Original Article

Use of topical and IV Lignocaine in breast surgery

Comparison Between Topical and Intravenous Xylocaine on Pharyngo-Laryngeal Complications in Breast Surgery Patients

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ABSTRACT

Objective: to compare the immediate pharyngo-laryngeal complications using topical and intravenous lignocaine in daycase breast surgery patients.

Study Design: Randomised control trial study.

Place and Duration of Study: This study was conducted at the Department of Anaesthesiology , ICU and Pain medicine,Liaquat National Hospital, Karachi during July 2009 and August 2010.

Materials and Methods: In this article, we included eighty six ASA I and II, elective breast surgery female patients. Patients were randomized into group I (intravenous lignocaine) and group T (topical lignocaine).Topical lignocaine was sprayed using tongue depressor over base of tongue and posterior pharynx area. After one minute of propofol induction, consultant anaesthetist inserted appropriate size deflated LMA. Conditions for LMA insertion i.e; gagging, coughing or laryngospasm were recorded. Acceptable conditions if no gagging, coughing or laryngospasm resulting in successful first-pass placement and ventilation recorded.

Results: Elective breast surgery patients were randomly assigned to two groups, group I (intravenous lignocaine) and group T (topical lignocaine).The mean age in group I was 30+/- 9 years and in group T it was 31+/- 10 years. There were 86 females of which 45 females in group I and 41 females in group T. LMA insertion was compared among 86 females who underwent breast surgeries. Immediate pharyngo-laryngeal complications were noted in 5 (11.1%) in group I patients while none in group T patients. In comparison between age less and more than 30 years patients, more complications in more than 30 years age group and more in I group patients 5 (24%) while only 1 (4%) in group T ($p<0.04$).

Conclusion: Topical 4% lignocaine application spray over base of tongue and posterior pharynx area reduces immediate pharyngo-laryngeal complications in day case female patients more effectively than 2% intravenous lignocaine without using any intravenous muscle relaxation agent. Improving patient comfort and readiness for early discharge in ambulatory surgeries may be attributed to this anaesthesia technique.

Key Words: LMA, gagging, coughing, laryngospasm

Citation of article: Shazad M, Nadeem SM. Comparison Between Topical and Intravenous Xylocaine on Pharyngo-Laryngeal Complications in Breast Surgery Patients. Med Forum 2020;31(5):66-69.

INTRODUCTION

Day case breast surgery patients present a unique challenge to the anaesthesiologists. Different strategies been employed to prevent complications and readiness to discharge within 23 hours.[1] Breast surgeries in the low income countries with limited resources pose a mounting task.

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Received: December, 2019
Accepted: February, 2020
Printed: May, 2020

Total intravenous anaesthesia, paravertebral blocks, pec blocks all effective but resource intensive. Multiple different placement techniques been devised for range of laryngeal mask airways.[2] Decreasing the pharyngo-laryngeal complications by using variety of medications to improve upon airway instrumentations and recovery.[3]Morbidity decreases during general anaesthesia with laryngeal mask airway placement in breast surgery female patients enabling readiness for early discharges.[4]

Airway morbidity using endotracheal intubation poses serious challenges to anaesthesiologists especially during ambulatory surgeries.[5] Laryngeal mask airway as an alternative to endotracheal tube has revolutionized the field of Anaesthesia.[6] The placement of laryngeal mask airway appears easy but complications free placement requires deep anaesthesia and attenuation of phrayngo-laryngeal reflexes. Multiple drug combinations been experiemented for uneventful airway management. Increasing the dose of anaesthetics or opioids may result in adverse effects to the patients. Addition of muscle relaxants may delay the reversal

process from anaesthesia and adverse respiratory complications. Even acupressure and acupuncture been advocated for adequate attenuation of airway reflexes. Godsend LL30 to Xylocaine (Acetanilide) or Lidocaine (m-xylidide) was discovered at the Institute of Chemistry at Stockholm university, Stockholm.[7] First clinical trials of lidocaine was conducted by pioneer Swedish anaesthesiologist, Torsten Gordh.[8] Different modes of administration of xylocaine like intravenous, gel application, spray, nebulization, subarachnoid, epidural and nerve blocks have been used.Different concentrations and different doses of xylocaine used to reduce pharyngo-laryngeal complications in different studies.

Therefore, we test the hypothesis that use of 4% topical lignocaine prior topropofol induction could reduce the immediate airway complications when compared with 2% intravenous lignocaine prior to propofol induction in breast surgery female patients during ambulatory surgeries.

MATERIALS AND METHODS

After approval from hospital ethics review committee, informed written consent was ensured from study participants.Randomization into equal groups was done using simple sealed envelope technique prior to study initiation and opened prior to anaesthesia by the investigator who will give topical or intravenous lignocaine. Exclusion of emergency cases, risk of gastric content aspiration, pregnant females, co-existing renal or liver disease, limited mouth opening, known allergy to study drugs, refusal to give consent were excluded.

