

# To Evaluate Different Doses of Intravenous Lignocaine on the Incidence of Etomidate Induced Myoclonus

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## Abstract

**Background:** Induction of anesthesia with etomidate results in dose-dependent myoclonus. The present study was conducted to evaluate different doses of intravenous lignocaine on the incidence of Etomidate induced myoclonus. **Subjects and Methods:** The present study was conducted in the department of Anesthesia. It comprised of 90 patients. Patients were divided into 3 groups of 30 each. In group I patients, 6 mL of normal saline was given and in group II patients, 0.5 mg/kg of lignocaine was given and in group III patients, 1 mg/kg lignocaine diluted to 6 mL (with NS) was given. The four-point intensity scoring was used. **Results:** Out of 90 patients, males were 45 and females were 45. Mean weight of patients in group I was 56.4 years, in group II was 60.4 years and group III was 58.9 years. ASA grade was I in 19 in group I, 20 in group II and 22 in group III. It was grade II seen in 11 in group I, 10 in group II and 8 in group III. Grade 0 was seen in 30% in group I, 55% in grade II and 60% in grade III, grade 1 was seen 20% in group I, 15% in group II and 20% in group III, grade 2 in 15% in group I, 20% in group II and 10% in group III, grade 3 was seen in 35% in group I, 10% in group II and 10% in group III. The difference was significant ( $P < 0.05$ ). **Conclusion:** Different doses of lignocaine resulted in variation in Myoclonus. It was observed that 1 mg/kg of lignocaine was effective than other doses in reducing the incidence of EM.

**Keywords:** Anesthesia, Etomidate, Myoclonus.

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## Introduction

Etomidate, a carboxylated imidazole, confers the advantages of better haemodynamic stability and less injection pain compared to propofol; when used for the induction of general anaesthesia.

However, etomidate-induced myoclonus (EM), seen in 50%–80% of unpremedicated patients, jeopardises its use. Etomidate is a non-barbiturate hypnotic that induces sedation through GABA receptors in the central nervous system. It has been used as an anaesthetic induction agent for more than quarter of a century.<sup>[1]</sup>

Induction of anesthesia with etomidate results in dose-dependent myoclonus in 50–80% of patients without premedication. In addition to increasing the risk of aspiration in patients with a full stomach, myoclonus may also increase intraocular pressures and cause problems in patients who will undergo open eye surgery. EM may vary from innocuous movements at finger to intense clonic movements.<sup>[2]</sup> These involuntary movements may lead to muscle damage, myalgia, hyperkalaemia, accidental dislodgement of the vascular access and monitoring devices. The EM may prove to be particularly hazardous in patients with open-globe injury, full stomach, hypertension, coronary artery disease and intracranial aneurysms.<sup>[3]</sup>

The incidence of myoclonus is reduced by one-half when pretreatment with 100 µg fentanyl 5 minutes before induction of anesthesia is made, but the incidence of apnea is increased. The most common adverse effects of Etomidate are Myoclonus and adrenal suppression.<sup>[4]</sup> The present study was conducted to evaluate different doses of intravenous lignocaine on the incidence of Etomidate induced myoclonus.

## Subjects and Methods

The present study was conducted in the department of Anesthesia. It comprised of 90 patients of both genders belonging to the American Society of Anesthesiologists' (ASA) physical status I or II and undergoing elective surgeries under planned general anaesthesia. All patients were informed regarding the study and written consent was obtained. Ethical approval was obtained prior to the study from institute.

Patient data such as name, age, gender etc. was recorded. Patients were divided into 3 groups of 30 each. In group I patients, 6 mL of normal saline was given and in group II patients, 0.5 mg/kg of lignocaine was given and in group III patients, 1 mg/kg lignocaine diluted to 6 mL (with NS) was given. The four-point intensity scoring (0)- No myoclonus; (1)- Mild myoclonus (mild movements of a body segment,

e.g., finger or a wrist only); (2)- Moderate myoclonus (mild movements of two different muscles and (3)- Severe myoclonus (intense tonic movements in two or more muscle groups was used for assessment of Myoclonus. Results were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table 1: Distribution of patients**

