TO EVALUATE THE COMPARISON OF INTUBATING CONDITIONS USING FENTANYL PLUS PROPOFOL VERSUS NALBUPHINE PLUS PROPOFOL DURING FIBEROPTIC INTUBATION

Simrit Kaur¹, Davinder Chawla², Parmod Kumar³, Amandeep Kaur⁴

¹Assistant Professor, Department of Anaesthesia, Government Medical College, Patiala, Punjab, India.

²Associate Professor, Department of Anaesthesia, Government Medical College, Patiala, Punjab, India.

³Professor and HOD, Department of Anaesthesia, Government Medical College, Patiala, Punjab, India.

⁴Senior Resident, Department of Anaesthesia, Government Medical College, Patiala, Punjab, India.

ABSTRACT

BACKGROUND

Awake nasal or oral flexible fiberoptic intubation (AFOI) is the airway management technique of choice in known or anticipated difficult airway, severe cervical stenosis, Chiari malformation, unstable cervical fracture, limited mouth opening as in temporomandibular disease, mandibular-maxillary fixation, severe facial burn and vertebral artery insufficiency.^[1] Fiberoptic intubation is the best, easiest and most successful method for awake intubation.

MATERIALS AND METHODS

A prospective, comparative and randomized study was conducted on 100 patients undergoing elective surgery under general anaesthesia. Patients were randomly divided into two groups of 50 each. Group I: Patient received bolus of I.V. fentanyl 1 µg/kg+ propofol 1 mg/kg so as to achieve an adequate level of sedation i.e. RSS=3. Group II: Patient received bolus of I.V. nalbuphine 0.2 mg/kg + propofol 1 mg/kg to achieve adequate level of sedation. Haemodynamic parameters (heart rate, systolic and diastolic blood pressure, mean arterial pressure), SpO₂, EtCO₂, total comfort scale and patient's tolerance were assessed during preoxygenation, fiberscope insertion and endotracheal intubation.

RESULTS

Significant difference ($p < 0.05$) between two groups in terms of HR, SBP, DBP, MAP, total comfort score and patient tolerance was seen during fiberscope insertion and endotracheal intubation.

CONCLUSION

Fentanyl plus propofol regimes are suitable for fiberoptic intubation. Fentanyl plus propofol appeared to offer better tolerance, preservation of an airway and spontaneous ventilation, while maintaining haemodynamic stability.

KEY WORDS

Patient's Tolerance, Ramsay Sedation Score, Haemodynamic Parameters, Total Comfort Scale.

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BACKGROUND

Awake nasal or oral flexible fiberoptic intubation (AFOI) is the airway management technique of choice in known or anticipated difficult airway, severe cervical stenosis, Chiari malformation, unstable cervical fracture, limited mouth opening as in temporomandibular disease, mandibular-maxillary fixation, severe facial burn and vertebral artery insufficiency.^[1] Tracheal intubation is the placement of a flexible plastic tube into the trachea to maintain a patent airway for ventilation. Fiberoptic intubation is the best, easiest and most successful method for awake intubation. The main aim of awake intubation is to have a calm and cooperative patient who can follow verbal commands while maintaining adequate oxygenation and ventilation.

Good topical anaesthesia is essential to obtund the sensory afferent stimuli of the oropharyngeal and laryngotracheal region. Establishing topical anaesthesia before intubation prevents coughing, swallowing, laryngospasm and excessive salivation. Both optimal intubating conditions and patient comfort are necessary while preparing the patient for fiberoptic intubation. An ideal sedative is expected to provide comfort and elicit patient cooperation while maintaining haemodynamic stability and spontaneous ventilation. Drugs used for sedation during awake fiberoptic intubation include fentanyl, midazolam, ketamine, propofol, dexmedetomidine, remifentanyl etc.^[2-5]

Fiberoptic intubation can be performed awake under sedation with or without topical anaesthesia or with muscle relaxant (Suxamethonium, vecuronium, rocuronium, atracurium). For sedation, drugs that may be used are fentanyl/opioids, midazolam, propofol, dexmedetomidine, remifentanyl. Each drug has advantages and disadvantages. Fentanyl or other narcotics reduce the discomfort and haemodynamic changes associated with airway instrumentation.^[6] In order to compare the different drugs for fiberoptic laryngoscopy which produces better intubating conditions with minimal side effects or no side effects, the present study was conducted to compare the intubating

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Corresponding Author:

Dr. Davinder Chawla,

Associate Professor,

Department of Anaesthesia,

Government Medical College,

Patiala, Punjab, India.

