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Original Research Article

COMPARATIVE STUDY OF HEMODYNAMIC RESPONSE USING LARYNGEAL MASK AIRWAY (LMA) VERSUS ENDOTRACHEAL TUBE (ETT) IN CONTROLLED HYPERTENSION PATIENTS

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Abstract: *In the practical conduct of Anaesthesia, Airway management is crucial to the outcome & best patient care. A total of n=114 patients,30-50 yrs with mean age 38.736± 4.36 years; 57 each group of Laryngoscopy and ETT; and LMA group undergoing elective surgery of 30 minutes to 01-hour duration in controlled hypertensives were included in the study. The hemodynamic response was noted, recording pulse rate, Systolic BP, Diastolic BP, and MAP immediately after 1,3,5 minute of laryngoscopy & intubation or LMA insertion. The study results showed a hemodynamic response of 59.6% in patients of the Laryngoscopy & ETT group compared to 40.4% in the LMA group. The study revealed attenuated hemodynamic response to LMA insertion with improved hemodynamic; stability compared to laryngoscopy & intubation. The results advocate using supraglottic airway devices, especially LMA merits, in selected patients & circumstances.*

Keywords: Haemodynamic response, LMA, Laryngoscopy, and Endotracheal intubation.

Introduction

Airway management is of utmost importance towards safe Anaesthesia; thus, traditionally, laryngoscopy and ETT have been the mainstay in protecting, maintaining, and guaranteeing the airway (Bajwa and Bajwa, 2013; Becker et al., 2014; Law et al., 2013). Conversely, laryngoscopy & ETT is not without complications during laryngoscopy; intubation and extubating; hypertension; laryngospasm; airway edema & narrowing with increased airway resistance & negative pressure pulmonary edema (Vandse et al., 2012). The LMA offers a much less invasive way of maintaining the airway, not requiring laryngoscopy & placed over the glottis instead of passing through the glottis. LMA goes about as a middle between the Laryngoscopy/ETT, and the oropharyngeal aviation route offers a portion of the benefits of endotracheal intubation while outperforming the detriments like the feeling of laryngopharyngeal and cardiovascular/Haemodynamic reflex reaction (Jarineshin et al., 2015; Lee et al., 2012). Laryngoscopy & tracheal intubation or LMA insertion are noxious stimuli provoking a transient but marked sympathetic response manifesting as tachycardia and hypertension (Jarineshin et al., 2015). There are a number of ways to blunt these hemodynamic changes avoiding laryngoscopy; intravenous narcotics; vasodilators; lidocaine, or beta-blockers, but mostly with variable results. LMA insertion involves less mechanical manipulation of the airway than laryngoscopy & ETT, with greater advantage in selected patients; however, it has its limitations and is contraindicated in patients with a risk of aspiration, low pulmonary compliance, or pharyngeal obstruction. Because of the historical reviews number of researchers have conducted studies on LMA insertion, and Kiran et al. have shown a Haemodynamic response of 59.2% in the Endotracheal tube group versus 36% in the LMA group (Chopra et al., 2017; Kannan, 2007; Natalini et al., 2003).

In our general public practice, Laryngoscopy and ETT have been the principal technique with their chaperone entanglements of animating the cardiovascular reflexes and their weighty pernicious impacts in cardiovascular or cerebrovascular compromised patients. The LMA isn't regularly utilized in that frame of mind for a similar reason; it has been displayed to have constructive outcomes in our populaces concerning hemodynamic changes and

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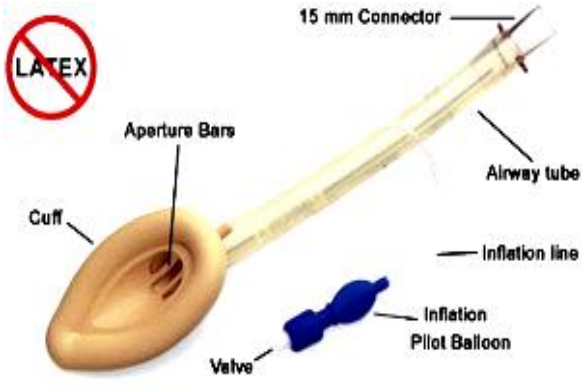
the simplicity of inclusion and acknowledgment; (Brain and Verghese, 2003; Keller and Brimacombe, 2000; O'Connor Jr et al., 2002; Stix and O'Connor Jr, 2003) this being the aim of the present study of LMA use in controlled hypertensive to pave the way for further researchers.

