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Original Research Paper

Anaesthesiology

EVALUATION OF THE EFFECT OF DIFFERENT DOSES OF DEXMEDETOMIDINE ON INDUCTION DOSE OF PROPOFOL

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ABSTRACT

A combination of propofol and dexmedetomidine can cause both beneficial and adverse effects on the patient, it would be ideal to titrate the dosage of dexmedetomidine to retain its desirable effects while negating its side effects. Different doses of dexmedetomidine have been used with an induction agent for attenuation of hemodynamic response to intubation. In this study, we compared and evaluated the different doses of dexmedetomidine for the effect on induction dose of propofol

KEYWORDS : Dexmedetomidine, Induction Dose, 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[1]. 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[2]. Since a combination of propofol and dexmedetomidine can cause both beneficial and adverse effects on the patient, it would be ideal to titrate the dosage of dexmedetomidine to retain its desirable effects while negating its side effects. Different doses of dexmedetomidine have been used with an induction agent for attenuation of hemodynamic response to intubation. In this study, we compared and evaluated the different doses of dexmedetomidine for the effect on induction dose of propofol.

Aims and Objectives:

To evaluat the effect of different doses of dexmedetomidine on induction dose of propofol

Materials and Methods:

This study was done in the Department of Anesthesia in A.J.Institute of Medical Sciences This study was done using 60 patients. The study was done from July 2017 to June 2018.

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.

Inclusion Criteria

1. The patients were aged between 30-50 years
2. The patients had no co-morbidites

Exclusion Criteria

1. Aged below 30 and above 50 years
2. Patients with co-morbidities

All the statistics were done using the SPSS software 2015 (California)

Results:

There is significant intergroup difference between the four groups for induction dose of propofol (p<0.001). Mean propofol dose for loss of eyelash reflex in the groups A, B, C and D were 48.63 mg, 59.48 mg, 71.51 mg, 88.42 mg. Similarly the mean propofol dose for loss of verbal response in the groups A, B,C and D were 47.97 mg, 58.7mg, 71.72 mg , 88.75 mg. Significant differences existed between all groups(<0.001).

Propofol dose(mg)	Group	Mean(mg)	Std. Deviation	Significance(p)
For loss of eyelash	A	48.63	16.246	<0.001
	B	59.48	21.095	
	C	71.51	25.79	
	D	88.42	20.886	
For verbal response	A	47.97	15.184	<0.001
	B	58.7	21.067	
	C	71.72	26.728	
	D	88.75	21.299	

Table Propofol dose

Group	Weight(kg)	Propofol dose(mg/kg)	
		Eyelash reflex	Verbal response
A	52.16	0.93	0.91
B	54.74	1.08	1.07
C	55.25	1.29	1.29
D	53.76	1.64	1.65

Table Propofol dose in mg/kg

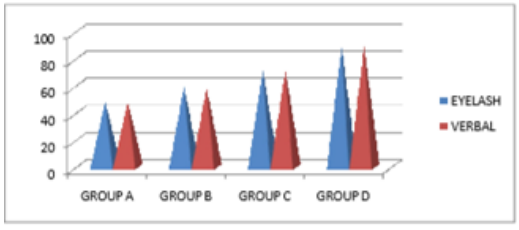

Figure Propofol dose

Discussion:

There was significant intergroup difference between the four groups in terms of propofol requirement for induction (p<0.001). Mean propofol dose for loss of eyelash reflex and verbal response was 48.63 mg (0.93 mg/kg) and 47.97 mg (0.91 mg/kg) respectively in group A. This was much lesser than the dose needed in the control group (1.64 and 1.65 mg/kg for loss of eyelash reflex and verbal response).

In a study an author noted that mean dose of propofol required for induction was 37.5 mg (0.75 mg/ kg) with 1 µg/kg of dexmedetomidine IV given pre induction[3]. However they noted the dose of propofol needed to achieve entropy of 40-60 as compared to loss of verbal response and eyelash reflex in our study. In another study an author studied the effect of dexmedetomidine (1 µg/kg) on propofol induction and hemodynamics associated with laryngoscopy and intubation[4]. They noted a propofol requirement of 1.27±0.22 mg/kg for loss of eyelash reflex with 1 µg/kg of dexmedetomidine given before induction versus 2.27±0.43 mg/kg with placebo. Another author studied dexmedetomidine for controlled hypotension during spinal surgery for idiopathic

scoliosis[5,6] .They noted a propofol induction dose of 1.57 ± 0.27 mg/kg with 1 µg/kg of dexmedetomidine to obtain loss of verbal response. In group B (0.6 µg/kg of dexmedetomidine) mean propofol dose for loss of eyelash reflex was 59.48mg (1.08 mg/kg) and 58.7mg (1.07 mg/kg) for loss of verbal response which was lesser than the dose required in the control group. An author studied effects of dexmedetomidine (0.6 µg/kg bolus and 0.2 µg/kg/hour infusion) on perioperative hemodynamics, propofol consumption, and postoperative recovery and noted a propofol requirement of 1.4±0.4 mg/kg with 0.6 µg/kg of dexmedetomidine for induction versus 2.0±0.4 mg/kg in control group. Similar decrease in induction dose of thiopentone was noted by an author in their study where they used 0.6 µg/kg and 0.5 µg/ kg dexmedetomidine[7]. They noted a 36% reduction in thiopentone induction dose similar to our study where we found a 30% reduction in propofol requirement. We noted that propofol requirement was 71.51 mg (1.29 mg/kg) in group C (0.3 µg/kg of dexmedetomidine) for loss of eyelash reflex and 71.72 mg (1.29 mg/kg) for loss of verbal response. The control group (group D) needed a mean propofol dose of 88.42 mg (1.64 mg/kg) for loss of eyelash reflex and 88.75 mg (1.65 mg/kg) for loss of verbal response. An authoe noted that there was negligible difference in anaesthetic requirement with 0.3 µg/kg of dexmedetomidine compared to placebo. However in their study they noted a difference in isoflurane requirement needed to maintain heart rate and BP within 20% of baseline.

Conclusion:

We observed a reduction in propofol dose requirement for induction. Higher dose of dexmedetomidine was associated with lesser requirement of propofol.

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