In operating room,standard monitoring, including non invasive blood pressure, pulse oximeter and ECG placed on patients. A baseline heart rate and blood pressure were recorded.Group I received intravenous lignocaine 1.5 mg/kg followed by pre-oxygenation for three minutes. Group T received 5 ml of 4% lignocaine spray to the posterior pharynx and base of tongue area in sitting position after depressing the tongue with a tongue depressor. The patients were advised to gargle as tolerable and turned supine immediately followed by pre-oxygenation for 3 minutes. After 3 minutes pre-oxygenation in both groups, intravenous nalbuphine 150 mcg/kg followed by 2mg/kg propofol over 15 seconds were injected. The LMA was inserted 60 seconds after completion of propofol injection after loss of consciousness and eye lash reflex. In case , eye lash reflex was still intact further boluses of 0.5mg/kg propofolwas used. Classic LMA was selected for patients according to their corresponding weights. All LMA insertions were doneusing method described by Dr. Archie Brain. Water based jelly will be applied on the posterior surface of the LMA and pressed along the hard plate using the index finger . It is finally pushed further down till resistance is felt. Cuff will be inflated with prescribed air in according to LMA size. Proper LMA placement will be confirmed with bilateral equally audible breath sounds, chest movements and capnography.The LMA insertion conditions shall be graded as acceptable providedno gagging, coughing or laryngospasm on first attempt of LMA insertion and unacceptable if there is gagging, coughing or larynogospasm that prevents ventilation on LMA insertion. LMA removed either by patient on full awakening or by the anaesthetist. Oxygen will be continued using facemask until full recovery and then the patient will be moved to PACU.

Data were fed and analyzed by using statistical software SPSS-version 10. Frequency and percentages were computed for the categorical variables like age groups, gender, ASA grades and condition of LMA insertion. Mean, standard deviation, 95% confidence interval, median with IQR were computed for quantitative variables like age and weight. Chi-Square test and fisher exact test was applied to observed rate of LMA insertion conditions between groups. Independent t-test and Mann Whitney test were used to compare mean difference between groups for age and weight. $P<0.05$ was considered significant.

RESULTS

All patients were randomly assigned to two groups, group I (intravenous lignocaine) and group T (topical lignocaine).

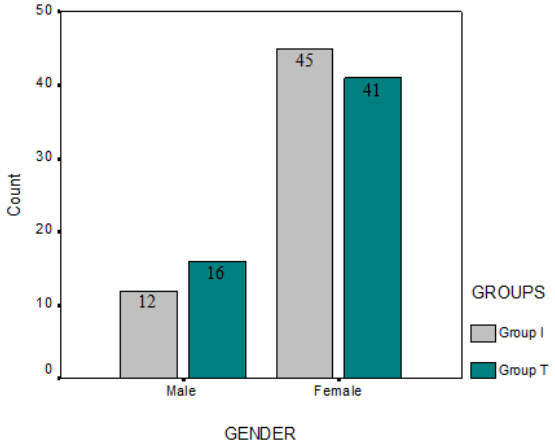

Figure No.1: Comparison of gender between groups

Males = 28(24.6%), Females = 86(75.4%) ;
Chi-Square= 0.75; P=0.38

Table No.1: Propofol and nalbuphine requirement

	Group I n=57	Group T n=57	P-Values
Total Propofol Dose (mg)	115.37±14.53	117.09±13.86	0.51
Nalbuphine Dose (mg)	8.65±1.09	8.77±1.04	0.52

Table No. 2: LMA insertion conditions between groups with respect to gender

LMA Insertion	Group I n=57	Group T n=57	Total n=114	
For Male (n=28)				
Acceptable	11(91.7%)	15(93.8%)	**26**(92.9%)	0.99
Unacceptable	1(8.3%)	1(6.3%)	**2**(7.1%)	
For Female (n=86)				
Acceptable	40(88.9%)	41(100%)	**81**(94.2%)	0.03
Unacceptable	5(11.1%)	0(0%)	**5**(5.8%)	

Table No. 3: LMA insertion conditions between groups with respect to age

LMA Insertion	Group I n=57	Group T n=57	Total n=114	
For Age Groups ≤ 30 (n=66)				
Acceptable	35(97.2%)	30(100%)	65(98.4%)	0.99
Unacceptable	1(2.8%)	0(0%)	1(1.5%)	
For Age Groups > 30 (n=48)				
Acceptable	16(76.2%)	26(96.3%)	42(87.5%)	0.04
Unacceptable	5(23.8%)	1(3.7%)	6(12.5%)	

Table No. 4: LMA insertion conditions between groups with respect to weight

LMA Insertion	Group I n=57	Group T n=57	Total n=114	
For Weight ≤ 60 (n=75)				
Acceptable	35(94.6%)	38(100%)	73(97.3%)	0.24
Unacceptable	2(5.4%)	0(0%)	2(2.7%)	
For Weight > 60 (n=39)				
Acceptable	16(80%)	18(94.7%)	34(87.2%)	0.34
Unacceptable	4(20%)	1(5.3%)	5(12.8%)	