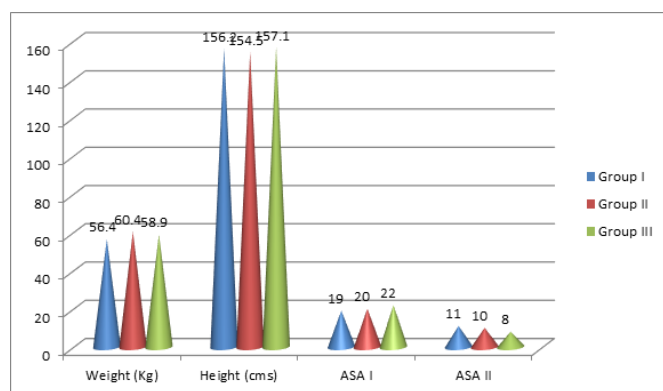
Total- 90		
Gender	Males	Females
Number	45	45

[Table 1] shows that out of 90 patients, males were 45 and females were 45.

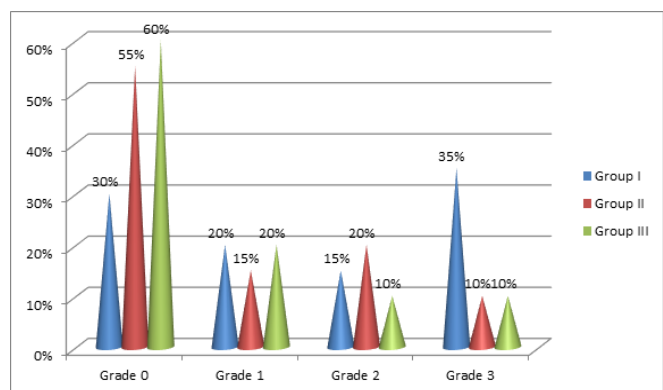
**Table 2: Parameters in all groups**

Parameters	Group I	Group II	Group III	P value
Weight (Kg)	56.4	60.4	58.9	0.61
Height (cms)	156.2	154.5	157.1	0.59
ASA I	19	20	22	0.72
ASA II	11	10	8	0.53

[Table 2] shows that mean weight of patients in group I was 56.4 years, in group II was 60.4 years and group III was 58.9 years. ASA grade was I in 19 in group I, 20 in group II and 22 in group III. It was grade II seen in 11 in group I, 10 in group II and 8 in group III. The difference was non-significant ( $P > 0.05$ ).



**Figure 1: Parameters in all groups**



**Figure 2: Prevalence of Myoclonus**

[Figure 2] shows that grade 0 was seen in 30% in group I, 55% in grade II and 60% in grade III, grade 1 was seen 20%

in group I, 15% in group II and 20% in group III, grade 2 in 15% in group I, 20% in group II and 10% in group III, grade 3 was seen in 35% in group I, 10% in group II and 10% in group III. The difference was significant ( $P < 0.05$ ).

## Discussion

Etomidate can be used as a sedative hypnotic agent. Etomidate is a carboxylated imidazole that depresses CNS via GABA. Because of its quick action, low profile for cardiovascular risk, minimal respiratory depression and reliable sedation, Etomidate is optimal for procedural sedation in the Emergency Room. Etomidate can act as a defensive role in cerebral and myocardial ischemia, has an easy dosing profile, limited ventilation suppression and decreased release of histamine for patients who are hemodynamically unstable. Etomidate is the inducing agent. In traumatic brain injury patients it reduces intracranial pressure and maintains normal arterial pressure. Etomidate is highly protein bound in blood.<sup>[5]</sup> The present study was conducted to evaluate different doses of intravenous lignocaine on the incidence of Etomidate induced myoclonus.

In present study, Patients were divided into 3 groups of 30 each. In group I patients, 6 mL of normal saline was given and in group II patients, 0.5 mg/kg of lignocaine was given and in group III patients, 1 mg/kg lignocaine diluted to 6 mL (with NS) was given. Sumalatha et al,<sup>[6]</sup> conducted a study in which 166 patients in the Emergency Department in whom Etomidate was used for procedural sedation were enrolled for the study. The mean age was observed to be 42 years among males and females. The mean cumulative dose was 0.3mg/kg. Premedication was not used, which increases the chance of detection of myoclonus. Full recovery to the preprocedural level of alertness was achieved within 30 mins in 160 (96%) of procedures. Mean changes in systolic blood pressure, pulse rate and oxygen saturation were clinically insignificant. Myoclonus was observed in 4 (2.4%) of 166 patients.