Methodology

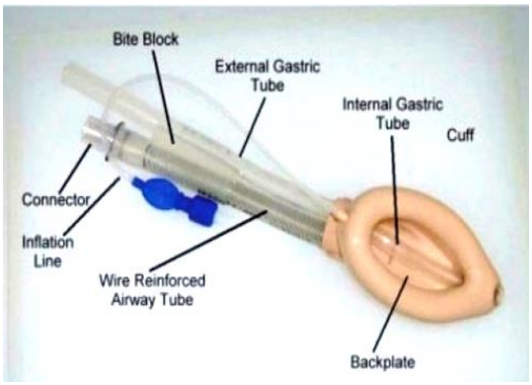
A randomized controlled trial study was conducted in a total of n=114 patients, with n1=57 patients in the Endotracheal group and n2=57 patients in the proseal LMA group (Brain and Verghese, 2003; Keller and Brimacombe, 2000; O'Connor Jr et al., 2002; Stix and O'Connor Jr, 2003) in Anaesthesia department Maqsood Medical Complex Peshawar from 01 July 2022 to 31 December 2022 duly supervised by the HOD.

Controlled hypertensives patients of more than six months controlled on anti-hypertensive agents with BP≤ 120/80 mm Hg per record, and efficacy defined as systolic, diastolic blood pressure ≤ 120/80mm Hg after 05 minutes of ETT and or LMA insertion patient undergoing elective surgery in supine position of 30 minutes to 01-hour duration; age 30-50 years both genders controlled hypertensives were included & those belonging to ASA III-IV; emergency, difficult airway or intubation; risk of aspiration, poor lung compliance; pregnant; Diabetics or endocrine disorder or refused consent were excluded.

After pre-medication of Inj Midazolam 0.03-0.05 mg I/V 5 minutes before induction, subjects were randomly blind balloted n=57 for each group ETT and LMA equally; size4 laryngeal mask airway used in all LMA group. After the baseline values of heart rate; SPO2; non-invasive systolic, diastolic, and MAP recorded; preoxygenation; thiopentone sodium 2.5% 5mg/kg I/V, succinylcholine 2mg/kg I/V; and disappearance of fasciculations ETT or LMA were inserted (figure) using the standard techniques; Anaesthesia maintained with IPPV; O2 6L/mt and isoflurane as the inhalational agent. Data analysis with frequency and percentage computed for qualitative and quantitative variables; mean±; SD, as shown in tables Chi-square test, applied to compare the good haemodynamic response in both groups with P≤ 0.05 as satisfactorily significant.



Laryngeal Mask Airway



Results

Table 1 shows the mean age, duration of hypertension, and BMI in both the ETT and LMA groups; the majority of patients are 30-40 years in both groups, male gender, and all patients had ASA II (Table II). The hemodynamic response was seen in 59.6 % of the Laryngoscopy and ETT groups compared to the Laryngeal mask group of 40.4 % (p=0.03) of the attenuated scale (Figure 1). Stratification of the good hemodynamic response in both groups concerning age, gender, ASA score, duration of hypertension, and BMI are shown in Table III, respectively.

TABLE-I: Distribution of patients according to age, duration of hypertension, and BMI in both groups.

