ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 08 | August - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARISION OF PRETREATMENT WITH ONDANSETRON VERSUS LIGNOCAINE FOR REDUCTION OF PAIN ON INJECTION OF ETOMIDATE.

Anaesthesiology

Dr. Bhavana Raval Associate Professor, Department Of Anesthesiology, B J Medical College, Ahmedabad-380016.

Dr Satkarjit Kaur Resident Department of Anesthesiology, B J Medical college, Ahmedabad -380016.

Dr Madhu H T* Resident Department of Anesthesiology ,B J Medical college ,Ahmedabad-380016. *Corresponding Author

Dr. Niki Jignesh Shah Resident Department of Anesthesiology, B J Medical college, Ahmedabad -380016.

Dr. Jyotshnamayee Mishra Resident Department of Anesthesiology ,B J Medical college Ahmedabad -380016.

ABSTRACT

Introduction: Every anesthetist takes a pain to reduce the pain of patient in all aspects as far as possible .All efforts by premedicating with different drugs to reduce the pain while injecting anesthetics drugs have been tried .Etomidate is one of the special induction agent available for use which has a unique property of hemodynamic stability but with a disadvantage of having a pain on injecting it, due to propylene glycol .A study to compare between premedication of lignocaine and ondansetron is conducted to reduce the pain on injection of etomidate . **Methods:**50 patients of 18 to 60 years of either sex belonging to American society of anesthesiologists physical status grade I and II undergoing general anesthesia were studied .Two 20 gauge iv cannulas were inserted in dorsum of both hands ,all patients were premedicated with inj.glycopyrrolate 0.004mg/kg and inj.Fentanyl 1-2mcg/kg both cannulas were flushed with 5ml NS, Venous drainage occluded by an elastic band .After preoxygenation ,study drugs were injected IV lignocaine (preservative free) 2ml 2% given in right hand ,iv ondandestron 2ml (4mg) given in left hand .The elastic band was removed after 1 minute ,patient was given Inj.Etomidate 2ml through each cannula ,pain assessment was done using Withdrawal response ,verbal rating score and behavioural signs. **Results:** In withdrawal response score 92 % of patient receiving lignocaine and 12% of patient receiving ondansetron showed No response ,8 % of patient of lignocaine exhibited wrist movement compared to 52% of ondansetron group .In verbal rating score 88% of patient receiving lignocaine exhibited no pain and 12 % mild pain whereas in ondansetron group 20 % had no pain and 56% had mild pain .In Behavioural signs 100% of patients receiving lignocaine showed no response ,in ondansetron group 64% showed no response and 36 % of them exhibited arm withdrawal. **Conclusion:** By our study it is concluded that pretreatment with lignocaine is better in comparision with ondansetron in reducing the pain of etomidate injection .

KEYWORDS

Lignocaine , Ondansetron , Etomidate , pain

INTRODUCTION

Various agents have been used for intravenous induction of anesthesia Etomidate is a special IV induction agent with unique hemodynamic profile ,that can be administered during induction of general anesthesia or sedation for short duration procedures .The IV administration of Etomidate up to 0.6mg/kg to patients with cardiovascular disease has little or no effect on myocardial metabolism ,cardiac output ,peripheral circulation or pulmonary circulation .These special properties of Etomidate comes with an unpleasant side effect of pain on injection .Different premedication with opioids ,local anesthetics ,cold saline, ondansetron , topical nitroglycerine ,topical lidocaine , NSAIDs have been tried over years to reduce or to completely abolish the side effect of pain.

Lidocaine pretreatment which is extensively used to reduce the pain of propofol injection is also used to reduce the pain of etomidate injection.

Ondansetron , a 5 H T antagonist ,block 5HT3 receptors and sodium channels and possess antinociceptive properties.

In prospective randomized control study ,we have tried to compare the efficacy of lignocaine and ondansetron in reduction of pain during injection of Etomidate during induction of anesthesia.

