LETTER TO EDITOR

Comparison between responses following use of fentanyl on heart rate and mean arterial pressure during endotracheal intubation and laryngeal mask airway insertion

Dear Editor,

Hemodynamic responses to intubation and laryngoscopy may have deleterious effects [1-3] and measures to minimize them are necessary. The present study was conducted to observe the heart rate and mean arterial pressure following laryngeal mask airway (LMA) insertion and endotracheal intubation after administration of fentanyl.

A total of 68 patients in the age group between 20 and 45 years, of either sex, belonging to American Society of Anesthesiologists physical Status I or II and Mallampati Grade I [4], scheduled for various elective surgical procedures with likely duration of not more than 30-45 min, were selected for this pilot project. The study was carried out in a time span of 3 months and all patients who came to us and met the inclusion criteria were included for the study. Patients with a history of cardiovascular, gastroesophageal reflux and respiratory diseases, those on cardioactive drugs, diabetics and pregnant women were excluded. Institutional ethical clearance was taken before the commencement of the study and informed consent of the subjects were obtained.

Heart rate, blood pressure, electrocardiogram and oxygen saturation were serially recorded. The patients were divided randomly into two groups, comprising of 34 patients in each group (Group A and B). After securing intravenous access, the patients in both groups were given injection fentanyl 1-2 μg/kg intravenously, 4-5 min before induction of anesthesia. After preoxygenation, patients received injection thiopentone sodium (2.5%) intravenously at around 3-4 mg/kg. Neuromuscular blockade was achieved by injection atracurium besylate 0.5 mg/kg. Patients were then ventilated with 100% oxygen for about 4 min. Subsequently, tracheal intubation was done in patients of Group A, whereas LMA was inserted blindly in patients of Group B. Statistical analysis was performed using paired *t*-test (for pre-operative values and the values at different time intervals) and unpaired *t*-test (for different values between Group A and B).

In Group A and B, there was a significant rise in heart rate immediately before and 1 min after airway instrumentation [Tables 1 and 2], while in Group B this rise, significantly lasted until 3 min. Heart rate in Group A was significantly lower than B at 3 and 5 min post airway

Table 1: Heart rates (beats/min) in group A and B and its comparison at different points of time

Group	Mean (SD)					
	Immediate pre-operative baseline value	Immediately before airway instrumentation	After airway instrumentation			
			1 min	2 min	3 min	5 min
Group A	78.38 (11.40)	80.09 (11.00)	99.74 (12.50)	86.71 (11.81)	78.06 (10.48)	74.03 (10.66)
P value (paired *t*-test)		<0.05*	<0.001**	<0.001**	>0.05	<0.001**
Group B	78.59 (9.76)	81.24 (8.99)	97.85 (9.87)	88.3 (8.76)	83.00 (8.37)	80.03 (8.39)
P value (paired *t*-test)		<0.001**	<0.001**	<0.001**	<0.001**	>0.05
P value (unpaired *t* test)	>0.05	>0.05	>0.05	>0.05	<0.05*	<0.05*

SD: Standard deviation. *P<0.05 was considered as statistically significant and **P<0.01 as highly significant

Table 2: MAP (mmHg) in group A and B and its comparisons at different points of time

Group	Mean (SD)					
	Immediate pre-operative baseline value	Immediately before airway instrumentation	After airway instrumentation			
			1 min	2 min	3 min	5 min
Group A	93.47 (9.85)	86.56 (9.68)	119.74 (7.99)	102.41 (8.70)	94.56 (8.84)	91.94 (6.84)
P value (paired *t* test)		<0.001**	<0.001**	<0.001	>0.05	>0.05
Group B	93.88 (8.88)	85.53 (8.32)	111.03 (7.34)	98.56 (16.64)	95.89 (6.80)	92.24 (6.27)
P value (paired *t* test)		<0.001**	<0.001**	>0.05	>0.05	>0.05
P value (unpaired *t* test)	>0.05	>0.05	<0.001**	>0.05	>0.05	>0.05

MAP: Mean arterial pressure, SD: Standard deviation. *P<0.05 was considered as statistically significant and **P<0.01 as highly significant

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instrumentation. There was a significant rise in mean arterial pressure (MAP) in both groups following airway instrumentation at 1 min. In Group A, MAP was significantly higher at 1 min following airway instrumentation when compared to Group B [Table 2].

The use of a LMA was associated with a truncated response of hemodynamic parameters when compared with endotracheal intubation in the present study. This is similar to the findings of Bukhari et. al. [1] and Joad et. al. [2] There was a significant difference in mean arterial blood pressure at 1 min post airway instrumentation among the two groups. The shorter duration of the rise in blood pressure in both groups when compared to previous studies [1,2] could be due to the use of fentanyl in this study. A similar result was also noticed with the use of fentanyl by Zhang et. al. in 2009 [3]. Jamil et. al. in 2009 [4] suggested LMA as a suitable alternative to endotracheal intubation for positive pressure ventilation in children.

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Authors' Contributions

Concept, design, intellectual content, clinical studies, data acquisition: Satrajit Dawn, Arunima Chaudhuri, Debashis Saha, Sumanta Ghosh Maulik. Experimental studies: Satrajit Dawn, Arunima Chaudhuri, Debashis Saha, Sumanta Ghosh Maulik. Literature search, Data analysis, statistical analysis, manuscript preparation, manuscript editing, and manuscript review: Satrajit Dawn, Arunima Chaudhuri, Debashis Saha, Sumanta Ghosh Maulik.

Competing Interests

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