

## Assessment of hemodynamic changes and complication occurring with Propofol and Etomidate during general anaesthesia

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### Abstract:

**Background:** General anesthetic induction agents may decrease arterial blood pressure via myocardial depression, vasodilatation and attenuation of autonomic nervous activity. The present study was conducted to find hemodynamic changes and complication occurring with Propofol and Etomidate during general anaesthesia. **Materials & Methods:** 70 patients who were scheduled to undergo surgical procedure under general anaesthesia of both genders were divided into two study groups Group I: 35 patients who received Propofol, and group II 35 patients who received Etomidate group. All the hemodynamic parameter was recorded during the surgery procedure. **Results:** Group I had 20 males and 15 females and group II had 16 males and 19 females. The mean heart rate (beats/min) at baseline was 86 and 87, at induction was 87 and 88, at laryngoscopy was 88 and 90, at one minute was 90 and 91, at five minutes was 88 and 89 and at fifteen minutes was 89 and 88. The mean arterial pressure (mm Hg) at baseline was 92 and 95, at induction was 102 and 88, at laryngoscopy was 96 and 90, at one minute was 98 and 94, at five minutes was 88 and 91 and at fifteen minutes was 94 and 90 in group I and II respectively. **Conclusion:** Etomidate found to be superior in comparison to propofol as an anaesthetic agent.

**Key words:** induction agents, Propofol, Etomidate

### Introduction

General anesthetic induction agents may decrease arterial blood pressure via myocardial depression, vasodilatation and attenuation of autonomic nervous activity.<sup>1</sup> General anesthetic induction agents may decrease arterial blood pressure via myocardial depression, vasodilatation and attenuation of autonomic nervous activity.<sup>2</sup> Conversely, laryngoscopy and endotracheal intubation elicit unwanted cardiovascular responses such as hypertension, tachycardia and dysrhythmias. This sometimes results in “alpine hemodynamic response” to the induction of general anesthesia.<sup>3</sup>

Propofol is a nonopioid, nonbarbiturate, sedative-hypnotic agent with rapid onset and short duration of action. Adverse effects include hypotension and injection pain. Etomidate is a hypnotic agent causing minimal histamine release and very stable hemodynamic profile. However, pain on injection and myoclonus are the most common side effects of this drug.<sup>4,5</sup> Pains on injection, venous irritation and hemolysis have been abolished by new fat emulsion of etomidate (Medium chain triglyceride and soya

bean named Etomidate – Lipuro, B.Braun, Melsungen, Germany), but the new solvent has not reduced the incidence of myoclonus after etomidate injection.<sup>6</sup> Myoclonus is a serious problem in patients either with open globe injury or emergency non fasting conditions. Etomidate has a favorable hemodynamic profile on induction, with minimal blood pressure depression, making it ideal for shock trauma, hypovolemic patients, or patients with significant cardiovascular disease.<sup>7</sup> The present study was conducted to find hemodynamic changes and complication occurring with Propofol and Etomidate during general anaesthesia

### Materials & Methods

The present study consisted of 70 patients who were scheduled to undergo surgical procedure under general anaesthesia of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into two study groups Group I: 35 patients who received Propofol, and group II 35 patients who received Etomidate group. All the patients were premedicated with alprazolam 0.25 mg

and ranitidine 150 mg one night before the surgery. All the hemodynamic parameter was recorded during the surgery procedure. Data thus obtained were

subjected to statistical analysis. P value < 0.05 was considered significant.

## Results

**Table I Distribution of patients**

Groups	Group I	Group II
Agent	Propofol	Etomidate
M:F	20:15	16:19

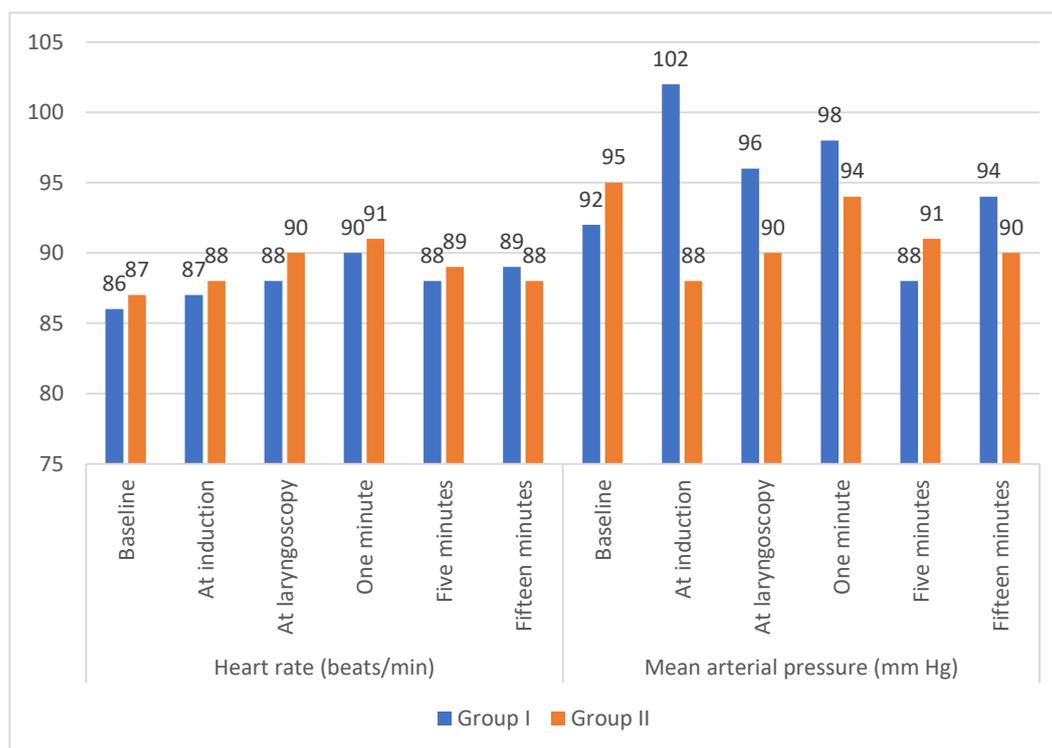
Table I shows that group I had 20 males and 15 females and group II had 16 males and 19 females.