In present study, mean weight of patients in group I was 56.4 years, in group II was 60.4 years and group III was 58.9 years. ASA grade was I in 19 in group I, 20 in group II and 22 in group III. It was grade II seen in 11 in group I, 10 in group II and 8 in group III. Isitemiz et al,<sup>[7]</sup> found that the incidence of EM was significantly reduced in Groups III and IV compared with Group I. Lignocaine 1 mg/kg and 1.5 mg/kg significantly reduced the incidence of severe myoclonus at 2 min compared to Groups I and II.

It has been observed that lignocaine propensity to reduce the central nervous system excitability has been hypothesized as the mechanism behind its EM suppressing action. Studies have linked EM either to a seizure like activity or disinhibition phenomenon with earlier suppression of the cortical before subcortical activity. Disruption of the cortical GABA-mediated inhibition makes skeletal muscles susceptible to the spontaneous nerve transmissions, thereby leading to the myoclonic movements.<sup>[8,9]</sup>

We found that prevalence of Myoclonus was grade 0 seen in 30% in group I, 55% in grade II and 60% in grade III, grade 1 was seen 20% in group I, 15% in group II and 20% in

group III, grade 2 in 15% in group I, 20% in group II and 10% in group III, grade 3 was seen in 35% in group I, 10% in group II and 10% in group III. Limitation of the study is small sample size. Moreover different doses of lignocaine could have been provided different results.

## Conclusion

Different doses of lignocaine resulted in variation in Myoclonus. It was observed that 1 mg/kg of lignocaine was effective than other doses in reducing the incidence of EM.

## References

1. Voss LJ, Sleigh JW, Barnard JP, Kirsch HE. The howling cortex: Seizures and general anesthetic drugs. *AnesthAnalg* 2008;107:1689-703
2. Singh KA, Ruchi G, Singh AK, Kaur BT. Efficacy of lignocaine versus midazolam in controlling etomidate-induced myoclonus: A randomized placebo-controlled study. *Ain-Shams J Anaesthesiol* 2014;7:460-4.
3. Du X, Zhou C, Pan L, Li C. Effect of dexmedetomidine in preventing etomidate-induced myoclonus: A Meta analysis. *Drug Des DevelTher* 2017;11:365-70.
4. Van Keulen SG, Burton JH. Myoclonus associated with etomidate for ED procedural sedation and analgesia. *Am J Emerg Med* 2003;21:556-8.
5. Jain S, Khan RM. Effect of peri operative intravenous infusion of lignocaine on haemodynamic responses to intubation, extubation and post-operative analgesia. *Indian J Anaesth* 2015;59:342-7.
6. Sumalatha GB, Dodawad RR, Pandarpurkar S, Jajee PR. A comparative study of attenuation of propofol-induced pain by lignocaine, ondansetron, and ramosetron. *Indian J Anaesth* 2016;60:25-9.
7. Isitemiz I, Uzman S, Toptaş M, Vahapoglu A, Gül YG, Inal FY, et al. Prevention of etomidate-induced myoclonus: Which is superior: Fentanyl, midazolam, or a combination? A Retrospective comparative study. *Med SciMonit* 2014;20:262-7.
8. Sedighinejad A, NaderiNabi B, Haghighi M, Biazar G, Imantalab V, Rimaz S, et al. Comparison of the effects of low-dose midazolam, magnesium sulfate, remifentanyl and low-dose etomidate on prevention of etomidate-induced myoclonus in orthopedic surgeries. *Anesth Pain Med* 2016;6:31-33.
9. Gultop F, Akkaya T, Bedirli N, Gumus H. Lidocaine pretreatment reduces the frequency and severity of myoclonus induced by etomidate. *J Anesth* 2010;24:300-2.

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