



## Original Article

# Role of Bolus Dose of Fentanyl (4 $\mu$ g/kg) in Attenuating Presser Response of Laryngoscope and Tracheal Intubation

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### Abstract

Fentanyl is an opoid drug. It is effective in controlling pain during intra operative period. It was also observed thermodynamically state intra operatively. Hence it was planned to attenuating the hypertensive and tachycardiac response to laryngoscopy and trachel intubation by using bolus dose of Fentanyl (4 $\mu$ g/kg).

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### Methods

Sixty patients of elective surgery were randomly allocated to two groups of thirty patients each. Patient in group A received tablet midazolam (7.5 mg) at the night before surgery and patients in group B received tablet midazolam (7.5 mg) at the night before surgery also received Bolus dose of Fentanyl (3-5 $\mu$ g/kg) at the morning of surgery Just prior to operation. Aneasthesia was induced with Propofol and vacuronium. Systolic, Diastolic, mean artery presser and heart rate were recorded before and after the induction of Aneasthesia and 0, 1, 5 and 10 minutes after trachel intubation.

### Results

Systolic presser was significantly lower in Fentanyl (4  $\mu$ g/kg) as compared to the control group 0,1,5 and 10 minutes after trachel intubation 110 -120, 105-115, 100-105, 90-102 respectively.

Diastolic presser also lower in Fentanyl (4  $\mu$ g/kg), 0,1,5 and 10 minutes after trachel intubation (76-86), (72-84), (70-80), and (65-74). Mean artery presser also lower in Fentanyl (4

$\mu$ g/kg) as compared to the control group 0,1,5 and 10 minutes after trachel intubation (95-105), (90-100), (95-95), (79-86).

Heat rate also lower in Fentanyl (4  $\mu$ g/kg), 0,1,5 and 10 minutes after trachel intubation (100-110), (98-107), (90-100), (88-95)

### Conclusion

Fentanyl (4  $\mu$ g/kg), the present study design attenuates the presser response to laryngoscopy and trachel intubation the use of Bolus dose of Fentanyl just prior to induction continue hemodynamically stable intra operatively. Hense we can use Fentanyl in systemic hypertension, coronary artery disease recent Myocardial refarction and intracranial and aneurysm patients to prevent deleterious effect due to stress response during laryngoscopy and trachel intubation.

### Introduction

Trachel intubation is a part of general anesthesia technique during trachel intubation producing marked circulatory effect such as sudden increase Systolic, Diastolic, mean artery presser and heart

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rate due to noxious stimulus and light plane of general anesthesia<sup>1</sup>. These transient cardiovascular change was well tolerated by healthy individual but great dangerous in systemic hypertension, coronary artery disease recent Myocardial refraction ischaemic patient. In such patient increase of cerebral haemorrhage (systemic hypertension, aneurism) also cardiac arrest (MI, ichtaemic, coronary artery disease)<sup>2</sup>. To minimize those harmful stress responses various techniques maybe used before intubation. Deep plain with volatile anaesthetic agent for 5-10 minuits. Administering lignocain 1.5-2mg/kg intravenously,  $\beta$  adrenergic blocker agent with propranolol esmolol or  $\alpha$  &  $\beta$  blockade agent (labetalol), give sodium nitroprusside, glycering trinitrat 1-2  $\mu$ /kg also using topical airway (lignocain)<sup>3</sup>. Each method and drug was variable effectiveness and contradictory results. More over no technique is free side effect and no single method has achieved universal acceptance.

Fentanyl is a synthetic opoid analgesic drug 100 times potent than morphin. Mainly used during anaesthesia (1-3  $\mu$ gm/kg) for hemodynamic stable intraoperatively and preemptive analgesia also available transdermal patches for chronic cancer pain. Trans mucosal preparation (Fentanyl lollipos) for premedication in used of children<sup>4</sup>. Hence it was planned to used Fentanyl to attenuated the hypertension and tachycardia response during intubation in normotensive. Also used especially for cardiovescular diseased patients under going elective surgery.

### Object of the study

A general objective: To evalau the role of fentanyl in attenuating pressor response to laryngoscopy and tracheal intubation.

B Specific objectives: to assess the attenuating of hemodynamic changes by Fentanyl resulting from laryngoscope and tracheal intubation.

### Material and methods

Place and period of study : This study was carried out in the department of anaesthesia Rajshahi Medical College Hospital during of January /2014 to April/2014.

### Population under study

Sixty patient aged 20-45 years admitted in department of surgery Rajahahi Medical College Hospital under elective surgery requiring general aneasthia were selected for study.

### Inclusion criteria

ASA physical state 1 & 11 age between 20-45 years normotensive patients, patient under going elective surgery.

### Exclusion criteria

(1) Pre existing hypertension, (2) Obese, pregnant (3) Patient requiring emergency surgery (4) Anticipated difficult intubation (5) Known hypertensively to the drug used.

### Study design

After taking informed consent sixty normotensive patients aged between 22-40 years under going elective surgery were randomly allocated in to two groups of equal size group -A and group -B

### Group –A

(Control group) thirty patients : - Patients in group A received tablet Midazolam 7.5 mg at the night before operation day.

### Group-B

(study group) :- Thirty patients :- Patients in group B received tablet Midazolam 7.5 mg at the night before operation day also used Fentanyl 4 $\mu$ gm/kg just before laryngoscope and tracheal intubation .

### Study parameters

- (1) Demographic data :- age, sex, weight.
- (2) Pre-induction variables:- Following variable were recorded immediately before induction of anaesthesia, pulse, systolic arterial presser, Diastolic arterial presser, mean arterial presser and arterial oxygen saturation.
- (3) Post induction variable:-Flowing variable were recorded after induction of anaesthesia just before intubation, after intubation and 1,5,10 minutes after intubation pulse systolic arterial presser Diastolic arterial presser, mean arterial presser, arterial oxygen saturation.