**Table II Comparison of parameters**

Parameters	Variables	Group I	Group II	P value
<b>Heart rate (beats/min)</b>	Baseline	86	87	0.97
	At induction	87	88	
	At laryngoscopy	88	90	
	One minute	90	91	
	Five minutes	88	89	
	Fifteen minutes	89	88	
<b>Mean arterial pressure (mm Hg)</b>	Baseline	92	95	0.05
	At induction	102	88	
	At laryngoscopy	96	90	
	One minute	98	94	
	Five minutes	88	91	
	Fifteen minutes	94	90	

Table II, graph I shows that mean heart rate (beats/min) at baseline was 86 and 87, at induction was 87 and 88, at laryngoscopy was 88 and 90, at one minute was 90 and 91, at five minutes was 88 and 89 and at fifteen minutes was 89 and 88. The mean arterial pressure (mm Hg) at baseline was 92 and 95, at induction was 102 and 88, at laryngoscopy was 96 and 90, at one minute was 98 and 94, at five minutes was 88 and 91 and at fifteen minutes was 94 and 90 in group I and II respectively. The difference was significant ( $P < 0.05$ ).

Graph I Comparison of parameters



## Discussion

Induction agents are drugs that, when given intravenously in an appropriate dose, cause a rapid loss of consciousness.<sup>8</sup> Induction agents are used to induce anesthesia prior to other drugs being given to maintain anesthesia, as the sole drug for short procedures, to maintain anesthesia for longer procedures by intravenous infusion, to provide conscious sedation during procedures undergoing in local anesthesia and intensive care unit.<sup>9</sup> The present study was conducted to find hemodynamic changes and complication occurring with Propofol and Etomidate during general anaesthesia

We found that group I had 20 males and 15 females and group II had 16 males and 19 females. Bansal et al<sup>10</sup> assessed hemodynamic changes and complication occurring with propofol and etomidate during general anaesthesia. Incidence of complications was slightly higher among subjects of group A. Mean arterial pressure among patients of group A at baseline, at induction, at laryngoscopy, after one minute, after five minutes and after fifteen minutes were 92, 76, 105, 101, 92 and 95 respectively. Mean arterial pressure among patients of group B at baseline, at induction, at laryngoscopy, after one minute, after five minutes and after fifteen minutes were 95, 89, 95, 97, 94 and 96 respectively. While analysing statistically, it was seen that mean

arterial pressure and mean heart rate are significantly altered at different time intervals among subjects of group A.

We found that mean heart rate (beats/min) at baseline was 86 and 87, at induction was 87 and 88, at laryngoscopy was 88 and 90, at one minute was 90 and 91, at five minutes was 88 and 89 and at fifteen minutes was 89 and 88. The mean arterial pressure (mm Hg) at baseline was 92 and 95, at induction was 102 and 88, at laryngoscopy was 96 and 90, at one minute was 98 and 94, at five minutes was 88 and 91 and at fifteen minutes was 94 and 90 in group I and II respectively. Aggarwal S et al<sup>11</sup> compared propofol and etomidate for their effect on hemodynamics and various adverse effects on patients in general anesthesia. 100 ASA I and II patients of age group 18-60 years scheduled for elective surgical procedure under general anesthesia were randomly divided into two groups of 50 each receiving propofol (2mg/kg) and etomidate (0.3mg/kg) as an induction agent. Demographic variables were comparable in both the groups. Patients in etomidate group showed little change in mean arterial pressure (MAP) and heart rate (HR) compared to propofol ( $p > 0.05$ ) from baseline value. Pain on injection was more in propofol group while myoclonus activity was higher in etomidate group. Their study concluded that etomidate is a better

agent for induction than propofol in view of hemodynamic stability and less pain on injection.

The limitation the study is small sample size.

## Conclusion

Authors found that etomidate found to be superior in comparison to propofol as an anaesthetic agent.

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