MATERIAL AND METHODS

After obtaining institutional ethical approval from Institutional ethical committee ,BJ Medical college and civil Hospital,Ahmedabad. 50 patients aged >18 years of either sex having ASA PS I and II,who are undergoing general anesthesia are selected .Patients who refused for study, having renal or hepatic dysfunction/failure, coagulation disorders, seizure disorders, Allergy to study medications, patients with disorders of lipid metabolism, patients with peripheral vascular disease, patients with chronic pain syndrome ,patients suffering from neuromuscular disorders, Hypothyroidism, diabetes Mellitus were excluded .

All patients were thoroughly examined preoperatively .Routine investigations were advised and verified on the day of surgery .After getting the written informed consent ,Patient were taken on OT table and ASA standard monitors attached , baseline vitals were recorded. TWO 20 gauge IV cannulas were inserted in to veins on the dorsum of both hands. Premedication of Inj.glycopyrrolate 0.04mg/kg IV ,inj .Fentanyl 1-2mcg/kg IV injected , vitals recorded after premedication .Both cannulas flushed with 5ml of Saline, Venous drainage occluded in both hands using elastic band ,IV lignocaine (preservative free) 2ml 2% given in Right hand (Group L),IV ondansetron 2ml (4mg) given in left hand(Group O) .The elastic band was released after 1 minute .patient was given Inj .Etomidate 2ml in each hand simultaneously and at the same rate. Pain assessment was done using WITHDRAWAL RESPONSE, VERBAL RATING SCORE, BEHAVIOURAL SIGNS.

1) Withdrawal Response Score

Degree of Movement	Patient Response
0	NO response or withdrawal
1	Movement at the wrist only
2	Movement /withdrawal of arm only
3	Generalised response ,withdrawal or movement in more than one limb ,cough ,breath holding.

2) Verbal rating score -4 point scale

0-No pain
1-Mild pain (pain reported only in response to questioning without any behavioural signs
2- Moderate pain (pain reported in response to questioning and accompanied by a behavioural sign or pain reported spontaneously without questioning)
3-severe pain (i.e. strong vocal response or response accompanied by facial grimacing ,arm withdrawal or tears)

3) Behavioural Signs

0-No response

1-Facial grimacing
2-arm withdrawal
3-Tears in eyes
4-Vocal response

Pain intensity was evaluated at 10 seconds ,20 seconds ,30 seconds ,40 seconds ,50 seconds and 60 seconds before induction of anesthesia ,after the assessment rest of the etomidate given as induction agent. Inj .succinylcholine 2mg/kg intravenously was given to facilitate tracheal intubation with suitable ET tube. Anesthesia was maintained under controlled ventilation with oxygen , sevoflurane (1 -1.5%) and vecuronium/ atracurium as Muscle relaxants .

Hemodynamic parameters were monitored and recorded at basal ,after premedication ,every 10 seconds up to 60 seconds after giving study drugs ,at the time of intubation and every 15 minutes till the end of surgery.

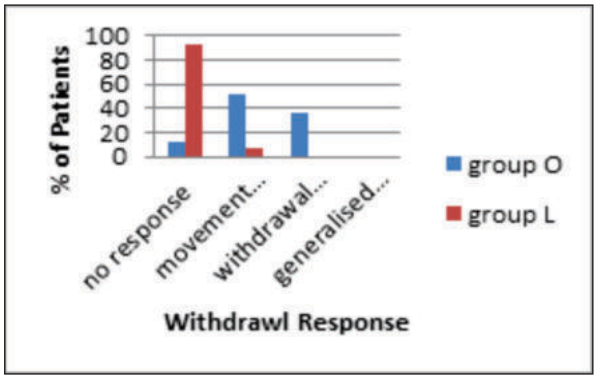
Residual neuromuscular block was reversed with Inj.Glycopyrollate 0.008mg/kg and ,Inj.Neostigmine 0.05mg/kg and Extubation was done after proper oral and endotracheal suction .Follow up taken till 24 hours after the surgery and observed for complications like pain ,edema, wheal ,flare response or swelling at the injection site.