Demographics	Mean±SD Endotracheal tube group (n=57)	Mean±SD Laryngeal mask airway group (n=57)
Age (Years)	38.736 ± 4.36	38.350 ± 3.62
Duration of hypertension (months)	29.298±14.01	34.140±14.71
BMI (kg/m2)	24.312±1.78	24.238±1.78

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TABLE-II.: Frequency and percentage of different variables in both groups.

		n=57	n=57
		Endotracheal tube group	Laryngeal mask airway group
Age Groups	30-40	38 (66.7%)	37(64.9%)
	41-50	19 (33.3.%)	20 (35.1%)
Genders	Male	38 (66.7%)	42 (73.7%)
	Female	19 (33.3.%)	15 (26.3%)
ASA Score	I	0 (0 %)	0 (0 %)
	II	57 (100%)	57 (100%)

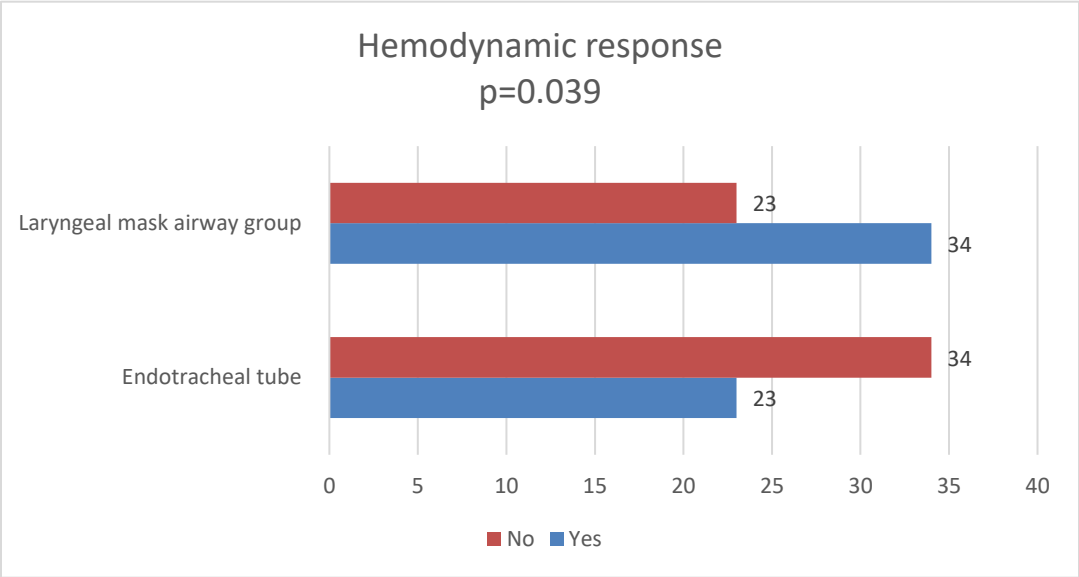

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Figure 1 Comparison of the hemodynamic response in both groups.

Table III: Stratification of hemodynamic response with different variables

Variables	Constructs	Endotracheal tube		Laryngeal mask airway		P-value
		Yes	No	Yes	No	
age group	30-40 years	14 (36.8%)	24(63.2%)	23 (62.2%)	14 (37.8%)	0.028
	41-50 years	9 (47.4%)	10(52.6%)	11 (55%)	9(45%)	0.633
Gender	Male	14 (36.8%)	24(63.2%)	24 (57.1%)	18 (42.9%)	0.069
	Female	9 (47.4%)	10(52.6%)	11 (55%)	9(45%)	0.260
ASA	I	0(0%)	0(0%)	0(0%)	0 (0%)	1.000
	II	23(40.4%)	34(59.6%)	34(59.6%)	23(40.4%)	0.039
Months	7-24 months	10(37%)	17(63%)	12(57.1%)	9(42.9%)	0.165
	>24 months	13(43.3%)	17(56.7%)	22(61.1%)	14(38.9%)	0.149
BMI	≤ 25 kg/m2	16(40%)	24(60%)	27(65.9%)	14(34.1%)	0.019
	>25 kg/m2	7(41.2%)	10(58.8%)	7(43.8%)	9(56.2%)	0.881