E-mail: chawladavinder64@yahoo.com

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condition using fentanyl plus propofol versus nalbuphine plus propofol during fiberoptic intubation.

MATERIALS AND METHODS

The present prospective, comparative and randomized study was conducted in department of Anaesthesia and intensive care, Government Medical College, Rajindra Hospital, Patiala, after obtaining the approval from ethical committee and after informed consent from all the patients. The study was conducted on 100 patients of either gender aged between 18 to 60 years of age belonging to ASA-I or II and scheduled for elective surgery under general anaesthesia.

Sample Size

Was estimated based on pilot study; mean difference in heart rate in two groups was 8.75 with SD of 15.06. With this our sample size $n=47$ per group at a power of 80% and confidence interval of 95% with z value of 1.96. For possible dropouts, it was decided to include 50 patients per group.

$n = (Z_{\alpha/2} + Z_{\beta})^2 \cdot 2 \cdot \sigma^2 / d^2$, where $Z_{\alpha/2}$ is the critical value of the normal distribution at $\alpha/2$, Z_{β} is the critical value of the normal distribution at β , σ^2 is the population variance and d is the difference between two means.

All the patients were randomly divided into two groups by simple envelope method. Patients were kept fasting for atleast 6 hours preoperatively. Preanaesthetic check-up was done in every patient including detailed history, clinical examination and necessary investigations. All patients received Inj. Glycopyrrrolate (0.2 mg) i/m 30 min before the elective surgery. Viscous gargles with 2% lignocaine was done to achieve adequate topical anaesthesia. Patient shifted to ot. Patient placed in supine position. I.V. line secured. Monitors attached to view HR, BP, SpO₂ and EtCO₂. Nasal mucosa was sprayed with vasoconstrictor xylometazoline 0.1%. Each nostril was checked for patency. The nostril with least resistance was chosen for nasal intubation. Nasal mucosa was sprayed with 2 puffs of 10% lignocaine. For further topical anaesthesia 2 puffs of 10% lignocaine was sprayed to tonsillar pillars and back of throat.

Nasopharyngeal dilator with lignocaine jelly was introduced in each nostril. Transtracheal block was given with 3 ml of 4% lignocaine. The local anaesthetic dose was not exceeding 4 mg/kg.^[7] A more rapid delivery of local anaesthetic reduces the risk of needle induced trauma due to coughing.^[8]

Statistical Analysis

Analysis was conducted using IBM SPSS statistics (version 22.0). Statistical Analysis is done by using Chi square test, means of 2 continuous normally distributed variables were compared by independent samples, Student's t-test.

Group I

Patient received bolus of I.V. fentanyl 1 ug/kg+ propofol 1 mg/kg so as to achieve an adequate level of sedation.

Group II

Patient received bolus of I.V. nalbuphine 0.2 mg/kg + propofol 1 mg/kg to achieve adequate level of sedation i.e RSS=3.

Lidocaine jelly applied to fibroscope and nostril. Under the guidance of video, fibroscope advanced. On reaching the carina, endotracheal tube was railroaded over the fibroscope. Tracheal placement confirmed by locating murphy's eye during removing the fibroscope. Fiberoptic nasotracheal intubation done in both groups of patients. Duration of fiberoptic intubation was different in different patients ranging from 1 to 5 minutes. Once tracheal intubation was completed and the tube was secured, general anaesthesia was administered. Clinically patients were monitored, and following observation was recorded during the course of intubation-

1. Comfort scale values were recorded by the anaesthesiologist during pre- oxygenation, at point of introduction of fibroscope and at the introduction of ET tube.