**Description of the procedure**

After Hospital ethics committee approval a total of sixty patients (20-40 year) of either sex belonging to American society of anesthesiologist (ASA). Physical status I or II were allocated randomly to Fentanyl or midazolam group patients with a history of hypertension, anticipated difficult intubation, history of hiatus hernia or gastro esophageal reflex, on drugs which interfere cardiovascular variables (calcium channel blockers and beta blockers), Obese, pregnant and lactating female were excluded.

**Group -A (No -30)**

Patients received tablet midazolam 7.5 mg at the night before surgery.

**G roup –B (No-30)**

Patients received tablet midazolam 7.5 mg at the night before surgery also received injection Fentanyl 4µmg/kg at the morning of surgery just prior to operation.

A uniform Anesthetic technique was used in both group induction was done with Propofol 2mg/kg and vacuronium bromide 0.1mg/kg intravenously, patients were ventilated with 50% n<sub>2</sub>o and 50% o<sub>2</sub>. Halothane 1% for 4 minutes after which laryngoscopy and endotracheal intubation was performed. Then hemodynamic parameter (pulse systolic arterial presser Diastolic arterial presser, mean arterial presser), were recorded just before injection propofol just before tracheal intubation immediately after intubation and then 1,5 and 10 minutes interval.

**Results**

Systolic arterial blood pressure (mm Hg) changes compared to basal value at the various time of intervals.

**Table: 1** Patients characteristic in each group of patients.

Variable	Group –B (No-30)	Group –A (No-30)
Age (year)	34 ±8	34±6
Body (Weight in KG)	58 ±8	59± 6
Sex (M/F)	16/14	14/16

**Table: 2**

Group –B (No-30)	Group –A (No-30)
Basal value	124±10 ----- 120 ±10
Just before intubation	110±10 -----112±10
After intubation	
T <sub>0</sub>	-120±10-----130±8
T <sub>1</sub>	-115±8-----125±9
T <sub>5</sub>	-110±8-----120±10
T <sub>10</sub>	-105±10-----115±8

T<sub>0</sub> (Just intubation), T<sub>1</sub> (One minute after intubation), T<sub>5</sub> (five minute after intubation), T<sub>10</sub> (ten minute after intubation),

Diastolic arterial blood pressure (mm Hg) changes compared to basal value at the various time of intervals.

**Table: 3**

Group –B (No-30)	Group –A (No-30)
Basal value	75±7 ----- 72 ±8
Just before intubation	64±7-----62±9
After intubation	
T <sub>0</sub>	- 78±9-----85±10
T <sub>1</sub>	- 76±8-----83±9
T <sub>5</sub>	- 72±10-----78±10
T <sub>10</sub>	-65±9-----72±8

Mean arterial blood pressure (mm Hg) changes compared to basal value at the various time of intervals.

**Table: 4**

Group –B (No-30)	Group –A (No-30)
Basal value	92±8 ----- 90 ±9
Just before intubation	88±8 -----80±8
After intubation	
T <sub>0</sub>	- 91±9-----102±10
T <sub>1</sub>	- 90±8-----100±9
T <sub>5</sub>	- 85±8-----95±8
T <sub>10</sub>	-80±9-----88±9

Heart rate (beat/minuet) changes compared to basal value at the various time of intervals.

**Table: 5**

Group –B (No-30)	Group –A (No-30)
Basal value 82±8 -----	80 ±10
Just before intubation 77±8 -----	75±8
After intubation	
T <sub>0</sub> - 88±10-----	98±10
T <sub>1</sub> - 85±8-----	96±8
T <sub>5</sub> - 80±10-----	90±10
T <sub>10</sub> -75±8-----	85±8

**Discussion**

Study result show that Fentanyl attenuates the pressure response to intubation as systolic blood pressure, Diastolic blood pressure and mean arterial pressure also heart rate compared to base line as well midazolam patients receiving midazolam showed a significant increase in blood pressure and heart rate associated with tracheal intubation compared to base line level and from patient receiving Fentanyl 4 µgm/kg body weight .

In a study it was observed that systolic arterial pressure was significantly lower in the Fentanyl versus the only midazolam group 0,1,5,10 minutes after intubation. Diastolic arterial pressure also lower in Fentanyl group 0,1,5,10 minutes after intubation. Heart rate also lower in Fentanyl group 0,1,5,10 minutes after intubation.

The effect of Fentanyl, Propofol and their combination in patient under going breast surgery. It was found that mean arterial pressure and heart rate values significantly lower in the group receiving both Fentanyl or Propofol alone<sup>5</sup>. The mean arterial pressure and heart rate in Fentanyl group were lower then only midazolam group.

It has been shown that arterial blood pressure and heart rate response are greater when the duration of laryngoscopy exceeds 40 second. In this study the mean duration of laryngoscope and intubation

did not exceed 15 second . The anaesthetic agents have an important impact on attenuation of the pressure response to laryngoscopy and intubation.

In our study mean arterial pressure decreased significantly at various time intervals (till 5 minutes after intubation) In Fentanyl group as compared to only midazolam group. At ten minutes although there was fall in mean arterial pressure but the deferent was statistically in significant as compared to only midazolam group.

In this study the heart rate less increases as compared to only midazolam group.

On limitation of this study was that there was no measurement of stress mediators such as endogenous plasma catecholamine's. There is controversial in available literature. Some author have linked pressure response to incase in catecholamine levels.

**Conclusion**

In conclusion Fentanyl (4 µmg/kg) attenuates the pressor response associated with laryngoscope and tracheal intubation. The bolus dose of Fentanyl just prior to induction can caused hemodynamic ally stable intra operatively.

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