

A Comparison of Air Way Maintenance by Cuffed Oropharyngeal Air Way (COPA) and Laryngeal Mask Air Way (LMA) In Spontaneously Breathing Adult Patients

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In this study total hundred patients were included. Fifty (group I) were subjected to COPA device for airway maintenance and in other fifty (group II) LMA was used. In this study first attempt successful insertion rate in group I was 90% while in group II it was 94%. However statistical analysis showed no significant difference in both groups. Regarding maneuvers needed to maintain smooth breathing in group I head tilt was used in 2%. It is significantly high in group I than in group II. Laboured breathing was seen in 6% in group I while 2% in group II. There was no significant difference in both groups. According to this study LMA is better in all respect as it is easier to insert and better fit in.

Key words: LMA, COPA, spontaneously breathing.

The cuffed oropharyngeal airway (COPA) is a new supraglottic airway device that was first described by Greenberg and Young in 1992. The device is a modified Guedel airway with an inflatable distal cuff and a proximal connector for attachment to the anaesthesia breathing system. The cuffed oropharyngeal airway (COPA) was designed to, elevate the epiglottis and form an air tight seal in laryngopharynx^{1,2,3}. Like laryngeal mask airway it is intended primarily for use in spontaneously breathing patients who are not at risk of aspiration of gastric contents⁴. Laryngeal mask airway (LMA) was first conceived by Brain who reported it in the use of a prototype in 1983⁵. Since then it has become a very popular mean of airway control^{6,7} and is strongly recommended way of airway maintenance in spontaneously breathing patients undergoing day stay surgery^{8,9}. The LMA is best suited for elective surgical procedures, where face masks are currently used. LMA is not indicated for use as a replacement of endo tracheal tube.

Objectives: To find out the efficacy of cuffed oropharyngeal airway in maintaining airway and breathing during anaesthesia as an alternative to laryngeal mask airway.

Patients and methods:

This observational comparative study was based on findings observed in 100 patients, aged 20 to 40 years. Subjects were divided into two groups I and II each comprising n=50. In group I cuffed oropharyngeal airway was used while in group II airway and breathing were maintained by laryngeal mask airway. Study was carried out at Service Hospital, Lahore from Jan. 2001 to Aug. 2002.

Inclusion criteria:

1. Patients between 20 and 40 years age.
2. Patients having status I and II as per American Society of anesthesiologist grading.

3. Elective Surgical procedure ranging upto 40 minutes and performed without using muscle relaxants.

Exclusion criteria:

1. Patients with risk of aspiration of gastric contents.
2. Patients having ASA III and more.
3. Obese patients.
4. Asthmatics.
5. Patients with oropharyngeal pathology.

After having informed written consent, the patients were examined in detail for pre-operative assessment and preparation. After taking intravenous line the subjects were premedicated with 0.01 mg/kg Midazolam Inj. By intravenous route half an hour before surgery. In the operation theater monitors for SpO₂, Electrocardiography & blood pressure were applied. Inj. Nalbuphine 0.1 mg/kg was administered I/V prior to induction of anaesthesia.

Anaesthesia was induced by propofol 1%, 2 mg/kg I/V administered in 5ml increments while observing pulse rate and loss of consciousness. After the full dose was injected, cuffed oropharyngeal airway was inserted in group I and laryngeal mask airway in group II using specific techniques and their cuffs were inflated with recommended quantity of air. 25-35 ml for COPA and 20-30 ml for LMA.

Anesthesia was maintained using mixture of oxygen 33% and nitrous oxide 66% with incremental doses of propofol administered on lightening of anesthesia as observed by rise in heart rate and respiratory rate. Each incremental dose was 20mg (2 ml) of propofol.

Results:

In this study total hundred patients were included. Fifty (group I) were subjected to COPA device for airway maintenance and in other fifty (group II) LMA was used. Out of 100 cases sixty patients were female and forty were male. Male to female ratio was 2:3. Age for group I was 21-40 years with mean age of 30.88 ± 5.78 while for group II age was 20-40 years with mean age 29.40 ± 6.43.