Data And Statistical Analysis

The incidence of pain and number of patients experiencing pain and peri operative complication were compared by chi square test .All data were expressed as mean +/- sd which was calculated using Microsoft Excel . Data tables and graphs were also made in Microsoft excel . Data analysis was done by NCSS software .ANOVA test was applied to compare data .Statistical significance was defined as $p< 0.05$.

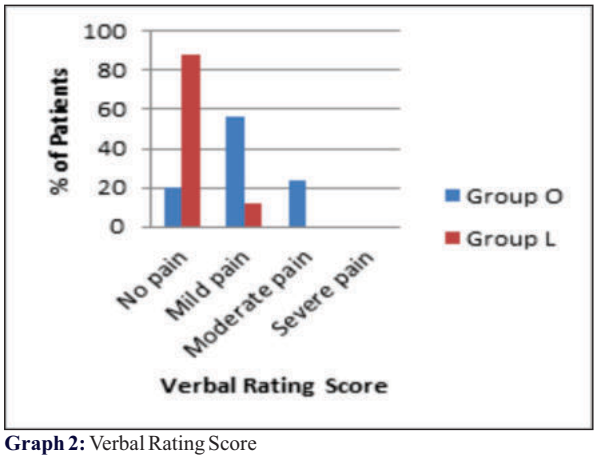
Mean age of the patients in the study was 31.16 ± 9.82 , Gender wise distribution includes 54% (27) Males and 46% (23) Females ,ASA 1 PS of 36%(18) and ASA 2 PS of 64% (32).

RESULT



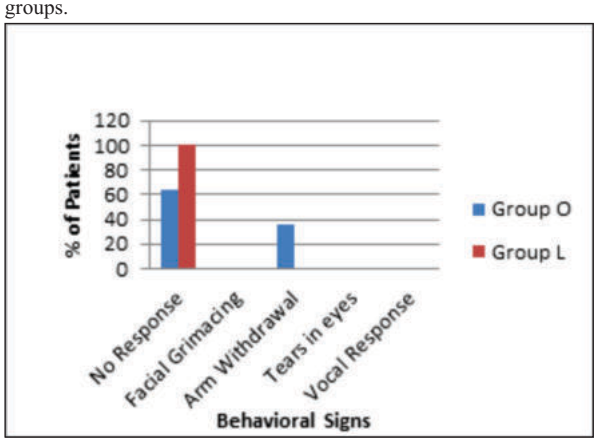
Graph 1: Withdrawl Response Score

P value<0.05 suggest that there was significant difference between two groups. 92% of patients in group L exhibited no response compared to 12% in group O. 8% of patients in group L exhibited movement of wrist compared to 52 % in group O.



Graph 2: Verbal Rating Score

P value <0.05 suggest that there was significant difference between two groups. 88% of the patient in group L exhibited no pain compared to 20% in group O. 12% of the patients in group L exhibited mild pain compared to 56% in group O. No patients exhibited severe pain in both groups.



Graph 3: Behavioral Signs

P value < 0.05 suggests that there was significant difference between two groups. 100% of patients in group L showed no response compared to 64% in group O. 36% of the patients in group O exhibited arm withdrawal compared to 0 in group L.

Perioperative complications - 5 Patients developed wheal following administration of ondansetron and before etomidate administration, 6 patients developed myoclonus following administration of etomidate.No other major complication was seen during intraoperative and postoperative period for 24 hours.

