

Dexmedetomidine for Awake Bronchoscopy: Our Experience

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Abstract

Background: Respiratory physicians are showing interest in using Dexmedetomidine for awake sedation, since, it is safe and useful when the patient is having spontaneous breathing and also cost-effective. We evaluated the safety and efficacy of dexmedetomidine in a small cohort of thirty patients undergoing awake bronchoscopy under topical anaesthesia using 10% Xylocaine. **Methods:** Premedication was with midazolam and rescue medication was fentanyl. Dexmedetomidine was infused at one µg/kg infused over 10 minutes. The bronchoscope was inserted after bolus infusion followed by maintenance infusion of Dexmedetomidine started with 0.2µg/kg/h and titrated optionally to 0.7µg/kg/h. We recorded the pre- and intra-procedural vital signs and Ramsay sedation score were recorded every 10 minutes, in addition to adverse events, duration of the procedure, use of rescue sedation with fentanyl one µg/kg, and physicians and patient's satisfaction. Patients were discharged as per the modified post-anesthetic discharge scoring system. **Results:** Mean Duration of procedure was 30±10 min. Percentage of patients requiring rescue sedation was 3/30 (10%). 3/30 (10%) of patients had hypotension, 6/30 (20%) had bradycardia and 1/30 (3.3%) had amnesia. The mean time to recovery was 25±10 min. The physician and patient's satisfaction score (range, 1 to 5) were five and four respectively. **Conclusion:** Dexmedetomidine alone is safe, provides satisfaction to both doctors and patients, with fewer anticipated and spontaneously recoverable side effects.

Keywords: Awake Bronchoscopy; Patient Satisfaction; Dexmedetomidine.

Introduction

Flexible bronchoscopy is an endoscopic procedure for diagnosis and therapeutic manipulations of airway disease. Respiratory physicians commonly perform it under topical anaesthesia. However, physicians are now showing interest in using sedation as an adjunct to topical anaesthesia [1]. Sedation has proved to improve procedural tolerance and patient satisfaction [2] and conscious sedation is now commonly used for such procedures [3-5]. Dexmedetomidine, an alpha₂ agonist, has features of sedation, sympatholysis, antisialagogue, analgesia, minimal effect on respiration, and additionally opioid sparing effect

[6]. Moreover, dexmedetomidine recipients were calmer and easier to arouse more co-operative and better able to communicate [7-8]. Physicians are showing interest in using dexmedetomidine for sedation, since, it is safe and useful when the patient is having spontaneous breathing and also cost-effective [1,9]. Even a Single-dose dexmedetomidine attenuates airway and circulatory reflexes during extubation [10].

Methods

This study was conducted on patients undergoing awake diagnostic bronchoscopy, both male and female patients in the age group 20-60 years

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satisfying ASA criteria I & II were included. This procedure was carried out under topical anaesthesia using 10% Xylocaine; Premedication was with midazolam and rescue medication was fentanyl. Dexmedetomidine was infused at one $\mu\text{g}/\text{kg}$ infused over 10 minutes. The bronchoscope was inserted after bolus infusion followed by Maintenance infusion of Dexmedetomidine was started with $0.2\mu\text{g}/\text{kg}/\text{h}$ and titrated optionally to $0.7\mu\text{g}/\text{kg}/\text{h}$ [6] to achieve a Ramsay Sedation Scale score of 3 (Table-1)[11].

The demographic data were collected, and the pre- and intra-procedural vital signs and Ramsay sedation score were recorded every 10 minutes. Additionally, we also recorded adverse events, duration of the procedure, recovery time defined as the time from tracheal extubation and emergence from anaesthesia, use of rescue sedation with fentanyl $1\mu\text{g}/\text{kg}$. Patients were discharged as per the Modified Postanesthetic Discharge Scoring

System (Table 2)[12]. Physicians and patient's satisfaction were measured on five points Likert scale-1-5 where one is no satisfaction, 2-somewhat, 3-better, 4-good and 5-excellent.

Statistical Analysis

Data was entered into Microsoft Excel spreadsheet 2007, cleaned and mined for further computations using SPSS. Descriptive statistics were mean, median, SD, numbers and percentages. ANOVA and chi-square were the inferential statistical tests. A two-tailed probability value less than 0.05 was considered significant

Results

The mean age of the patients was 44 ± 8 years. There were 22 Males and eight females. Mean

Table 1: Ramsay sedation scale[11]

Score	Response				
1	Anxious or restless or both	Awake	4	Brisk response to stimulus	Asleep
2	Cooperative, orientated and tranquil		5	Sluggish response to stimulus	
3	Responding to commands		6	No response to stimulus	

Table 2: Modified Postanesthetic Discharge Scoring System[12]

Vital signs	Activity
BP and HR \pm 20% of baseline value-2	Steady gait, no dizziness -2
BP and HR \pm 20%-40% of baseline value-1	Requires assistance-1
BP and HR \pm 40% of baseline value-0	Unable to ambulate-0
Nausea and vomiting	Pain
No, or minimal/treated with oral. Medication-2	Minimal or no pain=2
Moderate/treated with parenteral medication-1	Moderate =1
Severe/continues despite treatment-0	Severe =0
Surgical bleeding	Total score
None or Minimal (not requiring intervention)-2	Patients' scoring ≥ 9 for two consecutive measurements are considered fit for discharge home
Moderate (1 episode of bleeding)-1	
Severe (≥ 2 episodes of bleeding)-0	

