly in the age group 3-7 years(2,20%) and in the age group 8-15 years (2,20%) while 6 patients,60% in the age group 16-40 years experienced postoperative cough.Patients aging from 41 to more than 60 years did not had cough.In the same study ,females were more affected by postoperative cough than males and surgery lasting more than 4 hours was associated with more cough(5).Coughing caused by an endotracheal tube may complicate recovery from general anesthesia.Irritant or stretch nociceptive stimuli in the trachea caused by the tube are the potential causes.Rapidly acting receptors are found superficial in the trachea(6).They are the irritant receptors of cough reflex(7).

The intact protective reflexes are present above the vocal cords.Expansion of the air filled cuff due to diffusion of N2O into it may cause increased receptor stimulation in the tracheal mucosa,increasing emergence and extubation phenomena.Coughing during recovery may lead to increased intracranial pressure and surgical bleeding(8) which is of great importance in major ear surgery.Post-endotracheal tube extubation incidence of cough was around 96% in Gonzalez et al study(8).In another investigation,the frequency of coughing during the time period 0-2 min was 38%,from 2-4min,the frequency of coughing was 38%.From 4-8min,the incidence was 34%(9).

In conclusion:

Laryngeal mask airway is associated with low incidence of postoperative cough in the initial postremoval period after general anesthesia of ear surgery,a finding that may be of advantage in some patients in which this is required for decreasing adverse emergence phenomena.

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