Parameter	1	2	3	4	5
Alertness	Deeply Asleep	Lightly Asleep	Drowsy	Fully Awake and Alert	Hyper-Alert
Calmness	Calm	Slightly Anxious	Anxious	Very Anxious	Panicky
Respiratory Response	No Coughing and No Spontaneous Respiration	Spontaneous Respiration	Occasional Cough	Coughing Regularly	Frequent Coughing or Choking
Crying	Quiet Breathing, No Crying	Sobbing or Gasping	Moaning	Crying	Screaming
Physical Movement	No Movement	Occasional Slight Movement	Slight Frequent Movement	Vigorous Movement Restricted to Extremities	Vigorous Movement Including Head and Chest
Muscle Movement	Muscles Totally Relaxed, No Muscle Movement	Reduced Muscle Tone	Normal Muscle Tone	Increased Muscle Tone and Flexing of Fingers and Toes	Extreme Muscle Rigidity and Flexing of Fingers and Toes
Facial Tension	Facial Muscle Totally Relaxed	No Facial Tension Evident	Tension Evident throughout Facial Muscle	Facial Muscle Contorted	Grimacing
Total Score	35				
Comfort Scale, as Modified from Ambuel et al[9]					

The total comfort score for each patient was calculated by summing the scores of the 7 comfort categories at each time point-

1. Patient's tolerance was assessed by an independent observer on the basis of 5 point FOI score:^[7] No reaction(1), Slight

Grimacing (2), Severe grimacing (3), Verbal objection (4), Defensive movement of head, hands or feet (5).

2. Patient baseline vitals (HR, SBP, DBP, MAP, EtCO₂, SpO₂) were recorded during preoxygenation, during fibroscope insertion, ETT placement and then every minute for the next five minutes.

RESULTS

Demographic Parameters

The two groups, group I (fentanyl+propofol) and group II (nalbuphine+propofol) were comparable in terms of baseline demographic parameters like age (t test), Gender (chi square test).

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p- Value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
Baseline Heart Rate	86.98	10.56	87.76	10.54	0.948	NS
During Pre-Oxygenation Heart Rate	86.76	9.59	88.66	10.80	0.516	NS
Heart Rate Baseline Heart Rate (Per Min.) and during Pre-Oxygenation						

There was no significant difference in HR between two groups during baseline and pre-oxygenation.

Time Interval (per minute)	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
1 min.	89.74	10.02	93.28	10.66	0.180	NS
2 min.	90.82	10.34	96.32	10.57	0.038	S
3 min.	91.42	10.63	98.52	10.54	0.004	HS
4 min.	91.88	10.43	100.06	9.80	<0.001	HS
5 min.	92.16	10.48	101.08	9.00	<0.001	HS
Mean Heart Rate During FOS						

On comparing the heart rate between two groups, no significant differences were found at 1 min. interval ($p>0.05$) during fiberscope insertion. At 2 min. interval significant difference was found and at 3, 4, 5 mins. interval highly significant difference was found between both the groups.

Time Interval (per minute)	Group I (Fentanyl + Propofol)		Group II (Nalbuphine+ Propofol)		p-Value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
1 min.	92.76	10.57	103.22	8.84	<0.001	HS
2 min.	91.66	10.26	103.70	9.50	<0.001	HS
3 min.	89.94	9.17	104.56	9.40	<0.001	HS
4 min.	88.74	8.81	105.08	9.07	<0.001	HS
5 min.	87.38	8.56	104.78	9.90	<0.001	HS
Mean Heart Rate During ET						

On comparing the heart rate between two groups highly significant difference were found at 1, 2, 3, 4, 5 mins intervals during endotracheal tube placement. ($p<0.05$).

Our study shows no significant difference in mean heart rate between two groups at baseline and preoxygenation but shows significant difference in mean heart rate during FOS and endotracheal tube placement.

Kay et al^[10] (1985) conducted study for comparison of fentanyl and nalbuphine for blocking the circulatory responses to tracheal intubation and found significant rise in heart rate in nalbuphine group.

Smith et al in^[11] 1992 conducted a study to see effect of fentanyl on the circulatory responses to orotracheal fiberoptic intubation and Macintosh intubation and

concluded that fentanyl appears to have useful place in attenuating the cardiovascular effects of fiberoptic intubation under general anaesthesia.

Khan et al^[12] (2002) conducted study on comparative evaluation of fentanyl and nalbuphine in total intravenous anaesthesia with propofol infusion in laparoscopic surgery and found that heart rate response was significantly higher in nalbuphine group.

Bhandari et al^[13] (2014) conducted a comparative study of attenuation haemodynamic responses to intubation using fentanyl and nalbuphine and found that nalbuphine group had increased heart rate during intubation..