Table 3: Clinical Parameters and outcomes of patients undergoing awake bronchoscopy

Age	44 \pm 8 years
Gender (M/F)	22/8
Mean Duration of procedure	30 \pm 10 min
Mean Time to Recovery	25 \pm 10 min
Median Physicians Satisfaction	5
Median Patients Satisfaction	4
Percentage use Rescue sedation	3/30 (10 %)
Complications	
Failed bronchoscopy	0/30 (0 %)
Pain during injection	0/30 (0 %)
Vomiting	0/30 (0 %)
% of patients with drop in oxygen saturation	1/30 (3.3 %)
% of patients with Apnea	0/30 (0 %)
% of patients with Amnesia	1/30 (3.3 %)
% of patients with Hypotension	3/30 (10 %)
% of patients with Bradycardia	6/30 (20 %)

Table 4: Dynamics of vital parameters during dexmedetomidine infusion

Dose	Time (min)	Heart Rate (/min)	SBP(mmHg)	DBP(mmHg)	SpO2100 (%)
Baseline	0	88±8	130±6	80±8	100±0
Bolus dose	10	82±6	140±8	78±5	100±0
Maintenance dose	20	70±7	120±8	70±4	99±1
	30	66±6	114±7	74±7	98±2
	40	64±7	108±5	72±6	98±3
	50	68±6	100±6	68±5	99±2
	60	64±7	102±6	76±6	97±2
P value	-	P<0.05	P<0.05	P<0.05	P>0.05

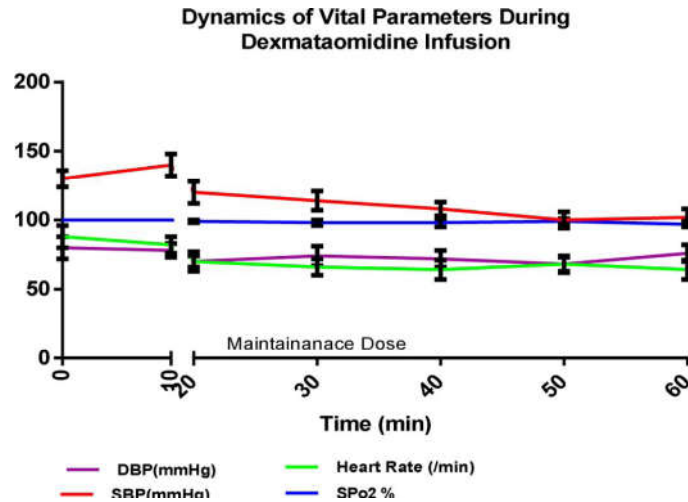


Fig. 1: Dynamics of vital parameters during dexmedetomidine infusion

Duration of procedure was 30±10 min. Percentage of patients requiring rescue sedation was 3/30 (10%). 3/30 (10%) of patients had hypotension, 6/30 (20%) had bradycardia and 1/30 (3.3%) had amnesia. The mean time to recovery was 25±10 min. The physician and patient’s satisfaction score (range, 1 to 5) were five and four respectively (Table 3 & 4).

Discussion

Dexmedetomidine, an active Dextro- isomer of medetomidine, a selective alpha (2)-adrenergic receptor agonist, is used for the sedation of mechanically ventilated adult patients [7] and patients before and during surgical and other procedures in non-intubated adults [7]. The literature says that hemodynamic and respiratory stability can be achieved even as a single sedative agent [13]. In our study, we evaluated the safety and effectiveness of dexmedetomidine in patients undergoing awake bronchoscopy and found that 10% of patients developed hypotension and 20% bradycardia. However, these features recovered spontaneously without intervention. A similar

report says that hypotension and bradycardia are common with dexmedetomidine usually resolve without intervention [7].

Only 10% of our patients required addition sedation with fentanyl. Similarly, a study says that the patients who were given dexmedetomidine required less propofol or intravenous midazolam as rescue sedation to achieve and maintain optimal sedation during the procedures [7].

A study reported that only 3% of patients receiving dexmedetomidine experienced delirium whereas it was 50%, propofol and 50% midazolam and such a patients require longer hospitalisation causing economic burden [14]. None of our patients developed delirium except for one patient developed amnesia, and he came to normalcy with reassurance.

A report demonstrates that, as compared to fentanyl, Dexmedetomidine is more efficient during intubation, inducing sedation, maintaining hemodynamic stability and less oxygen desaturation [15]. We also observed that none of our patients developed apnoea, only one patient had dropped in oxygen saturation. An additional notable feature found in our study that, both

physicians and patients reported a high satisfaction. Dexmedetomidine was more effective in attenuating airway reflex responses to tracheal extubation and maintaining hemodynamic stability without prolonging recovery compared with fentanyl [16]. In our study, all patients recovered within 25±10 min. A study has reported that as compared with midazolam, dexmedetomidine provided better oxygen saturation and is equally well tolerated for conscious sedation in postoperative patients undergoing bronchoscopy [17]. Dexmedetomidine shortened the time to extubation as compared with standard sedatives and the savings potential of dexmedetomidine results primarily from shorter time to extubation [8].

Conclusion

We found that for awake bronchoscopy Dexmedetomidine alone is safe, provides satisfaction to both physicians and patients, with fewer spontaneously recoverable adverse effects such as hypotension in 10%, bradycardia in 20% and amnesia in 3.3%.

Conflict of Interest: None

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