



COMPARISON OF FENTANYL AND BUTORPHANOL IN ATTENUATING THE HAEMODYNAMIC RESPONSES TO LARYNGOSCOPY AND ENDOTRACHEAL INTUBATION

Anaesthesiology

Dr. Rohit Tanwar	Assistant Professor, Department Of Anaesthesia, Sgt Medical College, Gurugram, Haryana.
Dr. Manjit Tanwar	Associate Professor, Department Of Surgery, Sgt Medical College, Gurugram, Haryana.
Dr. Tarun Gupta	Assistant Professor , General Surgery , Sgt Medical College, Gurugram, Haryana.
Dr. Rudrax Bhatt	Junior Resident, Department Of Surgery, Sgt Medical College, Gurugram, Haryana.

ABSTRACT

Introduction: Laryngoscopy and intubation of the tracheal tube are noxious stimuli and changes in haemodynamics are attributed to the stimulation of epipharyngeal and parapharyngeal region. These changes are manifested as rise in heart rate and blood pressure which are variable, transient and unpredictable. **Method:** A double-blind randomised trial comparing the haemodynamic effects of two opioid drugs, Fentanyl and Butorphanol. 60 patients divided into two group. Group B- Inj. Butorphanol 40 µg/kg IV. Group F - Inj. Fentanyl 2 µg/kg IV. Is administered 5 minutes before Laryngoscopy Intubation. **Results:** Even in well-anaesthetised individuals, reflex tachycardia and hypertension on laryngoscopy and intubation occurs quite frequently. The study was done on the focus to search for a better haemodynamic response so that patients compliance will be better with less side effects. **Conclusion:** With this study we conclude that the administration of intravenous butorphanol prior to induction of anaesthesia helps on better attenuation of the haemodynamic response to laryngoscopy and endotracheal intubation than intravenous fentanyl.

KEYWORDS

INTRODUCTION

- Laryngoscopy and intubation of the tracheal tube are noxious stimuli and changes in haemodynamics are attributed to the stimulation of epipharyngeal and parapharyngeal region. These changes are manifested as rise in heart rate and blood pressure which are variable, transient and unpredictable.
- Fentanyl is a synthetic pure μ -receptor agonist with shorter time to peak analgesic effect, larger safety margin, minimal respiratory depression at analgesic doses. Fentanyl brings hemodynamic stability perioperatively by its action on cardiovascular system and autonomic regulatory areas. It results in decrease in sympathetic tone and increase in parasympathetic tone. Fentanyl blunts hemodynamic response to laryngoscopy and endotracheal intubation.
- Butorphanol is an agonist-antagonist opioid, an agonist at K-receptors. Its activity at μ -receptors is either antagonistic or partially agonistic. It is five to eight times as potent as morphine and is available only in parenteral form, whereas the duration of action of butorphanol is similar to that of morphine.
- The two drugs fentanyl and butorphanol were compared in their efficiency in attenuating the pressor response to laryngoscopy and endotracheal intubation in terms of their effect on heart rate, systolic BP, diastolic BP.

MATERIAL AND METHODS

A double-blind randomised trial comparing the haemodynamic effects of two opioid drugs, Fentanyl and Butorphanol. 60 patients divided into two group. Group B- Inj. Butorphanol 40 µg/kg IV. Group F - Inj. Fentanyl 2 µg/kg IV. Is administered 5 minutes before Laryngoscopy and Intubation.

Haemodynamic parameters were recorded for up to 10 minutes after endotracheal intubation.

Heart rate, BP (systolic, diastolic) were recorded at the first, second, third, fourth, fifth and tenth minute following intubation and was noted as T1, T2, T3, T4, T5 and T10 respectively. No surgical stimulation was allowed for the first 10 minutes after intubation.

Statistics

We used SPSS 22 software for all analysis. We analysed variants association of each patient using delta2 variables significantly associated with our outcome with p value less than 0.05 and it was included in multivariate logistic regression model. These were age, sex and final diagnosis.

RESULT

The mean heart rate is significantly lower in Group B when compared to Group F from the second and up to the tenth minute after intubation.