Our study concluded that rise in heart rate during fiberoptic intubation was more in nalbuphine and propofol group as compared to fentanyl and propofol group.

Blood Pressure

Systolic Blood Pressure

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
Baseline SBP	128.58	10.50	124.88	10.34	0.107	NS
During Pre-oxygenation SBP	127.86	8.75	127.48	10.12	0.986	NS
Mean Baseline SBP and during Pre-Oxygenation						

There was no significant difference between the two groups. ($p>0.05$).

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
1 min.	128.94	7.96	132.62	9.61	0.031	S
2 min.	130.16	8.34	136.50	8.76	<0.001	HS
3 min.	130.22	7.85	140.06	7.77	<0.001	HS
4 min.	130.88	7.57	142.12	7.94	<0.001	HS
5 min.	129.96	8.01	143.94	7.95	<0.001	HS
Mean SBP during FOS						

Significant difference was found in the SBP measurements during Fiberscope insertion between the two groups. ($p<0.05$). At 1 min. interval and highly significant difference was found between both groups at 2-, 3-, 4- and 5-min. intervals.

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine+ Propofol)		p-Value	Signi- ficance
	Mean	SD ±	Mean	SD ±		
1 min.	128.78	7.28	144.96	8.57	<0.001	HS
2 min.	128.30	6.78	147.02	9.26	<0.001	HS
3 min.	128.72	7.79	147.66	8.69	<0.001	HS
4 min.	127.60	7.54	148.12	9.81	<0.001	HS
5 min.	127.50	7.25	148.92	10.31	<0.001	HS
Mean SBP during ET						

Highly significant difference was found in the SBP measurements during endotracheal tube placement between the two groups. ($p<0.05$). The systolic blood pressure in our study shows no significant difference among two groups during baseline and preoxygenation but shows highly

significant difference in SBP between two groups during FOS and during ETT placement.

Diastolic Blood Pressure

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
Baseline DBP	80.38	8.09	79.26	7.19	0.672	NS
During Pre-Oxygenation DBP	80.50	7.82	81.34	6.41	0.627	NS
Mean baseline DBP and during Pre-Oxygenation						

There was no significant difference between the two groups. (p>0.05).

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
1 min.	82.18	8.05	84.54	6.81	0.094	NS
2 min.	81.96	8.01	87.08	6.09	<0.001	HS
3 min.	82.90	7.82	89.72	6.39	<0.001	HS
4 min.	83.54	8.12	90.66	5.62	<0.001	HS
5 min.	82.86	8.38	90.56	5.17	<0.001	HS
Mean DBP during FOS						

At 1 min interval no significant difference was found between both groups, but highly significant difference was found in the DBP measurements during fiberscope insertion 2, 3, 4, 5 min. intervals between the two groups. (p<0.05).

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p value	Significance
	Mean	SD ±	Mean	SD ±		
1 min	81.52	8.63	92.98	6.02	<0.001	HS
2 min	81.58	8.21	93.48	5.93	<0.001	HS
3 min	82.44	8.44	93.40	5.68	<0.001	HS
4 min	81.96	7.93	93.12	5.68	<0.001	HS
5 min	81.62	7.43	94.24	5.16	<0.001	HS
Mean DBP during ET						

Highly significant difference was found in the DBP measurements during endotracheal tube placement at times 1, 2, 3, 4, 5 min interval (p< 0.05)

Our study shows no significant difference in DBP between both groups during baseline and preoxygenation but shows highly significant difference between both the groups during FOS and ETT placement.

Mean Arterial Pressure

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p value	Significance
	Mean	SD ±	Mean	SD ±		
Baseline MAP	96.16	8.77	94.24	7.27	0.145	NS
During Pre-oxygenation MAP	96.20	7.32	96.34	7.26	0.844	NS
Mean Baseline MAP and during Pre-Oxygenation						

There was no significant difference between the two groups. (p> 0.05)

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
1 min.	97.84	7.38	100.40	6.89	0.070	NS
2 min.	98.20	7.00	102.98	6.13	0.001	HS
3 min.	98.38	7.06	106.16	5.74	<0.001	HS
4 min.	99.56	7.23	107.62	5.31	<0.001	HS
5 min.	98.42	7.69	108.06	5.09	<0.001	HS
Mean MAP during FOS						

No significant difference was found in MAP measurements at 1 min. interval between both groups and highly significant difference was found in the MAP measurements during fiberscope insertion 2, 3, 4, 5 min. intervals between the two groups. (p<0.05).

