RANDOMIZED CROSS-OVER COMPARISON OF AMBU LARYNGEAL MASK AIRWAY WITH CLASSIC LARYNGEAL MASK AIRWAY DURING ANAESTHESIA WITH CONTROLLED VENTILATION.

I Shariffuddin MBChB; C Y Wang MBChB, FRCA
Department of Anaesthesia, University Malaya Medical Centre, Malaysia.

Introduction

There is a potential risk with prion disease such as variant Creutzfeldt-Jakob disease associated with the use of reusable airway equipment. This has led to an increase in disposable airway equipment in the market including laryngeal mask. The aim of this study was to compare the performances of Classic Laryngeal mask airway (Classic LMA) and single use ambu LMA during controlled anaesthesia . The primary outcome measured was oropharyngeal leak pressure(OLP) and the secondary outcome measures include insertion time and success rate, manipulations required to achieve a patent airway, grade of fibre optic laryngoscopy and the quality of ventilation during anaesthesia.

Material and methods

With institutional approval and patient consent, 40 patients were studied using a randomised cross- over design. Following standardised induction of general anaesthesia with fentanyl, propofol and muscle relaxant, the patients had ambu LMA and classic LMA inserted by a single anaesthetist.

An independent observer assessed the insertion times and number of attempts. Patients were ventilated with oxygen-air mixture with tidal volumes of 7 ml/kg and rate of 12 -15 /min. The OLP was measured with cuff pressures adjusted to 60 cmH_2O. Devices were inspected for traces of blood after removal.

Statistical analysis: The paired test were used to compare OLP, leak fraction, leak volume and peak airway pressure. Chi-squared test was used to compare the number of attempts at insertion and incidence of trauma with each device. Wilcoxon rank test was used to compare insertion time.

Results and Discussion

In this study, we have shown that Ambu LMA has a greater mean OLP as compared to the Classic LMA [Table 2].

The leak fractions and leak volumes with the Ambu LMA was significantly less than classic LMA ($p<0.05$; $p<0.05$ respectively). Despite these differences, there were no difference in gas exchange in term of SpO_2 and $ETCO_2$. Insertion time was similar between the classic LMA and the ambu LMA. [Table 3]

Although the number of insertion attempts were significantly less than the classic LMA ($p<0.05$), there was 1 failure of insertion with the ambu LMA and none in the classic LMA .The classic LMA required less manipulations to achieve a patent airway during induction ($p<0.05$) [Table 3]. However during maintenance of anaesthesia the quality of ventilations were similar in both groups. The incidence of trauma and grade of fibre-optic view and mean PAP were similar in both groups

Summary

The ambu LMA was as effective as the classic LMA as a supra glottic airway device during anaesthesia with controlled ventilation. It also provides better seal pressure

Acknowledgements

We would like to thank the Ambu LMA Malaysia for providing the Ambu LMA. I would also wish to acknowledge the kind support of sisters and staff nurses of the Day Care Surgery, UMMC.

Fig .1

Table 1. Demographic data Data are mean ± sd or n

Variable	Group Ambu/Classic
Male:Female	14:26
Age (years)	35.78 ± 10.34
Weight (kg)	56.23 ± 10.57
Height (cm)	159.55 ± 7.80

Table 2. Oropharyngeal leak, anatomic position and mucosal injury. Data are mean ± SD or *n ;*P Value < 0.05*

Variables	Ambu	Classic	P Value
Oropharyngeal leak pressure testing (OLP):			
Pressure (cm H_2O)	19.18± 7.54	15.28± 5.24	*p=0.004
Anatomic position:			
Airway tube (4/3/2/1)	3/15/18/3	3/18/11/7	P=0.801
Mucosal Injury Y/N	4/15	6/13	P=0.461

Table 3. Ease of insertion and positive pressure ventilation Data are mean ± SD or *n ;*P Value < 0.05*

Variables	Ambu LMA	Classic LMA	P- Value
Ease of insertion:			
Insertion time (s)	27.738 ±7.95	27.972 ±10.45	P=0.764
Number of attempts (1/2/failed)	39/0/1	35/5/0	*P=0.045
Positive pressure ventilation:			
Peak airway pressure (cmH_2O)	14.95 ± 3.12	14.61 ± 2.45	P=0.394
Leak volume (ml)	15.93 ± 41.75	36.59 ± 68.19	*P=0.054
Leak Fraction (%)	3.690 ± 9.120	9.295 ± 16.774	*P=0.041
SpO2 (%)	99.0 ± 0.9	99.1 ± 1.2	
Leaks detectable (Y/N):			
Mouth	10/29	9/30	P=0.792