The mean age in group I was 30+/- 9 years and in group T was 31+/- 10 years.ASA I patients were 47 in group I while 41 in group T. ASA II patients were 10 in group I while 16 in group T. There were 86 females of which 45 females in group I and 41 females in group T. (fig.1)LMA insertion was compared among 86 females who underwent breast surgeries. Acceptable conditions in group I were in 40 (90%) while 41 (100%) patients in T group. Immediate pharyngo-laryngeal complications were noted in 5patients(11.1%) in group I while none in group T patients. (tab.2) In patients less than 30 years (n=66), acceptable conditions in 35 patients (97%) in I group while 30 patients (100%) in T group while unacceptable in 1 patient in I group while none in T group. In more than 30 years, acceptable conditions in 16 patients (76%) in I group while 26 patients (96%) in T group, more complications in I group patients 5 (24%) while only 1 (4%) in group T ($p<0.04$). (tab.3) In patients more than 60 kilograms weight, acceptable conditions in 16 patients (80%) in group I while 18 patients (95%) in group T while unacceptable conditions in 4 patients (20%) in group I while in 1 patient (5%) in T group . ($p= 0.34$) (tab. 4).

DISCUSSION

Anaesthesiologists strive for a technique that provides optimal conditions for the surgery, no or minimal complications and early discharge from hospital settings. Endotracheal tube and LMA comparison showed major complications with size, cuff pressures, laryngoscope sizes, anaesthetic agents and airway reflexes attenuation. Decreased pharyngo-laryngeal complications were reported by P. Thapa[9] and colleagues using betamethasone gel for endotracheal tube intubation in comparison to lignocaine attributed to it'santi inflammatory effect and osmolality of jelly as a contributing factor for mucosal irritation[10]. In a study conducted by Sara R. and colleagues comparison of LMA supreme with endotracheal intubation made.[11] They have used muscle relaxant during induction. In all female breast surgery patients, they concluded reduced incidence of pharyngo-laryngeal complications with LMA usage.

Different drug combinations been used in the past to prevent pharyngo-laryngeal complications. 65% success reported by Wong CM and colleagues in a study experimenting combination of propofol and fentanyl.[12]Large doses of propofol failed to prevent pharyngo-laryngeal complications as observed by Kanzawa and team.[13]In a landmark study , Cook and colleagues reported ninety patients and compared two different intravenous lignocaine doses (0.5mg/kg and 1.5mg/kg) vs topical lignocaine 10% before thiopentone intravenous induction.[14] They reported success of 86% using topical lignocaine. Comparatively better airway reflex obtundation and deeper plane of anaesthesia by propofol as compared to thiopentone attributed for better results in our study. Propofol and nalbuphine synergistically induced a deeper plane ofanaesthesia which allowed better conditions for placement of laryngeal mask airway.[15]

Dental patients gagging observed to be reduced by using PC6 and CV24 points in acupuncture and is a point of future research in complications free airway management.[16]In our study we observed gagging in nine patients of I group while only in two patients of T group.($p=0.026$) This result is in line with the literature review that topical application alone may be insufficient to block gag reflex receptors at tongue base.[17] We tried to achieve this by spraying the solution near base of tongue and gargling but still can't abolish it completely.Bharati and colleagues reported 92% success in easy insertion of LMA with sufentanil , 88% with fentanyl and just 60% in lignocaine cases.[18]

Topical lignocaine 200 mg in our study in comparison to 40 mgas mostly reported in previous studies, is an effort to effectively block upper airway reflexesby spraying in area of base of tongue and posterior pharynx. Approximately, 4mg/kg topical lignocaine dose in our study is much lower than guidelines of British thoracic society of 8.2mg/kg and even Williams and colleagues used upto9mg/kg safely in another study.[19]Recommended maximum dose of 9mg/kg topical lignocaine for adults by World federation of societies of Anaesthesiologists.[20]In our study , after administration of topical lignocaine, we preoxygenated patients for three minutes so adequate penetration of local anesthetic into the airway mucosa for optimal desired effects. [21,22]

CONCLUSION

Topical 4% lignocaine application spray over base of tongue and posterior pharynx area reduces immediate pharyngo-laryngeal complications in day case female patients more effectively than 2% intravenous lignocaine without using any intravenous muscle relaxation agent. Improving patient comfort and readiness for early discharge in ambulatory surgeries may be attributed to this anaesthesia technique.

Author's Contribution:

Concept & Design of Study:	Muhammad Shazad
Drafting:	Syed Muhammad Nadeem
Data Analysis:	Syed Muhammad Nadeem
Revisiting Critically:	Muhammad Shazad, Syed Muhammad Nadeem
Final Approval of version:	Muhammad Shazad

Conflict of Interest: The study has no conflict of interest to declare by any author.

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