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
1 min.	96.86	8.37	109.78	5.86	<0.001	HS
2 min.	97.24	7.28	110.76	6.18	<0.001	HS
3 min.	97.88	7.60	111.00	5.40	<0.001	HS
4 min.	97.30	7.16	111.20	5.85	<0.001	HS
5 min.	96.36	6.90	111.96	5.61	<0.001	HS
Mean MAP during ET						

Highly significant difference was found in the MAP measurements during endotracheal tube placement at 1, 2, 3, 4, 5 min. intervals (p<0.05).

Our findings demonstrate that there was no significant difference in MAP measurements during baseline and preoxygenation, but highly significant difference was found between both the groups during FOS and ETT placement.

Kay et al^[10] (1985) conducted study on comparative evaluation of fentanyl and nalbuphine for blocking the circulatory response to tracheal intubation and found significant increase in blood pressure in nalbuphine group as compared to fentanyl group.

Khan et al^[12] (2002) had compared nalbuphine and fentanyl as total intravenous anaesthesia with propofol infusion in laparoscopic surgery and found significant increase in systolic blood pressure and diastolic blood pressure in nalbuphine group as compared to fentanyl group.

Freye et al^[14] (2001) conducted study to compare cardiovascular response to laryngoscopy and tracheal intubation with fentanyl and nalbuphine and found that significant increase in systolic blood pressure in nalbuphine group as compared to fentanyl.

Sharma et al (2014) conducted a comparative study of haemodynamic response to intubation with fentanyl and nalbuphine and found significant rise in systolic and diastolic blood pressure in nalbuphine group as compared to fentanyl group.

Prashad et al^[15] (2016) conducted a comparative study of analgesic potential of nalbuphine versus fentanyl during general anaesthesia and found significant increase in systolic blood pressure in nalbuphine group as compared to fentanyl.

Our study concluded that rise in systolic, diastolic and mean blood pressure during fiberoptic intubation was more

in nalbuphine+propofol group as compared to fentanyl+propofol group.

Total Comfort Score

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine+ Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
During Pre Oxygenation	12.86	1.22	12.66	1.18	0.746	NS
During FOS	14.00	1.90	14.96	1.32	0.001	S
During ET	15.20	2.08	16.06	1.05	0.022	S
Total Comfort Score (TCS)						

The Total Comfort Score when calculated showed a significant difference between the two groups during FOS and ET. Our study shows that fentanyl and propofol provided better intubating conditions as compared to nalbuphine and propofol.

Rai et al^[16] (2008) in their study remifentanyl target-controlled infusion vs propofol target controlled infusion for conscious sedation for awake fiberoptic intubation observed better intubating conditions with remifentanyl as compared to propofol.

Dhasmana et al^[17] (2010) also observed in their study awake blind nasotracheal intubation in temporomandibular joint ankylosis patients under conscious sedation using fentanyl and midazolam that these drugs provide better intubating conditions in awake nasotracheal intubation.

Rodrigues et al^[18] (2013) conducted study on difficult airway intubation with flexible bronchoscope on 102 patients and concluded that fiberoptic bronchoscope intubation in conscious sedation protocol with midazolam and fentanyl provides better intubating conditions and was safe in the management of patients with difficult airway.

Our study also concludes that fentanyl and propofol provides better intubating conditions as compared to nalbuphine and propofol.

Patients' Tolerance to the Placement of Tube

Time Interval	Group I (Fentanyl + Propofol)		Group II (Nalbuphine + Propofol)		p-Value	Significance
	Mean	SD ±	Mean	SD ±		
FOS	3.28	0.72	3.56	0.61	0.035	S
ET	2.38	0.53	2.64	0.56	0.028	S
Patient's Tolerance based on 5 Point Fiberoptic Index Score						

Significant difference between two groups ($p < 0.05$) was found suggesting that fentanyl and propofol had better patient tolerability.

DISCUSSION

Our study shows no significant difference in mean heart rate between two groups at baseline and preoxygenation but shows significant difference in mean heart rate during FOS and endotracheal tube placement.