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Table 1: Successful insertion

	1 st attempt	2 nd attempt	Total
Group I (COPA)	45	5	50
Group II (LMA)	47	3	50
Statistical analysis:			
X ²	0.543	0.543	
Df	1	1	
P	0.357	0.357	

In this study first attempt successful insertion rate was compared between group I (COPA) and group II (LMA). In group I forty five cases had first attempt successful Insertion i.e. success rate was ninety percent, while in group II 47 cases had successful 1st attempt insertion so it is 94% (Table 1). However statistical analysis showed no significant difference in successful insertion on 1st attempt in both groups (P =0.357).

Table 2: Incidence of maneuvers needed during the procedure to maintain smooth breathing and SaO₂.

	Head Tilt	Jaw Lift	Intervention with Cuff	Total
Group I	7	4	2	13
Group II	1	0	1	2
Statistical analysis:				
X ²	4.891	4.167	0.344	
Df	1	1	1	
P	0.030	0.59	0.500	

Regarding manoeuvres needed to maintain smooth breathing in group I head tilt was used in seven cases out of fifty i.e. two percent needed head tilt. The rate is significantly high in group I than in group II and statistics analysis difference is significant (P =0.030).

Table 3: Incidence of laboured breathing and changes in SaO₂.

Group I	3
Group II	1
Total	4
Statistical analysis:	
X ²	1.042
Df	1
P	0.309

Laboured breathing was seen in both groups. In group I out of fifty cases three cases i.e. six percent had laboured breathing while group II had one case i.e. two percent. There was no significant difference in incidence of laboured breathing in group I and group II statistically (P =0.309) (Table 3).

Table 4: Complications incidence.

	Sore Throat	Blood Staining on Device	Throat Pain	Total
Group I	3	2	1	6
Group II	2	4	1	7
Statistical analysis:				
X ²	211	0.709	0000	
Df	1	1	1	
P	0.500	0.339	0.753	

Sore throat was noted in both groups post-operatively. In group I out of fifty cases , three cases i.e. six percent had sore throat while in group II out of fifty cases two i.e. four percent had sore throat. There was no significant statistical difference in both groups (P =0.500).

In group I out of fifty cases throat pain was seen in one case i.e. two percent while in group II, it was also two percent i.e. there was no significant difference in two groups regarding throat pain (P =0.753) (Table 4).

Discussion:

LMA and COPA both devices are being used as an alternative to face mask during spontaneously breathing patients under anesthesia. This observational comparative study was carried out in 100 patients divided in two groups I and II each having n=50. In group I COPA while in group II LMA was used to maintain airway and breathing. Male to female ratio was 2:3. Mean age of COPA group was 30.88 ± 5.78 while for LMA group it was 29.40 ± 6.43.

During this study COPA and LMA were compared for ease of insertion, interventional requirements during the procedure and any intra-operative, or post-operative adverse effects.

Results of study showed that in group I (COPA) 90% of the subjects had success insertion of device on first attempt while this was 94% for group II (LMA). This observation is in confirmation of the previous study done by Greenberg and Bert-A. Where they found 90% successful insertion on first attempt in LMA group while 80% in COPA group.

Another study conducted by brimecombe JR and bromacob JC showed LMA had a more frequent success rate than COPA 97% vs 55%¹⁰.

This may be because LMA is soft in consistency and can be inserted easily while COPA is hard in consistency and difficult to insert.

A prospective study by Push and Wilding showed that a patent airway can be maintained by either device in all patients. Global first time success rate for insertion was similar in both LMA and COPA¹¹.

This study revealed that COPA group needed more interventions to maintain smooth breathing as the head tilt was used in 14% patients in group I. Jaw lift was used in 8% cases and cuff volume adjustment was used in 4% cases. Similar maneuvers in LMA group were 2%, 2% and 2% respectively.

These observations were also made by others in previous studies as Asia-T Koga-K using COPA in 100 patients where they used adjustments of head, neck and jaw in 30% of cases¹².

Bouffer-E Maslowski-D in his study of using COPA assessed its performance and found, jaw thrust was need in 70% of patients for successful insertion¹³.