complications	WHEAL	MYOCLONUS
Number of patients	5(After Ondansetron)	6

DISCUSSION

Etomidate is a popular intravenous anaesthetic agent with unique hemodynamic profile,that can be administered during induction of general anaesthesia or sedation for short procedures.[1,2] The intravenous administration of up to 0.6mg/kg of Etomidate to patients with severe cardiovascular disease has little or no effect on myocardial metabolism, cardiac output, peripheral circulation or pulmonary circulation[3,4]. However, its use is limited by two major side effects, pain on injection and involuntary movements[25]. Pain on injection is distressing to the patient and it causes unnecessary stress during induction phase.[26]. Although the underlying mechanism is still not fully understood, the explanation for the pain included endothelial irritation, osmolality differences, unphysiological pH and the activation of mediators. The initial component of pain, involving immediate stimulation of nociceptors and free nerve endings seems to be associated mainly with the concentration of free drugs within the aqueous phase of the emulsion. The delayed component of pain appearing within half a minute, is also believed to result from interaction with nociceptors and free nerve endings and can be promoted by local vasodilatation and hyper permeability induced by bradykinins and prostaglandin E2[27]. Various methods, such as the administration of opioids, local anesthetics, cold saline and topical nitroglycerin, cooling the propofol to 4°C, ketamine, antiemetics, coinduction with thiopental sodium, tourniquet application, or lidocaine–prilocaine cream, topical lidocaine, aspirin and nonsteroidal anti-inflammatory drugshave been tried.[8-10]

Ondansetron is a commonly used drug to prevent Post operative nausea and vomiting. Ondansetron has been shown to bind to opioid mu receptors in humans and possess agonist activity[28].Five hydroxytriptamine receptors are involved in the nociceptive pathways and they play a pronociceptive role .Five hydroxytryptamine receptors are also a target for local anesthetics. This has interested many investigators in the way of thinking ondansetron as a pain reducing agent and therefore many studies are undertaken in this aspect.

Lignocaine ,a well known local anesthetic drug has been considered in this study ,Though exact mechanism of lignocaine reducing the injection pain is not known completely .It is proposed that pain reducing action of lignocaine is at both central and peripheral level .

Several mechanisms of antinociception have been proposed for low-dose systemic lidocaine, including actions on C-afferent neuronal activity , actions in the spinal dorsal horn , reductions of the postsynaptic depolarization mediated by N-methyl-D-aspartate receptors , and blocking peripheral and central voltage-gated sodium channels in the dorsal root ganglion . Intravenous lidocaine may also have antinociceptive actions by inhibiting several inflammatory activities, including p38 MAPK and NF-kB signaling pathways, and toxic oxygen-free radical production.

WITHDRAWL RESPONSE SCORE , VERBAL RATING SCORE and BEHAVIORAL SIGNS have been used in our study to compare the study drugs for their efficacy in reducing pain with injection etomidate.

AS these scores can predict the intensity of pain ,Though pain is a subjective phenomena. we believe as al l these scores are combined to come to a conclusion it will give the appropriate result.

CONCLUSION

This study showed that lignocaine pretreatment was better in preventing injection pain of etomidate than ondansetron during induction of anesthesia.