Discussion

Laryngoscopy and Endotracheal intubation though most widely accepted, it's associated with known airway stimulation, hemodynamic and cardiovascular response leading to tachycardia; hypertension and arrhythmias may trigger harmful deleterious effects in vulnerable hypertensive ischemic heart or cerebrovascular disease. The LMA being basic in the plan, simplicity of addition, and where worries about the hemodynamic reaction exist, offer a portion of the upsides of intubation while staying away from its crucial hindrances, ends up being a well-known expansion acquiring an uncompromising stance in sedation practice (Braun et al., 2002; Brimacombe, 2005; Evans et al., 2002; Fujii et al., 1995; Wilson et

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al., 1992). There was no distinction in the standard upsides of hemodynamic factors between the two gatherings. In our review, the pulse expanded after acceptance and again after endotracheal intubation or the addition of LMA. These outcomes were the same as those of comparable concentrate by Yoshitaka Fujii (Fujii et al., 1995) and partners, who found that the hemodynamic changes were more noteworthy after intubation than after laryngeal cover aviation route inclusion. There was a fall in both systolic and diastolic BP after enlistment in both the gatherings of our review. This was trailed by a profoundly huge systolic and diastolic BP expansion after aviation route instrumentation in both gatherings. Anyway, the qualities in bunch LMA were fundamentally lower contrasted with bunch ETT, following 1, 3, and 5 minutes. This mirrored a more modest level of complete afferent excitement in bunch LMA and proceeded with the impact of the tracheal cylinder. The consequences of our review support the discoveries of Wilson et al. 18. Those who found that adding laryngeal cover aviation route produces a small expansion in both systolic and diastolic blood vessel pressure.

Nonetheless, this increment was extensive to a lesser extent, thus, in examination related to laryngoscopy and tracheal intubation. Like our review results, Hickey et al. (Hickey et al., 1990) and other studies (Bhattacharya et al., 2008; Fujii et al., 1995; Hickey et al., 1990; Shribman et al., 1987; Wilson et al., 1992) discovered that adding LMA was related to critical expansion in blood vessel strain and pulse; however, the progressions were brief. In our review, including LMA was related to a less hemodynamic reaction contrasted with endotracheal intubation. Shribman (Shribman et al., 1987) and partners inferred that the feeling of the supraglottic area by tissue strain is the significant reason for the sympathoadrenal reaction. In any case, the fleeting idea of this reaction in bunch LMA was made sense of by Major et al. (Marjot, 1993), who found that sidelong tension of the LMA sleeve on the pharyngeal mucosa was not a supported one and the way that communicated pressure diminished during the timing cover was in situ. Concentrates by Siddiqui NT et al. (Siddiqui and Khan, 2007) and Bharti N et al. (Bharti et al., 2008) found a lessened hemodynamic reaction after including the laryngeal cover aviation route contrasted with endotracheal intubation. Our review's mean blood vessel pressure (Guide) values expanded after tracheal intubation or the addition of LMA. Like other hemodynamic factors, the Guide in bunch LMA was fundamentally lower than bunch ETT. Our outcomes recommend that the addition of LMA is related to lessened haemodynamic reaction contrasted with tracheal intubation and might be valuable in circumstances where the pressure reaction to intubation ought to be avoided, as in hypertensive states.

Conclusion

The present study concludes that the hemodynamic reaction to laryngeal veil addition is greater than that of laryngoscopy and endotracheal intubation. Hemodynamic reaction to laryngeal veil inclusion is transient. No inappropriate episodes with aviation route the executives by laryngeal cover aviation route. Laryngeal cover aviation route might be utilized for aviation route the board during sedation in hypertensive patients on treatment whose pressor reaction would be harmful.

Conflict of interest

The authors declared the absence of a conflict of interest.

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