Incidence of off and on laboured breathing was 6% in COPA group and 2% in LMA group. More frequent

observation of labored breathing, intervention to maintain smooth respiration in COPA group may be because this airway remains in the oral cavity while LMA goes into the larynx where it settles down more firmly.

Regarding intra-operative adverse events no case of bronchospasm, cyanosis, regurgitation or breath holding was noted in both groups ($P > 0.5$). This is in confirmation of the previous studies of Brimcombe-JR and Brimcombe-JC which also revealed no case of bronchospams, regurgitation, breath holding or cyanosis¹⁴. Similar findings were given by Asia-T. This is because both devices are used in elective procedures, both can maintain airway effectively in spontaneously breathing patients¹².

No case of injury to teeth and lips was noted in this study, however blood staining was found on the device in both groups almost in equal ratio. This was due to some scratch on mucosa of oropharynx.

Post-operative complications like sore throat, pain in throat, cough and hoarseness were studied. Few cases of sore throat and pain were noted in both groups almost in same ratio and no statistical difference was noted.

Brimcombe-JR, Brimcombe-JC showed more late postoperative sore throat 14% vs. 36% and more jaw and neck. Pain 12% vs. 26% in patients managed with COPA. This study demonstrates that LMA offers advantages over the COPA in most technical aspects of airway management and in term of post-operative morbidity¹⁴.

Conclusion:

On the basis of results and discussion we can conclude the following;

1. Both COPA and LMA can be effectively used to maintain airway in short surgical procedures.

2. LMA is better device in all aspects as it is easier to insert and better fits in.

References:

1. Brimacombe JR, Brimacombe JC, Morris R, Mecklem D, Clarke G, Barry J, Kirk T. A comparison of the laryngeal mask airway and cuffed oropharyngeal airway in anaesthetized adult patients. *Anaesth Analg* 1998; 87:147-52.
2. Ezri T, Ady N, Szmuk P, Glanz L, Shklar B, Katz J, Geva D. Use of cuffed oropharyngeal vs laryngeal mask airway in elderly patients. *Can J Anaesth* 1999; 46: 363-367.
3. Pusch F, Wildling E, Freitag H, Goll V, Hoerauf K, Weinstable C. A prospective randomized trial comparing the cuffed oropharyngeal airway (COPA) with the laryngeal mask for elective minor surgery in female patients. *Wein Klin Wochenschr* 2001; 113: 33-37.
4. Shoichi U, Takahisa G, Yoshinori N, Fumito I, Yosinari N, Shigeo M. The cuffed oropharyngeal airway, a novel adjunct to the management of difficult airway. *Anesthesiology* 1998; 88: 1677-9.
5. Brain AJ. The laryngeal mask: a new concept in airway management. *Br J Anesth* 1983; 55: 801-5.
6. Pennat JH, White PF. The laryngeal mask airway its uses in anesthesiology. *Anesthesiology* 1993; 79: 143-63.
7. Brimacombe J. Analysis of 1500 laryngeal mask, used by one anesthetist in adults undergoing routine anesthesia. *Anesthesia* 1996; 51: 76-80.
8. Smith J, Toshi G. The laryngeal mask airway for out patients anesthesia. *J Clin Anesth* 1993; 5: 22-8.
9. Amjad N. use of laryngeal mask and endotracheal tube-a comparison for ambulatory surgery. *JCPSP* 2001; 11: 127-130.
10. Greenberg RS, Brimacombe J. A randomized controlled trial comparing the COPA and LMA in spontaneously breathing anesthetized adults. *Anesthesiology* 1998; 88: 970-7.
11. Push F, Wildling E. A prospective randomized trial comparing the COPA with LMA for electric minor surgery. *Wein Klin Wochenschr* 2001; 113: 33-7.
12. Asai T, Koga K, Jones RM. The cuffed oropharyngeal airway: its clinical use in 100 patients. *Anaesthesia* 1998; 53: 817-22.
13. Boufflers E, Maslowski D. The clinical use of cuffed oropharyngeal airway. *Ann Fr Anaesth Reanim* 1998; 17: 206-9.
14. Brimacombe JR, Brimacombe JC. A comparison of LMA and COPA in anesthetized adult patients. *Anesthesia Analgesia* 1998; 87.