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SHORT COMMUNICATION

Lower significant rate of etomidate-induced myoclonus for procedural sedation in emergency department of a tertiary care hospital

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ABSTRACT

Background: Etomidate drug is commonly used for procedural sedation in the emergency department (ED). The incidence rate of etomidate-induced myoclonus is 33%. **Aims and Objectives:** In this study, we aimed to contradict that etomidate-induced myoclonus is less significant than the reported incidence rate. **Materials and Methods:** This prospective study was performed between June 2016 and November 2016 in the ED of Amrita Institute of Medical Sciences, a tertiary care hospital. In the ED, procedural sedation was carried out by the physician. Adult patients receiving etomidate were enrolled for the study. **Results:** The presence of myoclonus was noticed, and its duration was reported using the myoclonus scale. A total of 166 (116 males and 50 females) patients enrolled in the ED for procedural sedation with etomidate were taken. The dose administered was 0.3 mg/kg. Myoclonus was observed in 4 (2.4%) of 166 sedations. The mean age was observed to be male and female. During procedural sedation, etomidate-induced myoclonus in ED was less significant than the reported values. **Conclusion:** From this, we came to the conclusion that the incidence to occur myoclonus with administration of etomidate is less when compare with other ED studies.

KEY WORDS: Etomidate; Myoclonus; Emergency Department

INTRODUCTION

In emergency settings, a set of drugs have been used in patients for procedural sedation,[1] of which etomidate is the choice that can be used as sedative hypnotic agents.[2] Etomidate is a carboxylated imidazole[3] that depress central nervous system through gamma-aminobutyric acid.[4] Due to its quick action, low profile for cardiovascular risk, minimal respiratory depression, and reliable sedation, etomidate is optimal for procedural sedation in the emergency department (ED).[5] Etomidate can act as a defensive role in cerebral and myocardial ischemia, easy dosing profile, limited ventilation suppression, and decreased the release of histamine,[6] and for patients who are hemodynamically unstable, etomidate is the inducting agent.[7] In traumatic brain injury patients, it reduces intracranial pressure and maintains normal arterial pressure[8]

Etomidate is highly protein bound in blood plasma, and it is metabolized by hepatic and plasma esterases.[9]

The most common adverse effects of etomidate are myoclonus and adrenal suppression. Others include nausea, vomiting, and pain at the injection site.[10] In both anesthesia and emergency literature, myoclonus with etomidate induction and sedation in ED has been described. In ED sedation doses, the reported incidence of etomidate-induced myoclonus is about 33%.[1]

Our study is to quantify that the incidence and people with etomidate-induced myoclonus are less than the reported percentage in the patients.

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MATERIALS AND METHODS

Here, we conducted a prospective study for 6 months between June 2016 and December 2016 at Amrita Institute of Medical Sciences, Kochi, a 1800-bedded tertiary care hospital. Patients who were subjected for sedation in the ED with etomidate were enrolled for the study. In our ED, the procedure was undertaken at the vigilance of the emergency physician. In the meantime, the patients cardiac, pulse oximetry, blood pressure, and end-tidal carbon dioxide monitoring were monitored according to the guidelines in the ED.

The data were collected and compiled using Microsoft excel. Demographics were recorded on each patient. The dose of etomidate was noticed. The observed result was the presence of the myoclonus. The informations were tabulated on the data sheet.

Selection and Description of Participants

All patients who were subjected for procedural sedation with etomidate are included in the study. Those who were pregnant, having neuromuscular disorder, having adverse reaction with etomidate, and who are unable to give the consent form were excluded from the study (Table 1).

Technical Information

In this study, patients who developed myoclonus after the administration of etomidate during procedural sedation in the ED. The severity of myoclonus developed in patients after the administration of etomidate was measured using the scale (Table 2). Cardiac, blood pressure, and pulse oximetry were recorded according to the guidelines of the ED.

Ethics

The data collection was done after the authorization from the research committee. The patients were chosen according to the exclusion and inclusion criteria.

Statistics

The percentage of patients with respect to various variables was computed, namely, age, sex, gender distribution, mean total of etomidate dose, severity of myoclonus, and time to onset of myoclonus after etomidate administration. Statistical significance was calculated using *P* value.

RESULTS

In our study of 166 (116 male and 50 female) patients, 4 (1 male and 3 female) patients developed myoclonus with the administration of etomidate during procedural sedation in ED. The *P* value obtained for this is 0.04765 (the result is significant at <0.05) which shows that study is statistically significant.

This study focuses on the lower significant rate of etomidate-induced myoclonus for procedural sedation in a tertiary care hospital. Other ED studies had shown that occurrence of myoclonus with etomidate ranges from 7 to 20%. The studies also showed that the occurrence of myoclonus is dose dependent (Table 3).

DISCUSSION

Yates et al. showed that myoclonus had developed about 75% of the patients. In our study, about 2.4% (4 out of 166 patients) of the patients developed myoclonus with etomidate which is of being in minor degree during procedural sedation in ED. The severeness of myoclonus was assessed using the scale as per Table 2. Patients who had developed mild-to-moderate myoclonus in the ED during sedation was less compared to other studies.

Table 1: Demographics

Parameters	Frequency
Number of patients	166
Number of procedural sedation	166
Age (mean), y	42
Male	116
Female	50
Weight (mean), kg	79
Height (mean), in	67

y: Years, kg: Kilogram, in: Inches

Table 2: Myoclonus scale used to assess the degree of myoclonus

0 - No myoclonus
1 - Mild myoclonus: Minor tremors or myoclonus of 1 extremity
2 - Moderate myoclonus: Myoclonus of 2-3 extremities
3 - Severe myoclonus: Involvement of all extremities or myoclonus severe enough to require extremity stabilization or premature termination of procedure

Table 3: Etomidate-induced myoclonus

Parameters	Value
Initial etomidate dose (mean) (mg/kg)	0.13
Mean total etomidate dose	0.15
Total number experiencing myoclonus	4
Mild	2
Moderate	1
Severe	1
Time to onset of myoclonus after etomidate administration (mean), s	52
Duration of myoclonus (mean), s	90

Several studies by Doenicke et al.[11] and Stockham et al.[12] show that the myoclonus can be abolished with administration of premedications such as benzodiazepines or Stockham et al.[12] In our study, we did not administered any premedications before the administration[13] of etomidate.

Furthermore, we were specifically looking for myoclonus which has increased our sensitivity to detect whether it happened or not. The rate of myoclonus was less, and the success of procedural sedations determined that the etomidate can be administered as a sedative agent for the patient for procedural sedation.

Since etomidate-induced myoclonus was less compared to other studies, it can be administered as sedative agent in ED for procedural sedations. Our study was carried out to show that the etomidate-induced myoclonus is less compared to the studies conducted by Yates et al.[3]

CONCLUSION

From this, we came to the conclusion that the incidence to occur myoclonus with the administration of etomidate is less when compare with other ED studies.

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