Mean Heart Rate	Butorphanol Group	Fentanyl Group
Pre-Op 1	82.4 ± 4.65	81.4 ± 4.59
Pre-Op 2	81.0 ± 5.14	78.67 ± 4.95
PI (Pre-Induction)	78.13 ± 5.30	75.8 ± 11.63
T1	89.93 ± 4.63	90.8 ± 3.40
T2	85.73 ± 4.97	88.87 ± 3.03
T3	81.87 ± 5.17	85.7 ± 3.09
T4	78.0 ± 5.38	82.33 ± 2.94
T5	74.07 ± 4.40	78.63 ± 2.55
T10	69.17 ± 2.72	75.9 ± 2.39

Mean systolic blood pressure is significantly lower in Group B when compared to Group F at the second and third minute after intubation.

Mean Systolic BP	Butorphanol Group	Fentanyl Group
Pre-Op 1	123.53 ± 5.72	123.53 ± 4.83
Pre-Op 2	121.96 ± 6.36	123.03 ± 4.99
PI (Pre-Induction)	119.1 ± 6.18	120.13 ± 15.31
T1	129.73 ± 4.90	131.33 ± 2.55
T2	126.6 ± 5.51	129.33 ± 2.41
T3	123.36 ± 6.15	125.46 ± 2.75
T4	120.7 ± 6.24	122.26 ± 2.80
T5	117.86 ± 5.92	118.73 ± 3.07
T10	113.17 ± 6.01	114.06 ± 2.92

Mean diastolic blood pressure is significantly lower in Group B when compared to Group F from immediately before induction and until the tenth minute after induction.

Mean Diastolic BP	Butorphanol Group	Fentanyl Group
Pre-Op 1	82.33 ± 5.47	82.4 ± 3.48
Pre-Op 2	80.83 ± 5.83	81.73 ± 3.44
PI (Pre-Induction)	78.3 ± 5.01	80.53 ± 2.93
T1	87.23 ± 4.56	90.8 ± 1.82
T2	83.2 ± 3.88	89.26 ± 1.85
T3	79.93 ± 4.31	87.06 ± 1.46
T4	76.36 ± 4.01	85.67 ± 1.24
T5	72.9 ± 3.82	82.7 ± 1.49
T10	69.68 ± 2.49	78.3 ± 2.74

DISCUSSION

Even in well-anaesthetised individuals, reflex tachycardia and hypertension on laryngoscopy and intubation occurs quite frequently. The study was done on the focus to search for a better haemodynamic response so that patients compliance will be better with less side effects. We observed that at the doses at which the study drugs were used both could prevent haemodynamic response to a certain extent. However, butorphanol had a significant advantage over an equipotent dose of fentanyl in the sense that the increase in the stress response was comparatively less and of shorter duration.

CONCLUSION

With this study we conclude that the administration of intravenous butorphanol prior to induction of anaesthesia helps on better attenuation of the haemodynamic response to laryngoscopy and endotracheal intubation than intravenous fentanyl. Neither of the drugs was associated with any adverse haemodynamic events. Hence, butorphanol could be an effective alternative to fentanyl for the attenuation of the haemodynamic stress response to laryngoscopy and endotracheal intubation.

REFERENCES

1. Edwards ND, Alford AM, Dobson PM, Peacock JE, Reilly CS. Myocardial ischaemia during tracheal intubation and extubation. *Br J Anaesth.* 1994;73(4):537-539. doi:10.1093/bja/73.4.537
2. Fox EJ, Sklar GS, Hill CH, Villanueva R, King BD. Complications related to the pressor response to endotracheal intubation. *Anesthesiology.* 1977;47(6):524-525. doi:10.1097/0000542-197712000-00013
3. Lutfy K, Eitan S, Bryant CD, et al. Buprenorphine-induced antinociception is mediated by mu-opioid receptors and compromised by concomitant activation of opioid receptor-like receptors. *J Neurosci.* 2003;23(32):10331-10337. doi:10.1523/JNEUROSCI.23-32-10331.2003
4. Lutfy K, Cowan A. Buprenorphine: a unique drug with complex pharmacology. *Curr Neuropharmacol.* 2004;2(4):395-402. doi:10.2174/1570159043359477