REFERENCES

[1] Brown PM,Moss E.Reduction of pain on injection of etomidate.Anaesthesia 1981;36:814-6
[2] Corssen G,Reves J,Stanlet T.Dissociative Anesthesia and Analgesia.Philadelphia:Lea and Febiger;1988
[3] Levins T.Etomidate in procedural sedation.Aie Med J.2011;30:45
[4] Bovill JG.Intravenous anesthesia for the patient with left ventricular dysfunction.Semin Cardiothoracic Vascular Anaesth.
[5] Mcculloch MJ,Less NW.Assessment and modification of pain on injection with etomidate.Anesthesia 1985;40;117-20
[6] Ambesh SP,Dubey PK,Sinha PK.Ondansetron pretreatment to alleviate pain on etomidate injection:A randomized controlled,double blind study Anesth Analog 1999.
[7] Vanacker B,Wiebalck A,Van Aken H,Sermeus L,Bouilon R,Amery A.Quality of induction and adrenocortical function,a clinical comparison of Etomidate-Lipuro and Hypnomidate.Anaesthetist 1993;42:81
[8] Madenoglu H,Akin A,Dogru K,Boyaci A.Ketamine for the prevention of pain due to injection of propofol.Erciyes Medical Journal.1996
[9] Johnson RA,Harper NJ,Chadwick S,Vohra A.Pain on injection of propofol.Methods of alleviation.Anaesthesia.1988;92:492
[10] Yokota S,Komatsu T,Komura Y,Et al.Pretreatment with topical 60% lidocaine tape reduces pain on injection of propofol.Anaesth Analog. 1997;85:672.
[11] Gregory RE, Ettinger DS.5-HT3 receptor antagonists for the prevention of chemotherapy induced nausea and vomiting. A comparison of their pharmacology and clinical efficacy.Drugs 1988;347:125
[12] R.A.Johnson,N.J.N Harper,S.Chadwick,A.Vohra.Pain on injection of propofol,Methods of alleviation.The Association of Anaesthetists of Cit Britain and Ireland.1990;45:439-442
[13] Gehan G,Karoubi P,Quinet F,Leroy A,Rathat C,Pouriat JL.Optimal dose of lignocaine for preventing pain on injection of propofol.Department of Anaesthesia,Paris University,Bobigny,France,1991;66(3):324-6
[14] Doenicke AW,Roizen MF et al, the hypothesis that the solvent for etomidate was a factor in the incidence of pain and other side effects after injection, and that these were associated with histamine release,1999;45;234-34.
[15] Halit Madenoglu,Karamehmet Yildiz, Kudret Dogru et Al, efficacy of different doses of lidocaine in the prevention of pain due to propofol,2003;431:34-78.
[16] Y.Nyman,K.Von Hofsten,C.Palm et al, a new lipid formulation of etomidate (Etomidate-R-Lipuro) which caused very little discomfort during I .V. injection,2006;341-45;66.
[17] Fatima Saricaoglu,Sennur Uzun,Oghuzan Arun et al, etomidate-lipuro and propofol and 50%, (1:1) admixture of these agents at induction with special reference to injection pain2011;322:45-67.
[18] Zahedi H, Maleki A, Rostami G et al, the effectiveness of ondansetron pre-treatment in alleviating propofol injection pain,2012;50(4):239-243
[19] A. Sunny,T.Veerabhadraiah,S.Trivikram et al, pre-treatment with lignocaine and ondansetron for pain on injection of propofol,2013;254:56-8.
[20] Mohhamad reza Safavi, Azim Honarmand, Ashraf Sadat Sahaf et al, pre-treatment with magnesium sulphate versus lignocaine for prevention of pain on etomidate injection,2013;564:67-78.
[21] Omid Azimaraghi, Yasama Aghajani, Maziar Molaghadimi et al,ondansetron reducing pain on injection of etomidate.2014;64:3:169-172
[22] Alireza Saliminia,Omid Azimaraghi,Amir Javedi et al, granisetron and lignocaine on reducing injection pain of etomidate,2015;345-76-88.
[23] Hesameddin Modir,Esmail Moshiri,Bijan Yazdi et al, the pain reduction efficacy of granisetron, dexmedetomidine and lignocaine after etomidate injection for surgery under general anesthesia,2019.103.94
[24] Nahla S EL Bahnawasy, the effect of addition of different doses of ondansetron(4 or 8 mg) to lignocaine as a component of intravenous regional anesthesia,2014,7:545-549
[25] King SY,Davis FM,Wells JE,Murchinson DJ.Lidocaine for the prevention of pain due to injection of etomidate.AnesthAnalog 1992;74:246-9
[26] Picard P,Tramer MR.Prevention of of pain on injection with propofol:A quantitative systemic review.Anaesth analog.2000;90:963-969
[27] Barann M,Gothert M,Fink K,et al.Inhibtion by anesthetics of 14C –guanidinium flux through the voltage gated sodium channel.
[28] Gregory RE,Ettinger DS.5-HT3 receptor antagonists for the preventin of chemotherapy induced nausa and vomiting.1998;55:173-32
[29] McCleane GJ,Suzuki R,Dienson AH.Does a single dose of 5-HT3 antagonist ondansetron have analgesic effect in neuropathic pain.Anaesth analog.2003;97:1474-8.