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Brussels sedation scale when different doses of dexmedetomidine is used with propofol as an inducing agent

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Abstract
Sedation is an important component of patient comfort in the intensive care unit (ICU), especially in those undergoing mechanical ventilation. Sedation that is too light or too deep can have important consequences, and therefore assessment of the degree of sedation should be an important part of patient management. Although there are many methods available to assess the degree of sedation, none is ideal. This study puts in an effort to find the mean brussels sedation scale when different doses of dexmedetomidine is used with propofol as an inducing agent to understand and use the drug more effectively.

Keywords: Brussel's sedation scale, dexmedetomidine, propofol

Introduction
Dexmedetomidine is a potent and highly selective α2 adrenoreceptor agonist which was approved for clinical use in 1999 and recently introduced in India. It has all the above mentioned properties and can impart significant benefits in the peri-operative use. In spite of the multiple desirable effects of dexmedetomidine, bradycardia and hypotension remain clinically significant adverse effects. High doses of dexmedetomidine can result in a decreased heart rate and cardiac output, with a biphasic dose response relation for BP. High doses of dexmedetomidine can also be a cause of systemic and pulmonary hypertension. The most common side effect during induction of anaesthesia with propofol is hypotension. The hemodynamic changes from propofol administration depend on the ability of the compensatory mechanisms to respond to changes and the concomitant use of any other drugs. This study puts in an effort to find the mean brussels sedation scale when different doses of dexmedetomidine is used with propofol as an inducing agent to understand and use the drug more effectively.

Aims and Objectives
To study the brussels sedation scale when dexmedetomidine in different doses is used with propofol as an inducing agent.

Materials and Methods
This study was done in the Department of Anesthesia, Shridevi Institute of Medical Sciences and Research Hospital, Tumkur.
This study was done using 400 patients. The study was done from July 2016 to June 2017.

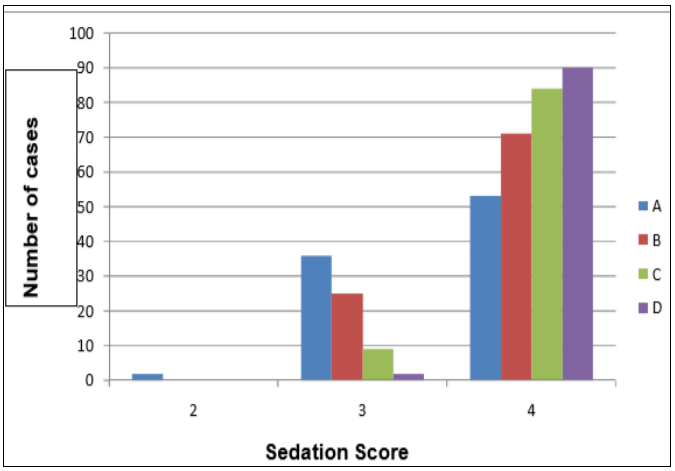
They were divided into 4 groups
Group A received 1 µg/kg of dexmedetomidine.
Group B received 0.6 µg/kg of dexmedetomidine.
Group C received 0.3 µg/kg of dexmedetomidine.
Group D received 20 ml of normal saline.

The Brussels chart

Brussels Sedation Scale	
Score	**Response**
1	Unarousable
2	Responds to painful stimuli but not auditory stimuli
3	Responding to auditory stimuli
4	Awake and calm
5	Agitated

The Brussel's sedation scale was tested at the end of 10 minutes and at the end of 20 minutes.

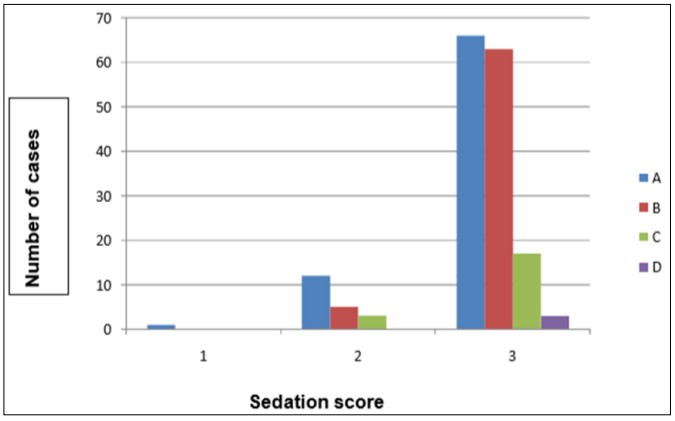
Results



Graph 1: Brussel's Scre at 10 minutes

Group		Sedation Score		
		2	3	4
A	Count(% within group)	2(2.2%)	36(39.6%)	53(58.2%)
B	Count(% within group)	0	25(26.0%)	71(74.0%)
C	Count(% within group)	0	9(9.7%)	84(90.3%)
D	Count(% within group)	0	2(2.2%)	90(97.8%)
Brussels Sedation Scale at 10 minutes				

Fisher's exact test for Brussels Sedation Scale at 10 minutes		
	Value	Significance(p)
Fisher's exact test	57.838	<0.001
Fisher's exact test for Brussels Sedation Scale at 10 minutes		



Graph 2: Brussel's Score at 20 Minutes

Group		Sedation Score			
		1	2	3	4
A	Count(% within group)	1(1.1%)	12(13.2%)	66(72.5%)	12(13.2%)
B	Count(% within group)	0	5(5.2%)	63(65.6%)	28(29.2%)
C	Count(% within group)	0	3(3.2%)	17(18.3%)	73(78.5%)
D	Count(% within group)	0	0	3(3.3%)	89(96.7%)
Brussels Sedation Scale 20 minutes post infusion					

Fisher's exact test for Brussels Sedation Scale 20 minutes post infusion		
	Value	Significance(p)
Fisher's exact test	201.482	<0.001
Fisher's exact test for Brussels Sedation Scale 20 minutes post infusion		

Discussion

Ashraf Ghali and co-workers noted that the time requirement of 20.36±4.66 minutes in dexmedetomidine group from initiating the infusion to achieve targeted levels of sedation (Ramsay Score of 3 responsive to commands) [1]. Few studies have described deep sedation corresponding to Ramsay Score of 5 (asleep, sluggish response to glabellar tap or auditory stimulus) in children [2]. The general consensus seems to be that dexmedetomidine is not suitable to achieve deep sedation [3-6]. In another study the authors observed very few subjects who were deeply sedated. Patients who were sedated and arousable only by painful stimuli (sedation score=3) accounted for 13% of the subjects in group A and 5% in group B. Only 0.25% of the entire study population (1% of group A) were not arousable even to painful stimuli at the end of infusion (sedation score=1). They however had no delay in recovery at the end of the surgical procedure. An author in his study reported a series of three cases where they used dexmedetomidine as a total intravenous anaesthetic agent. They administered dexmedetomidine as a loading dose of 1µg/kg followed by an infusion of 0.7 µg/kg/hour [7]. The infusion was increased to 5 µg/kg/hour for a period of five minutes to achieve adequate depth. In one case they needed to increase the dose to 10 µg/kg/hour for a short period of time to achieve adequate depth. At such high doses they noted that dexmedetomidine could be used as a sole anaesthetic agent. However routine use of such high doses are not recommended as they may be associated with adverse effects [8, 9].

Conclusion

Brussels Sedation Scale at the two intervals showed significantly different scores in the four groups.

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