Kay et al^[10] (1985) conducted study for comparison of fentanyl and nalbuphine for blocking the circulatory responses to tracheal intubation and found significant rise in heart rate in nalbuphine group.

Smith et al^[11] 1992 conducted a study to see effect of fentanyl on the circulatory responses to orotracheal fiberoptic intubation and Macintosh intubation and concluded that fentanyl appears to have useful place in attenuating the cardiovascular effects of fiberoptic intubation under general anaesthesia.

Khan et al^[12] (2002) conducted study on comparative evaluation of fentanyl and nalbuphine in total intravenous anaesthesia with propofol infusion in laparoscopic surgery and found that heart rate response was significantly higher in nalbuphine group.

Bhandari et al^[13] (2014) conducted a comparative study of attenuation haemodynamic responses to intubation using fentanyl and nalbuphine and found that nalbuphine group had increased heart rate during intubation.

Our study concluded that rise in heart rate during fiberoptic intubation was more in nalbuphine and propofol group as compared to fentanyl and propofol group.

Our findings demonstrate that there was no significant difference in MAP measurements during baseline and preoxygenation, but highly significant difference was found between both the groups during FOS and ETT placement.

Kay et al^[10] (1985) conducted study on comparative evaluation of fentanyl and nalbuphine for blocking the circulatory response to tracheal intubation and found significant increase in blood pressure in nalbuphine group as compared to fentanyl group.

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Our study concluded that rise in systolic, diastolic and mean blood pressure during fiberoptic intubation was more in nalbuphine+propofol group as compared to fentanyl+propofol group.

Our study shows that fentanyl and propofol provided better intubating conditions as compared to nalbuphine and propofol.

Rai et al^[16] (2008) in their study remifentanyl target-controlled infusion vs propofol target controlled infusion for conscious sedation for awake fiberoptic intubation observed better intubating conditions with remifentanyl as compared to propofol.

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Significant difference between two groups ($p < 0.05$) was found suggesting that fentanyl and propofol had better patient tolerability.

Dhasmana et al^[17] (2010) also observed in their study awake blind nasotracheal intubation in temporomandibular joint ankylosis patients under conscious sedation using fentanyl and midazolam that these drugs provide better patient comfort and sedation in awake nasotracheal intubation.

Rodrigues et al^[18] (2013) conducted study on difficult airway intubation with flexible bronchoscope on 102 patients and concluded that fiberoptic bronchoscope intubation according to the conscious sedation protocol with midazolam and fentanyl effective and safe in the management of patients with difficult airway.

CONCLUSION

Fiberoptic intubation remains the accepted standard in elective airway management of the awake spontaneously breathing patient with an anticipated difficult airway.^[23] Fiberoptic intubation proves beneficial as it avoids mechanical stimulus to oropharynx and larynx and attenuates pressor response to tracheal intubation. Fiberoptic nasotracheal intubation was done in both groups of patients. Mean Heart Rate measured during fiberoptic intubation showed statistically significant increase in heart rate with nalbuphine (0.2 mg/kg) and propofol (1 mg/kg) than fentanyl (1 µg/kg) and propofol (1 mg/kg). SBP, DBP and MAP measured during fiberoptic intubation showed statistically significant increase with nalbuphine (0.2 mg/kg) and propofol (1 mg/kg) than fentanyl (1 µg/kg) and propofol (1 mg/kg). SpO₂ values during preoxygenation, fiberscope insertion and endotracheal intubation was not significant in both groups. No episode of apnoea was noted in any of the patients. Patients in fentanyl and propofol group (Group I) felt more comfortable during AFOI than nalbuphine and propofol group (Group II). No significant difference was found in EtCO₂ between both groups. Patients who received fentanyl and propofol (Group I) had better tolerance to AFOI than those who received nalbuphine and propofol (Group II).

To conclude, the use of fentanyl (1 µg/kg) and propofol (1 mg/kg) is safe and effective in patients undergoing fiberoptic intubation offering conscious sedation, better tolerance and comfort while maintaining oxygen saturation without any haemodynamic alteration while on the other side use of nalbuphine (0.2 mg/kg) and propofol (1 mg/kg) during fiberoptic intubation causes significant increase in heart rate, blood pressure and provides less tolerance and comfort.

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