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EFFECTS OF INTRAVENOUS INFUSION OF DEXMEDETOMIDINE ON PERIOPERATIVE HEMODYNAMIC & POST OPERATIVE RECOVERY IN LAPAROSCOPIC SURGERIES

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KEYWORDS :

Introduction

Dexmedetomidine is a highly selective and specific α2-adrenoceptor agonist. By its central sympatholytic action, it promotes haemodynamic stability when used as adjuvant during general anaesthesia. It has analgesic and anaesthetic sparing property. It has potent sedative properties. The aim of the study is to assess the effect of intravenous dexmedetomidine on perioperative hemodynamic and also postoperative recovery in laparoscopic surgeries.

MATERIALS AND METHODS:

Inclusion criteria

- Age-18-55 yrs
- ASA1 & ll
- Informed written consent
- Posted for Laparoscopic surgeries

Exclusion criteria

- Known allergy to study drug
- ASA lll &lV
- Morbidly obese patients
- Significant neurologic, cardiac , renal, hepatic disease
- Uncontrolled HT
- Patients on adrenergic blocking drugs

Patients(60) were randomized into 3 groups
Group Allocation
Group 1(control)- Isoflurane, placebo infusion
Group 2(Dex 0.2)-Isoflurane, Dexmedetomidine 0.2μ/kg/hr
Group 3(Dex 0.4)-Isoflurane,Dexmedetomidine 0.4 μ/kg/hr

Study drug is prepared at concentration of 1μ/ml in 50ml syringe. Infusion is started 10min before inducti. Patients induced with inj.glycopyrrolate 5μ/kg, Fentanyl 2 μ/kg, Propofol 2mg/kg,Atracurium 0.5mg/kg. Maintanance with N2O:O2 2:2, Isoflurane 1-2 %, Atracurium in graded doses

MONITORING

Perioperative:

Pre anesthetic hemodynamic parameters were recorded. Hemodynamic parameters SBP, DBP, MAP, PR, and SpO2 monitored at regular interval intaoperatively, vitals maintained within 20% of baseline values by varying inspired isoflurane concentration. Hypotension (< 20 % baseline MAP) is treated initially by reducing isoflurane 0.5-1%, then with ephedrine 6mg bolus if required.

Hypertension (>20% baseline MAP) is treated by increasing isoflurane 0.5-1 %. Bradycardia <20% baseline heart rate-treated with inj.Atropine 0.6mg I.V bolus.Isoflurane & infusion of study drug is stopped at start of wound closure. Time to spontaneous eye opening, verbal response, and extubation recorded.

Postoperative:

Post operatively sedation score, pain score, nausea vomiting recorded. If patients complaints of pain, at VAS 6 rescue analgesia with Inj .Tramadol 50-100mg iv is given.

Time to discharge from PACU noted (Aldrete score 9)

Sedation score

1-Awake
2-sleepy , Arousable
3-sleepy, difficult to arousable

Aldrete score

Activity
- Able to move 4 extremities -2
- Able to move 2 extremities-1
- Able to move no extremities-0

Breathing
- Able to breathe deeply & cough freely-2
- Dyspnea-1
- Apnea-0

Circulation
- SBP 20% of preanesthetic level-2
- SBP 20-49% of preanesthetic level-1
- SBP 50% of preanesthetic level -0

Consciousness
- Fully awake-2
- Arousable-1
- Not responding-0

Results:

Dexmedetomidine infusion, 0.2, and 0.4μ/kg/hr , reduced the average inspired isoflurane concentration significantly. There was no change in recovery from anesthesia in both dexmedetomidine & control group. In Dexmed group hemodynamic parameters are well maintained (±20 % of baseline) with less than 0.6% of inspired concentration of isoflurane compared to control group which needed more than 1.2% of isoflurane concentration or rescue Esmolol infusion. The length of the PACU stay & rescue Tramodol administered is significantly less in Dexmed groups

Discussion:

Dexmedetomidine is a highly selective and specific α2 adrenoceptor agonist. By its central sympatholytic action, it promotes hemodynamic stability.It is a potent sedative & analgesic and anaesthetic sparing property without respiratory depression .Dexmedetomidine is eight times more specific for a2 receptors than clonidine (α2: r α1 ratio for Dexmedetomidine 1620:1 , for clonidine 220:1) Sedative and antinociceptive effects is by stimulation of in α2A locus coeruleus. Dexmedetomidine is only Food and Drug Administration approved for sedation of initially intubated and mechanically ventilated patients by continuous infusion for 24 h in the intensive care setting even in the post operative period.There are numerous clinical reports describing the "off label" use of Dexmedetomidine infusion as an adjuvant during and/or after surgery. Reports about dose-ranging studies are lacking for when the drug is administered as a continuous infusion during surgery and post operatie period as it varies with different surgeries.As the drug produces hypotension and/or bradycardia when it is administered it was important to determine an infusion rate that would maximize the anesthetic and analgesic-sparing effect while minimizing the occurrence of adverse cardiovascular side effects

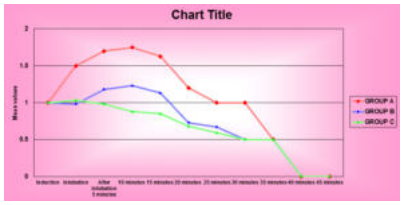
requiring therapeutic interventions (e.g., phenylephrine, labetalol). The reduced need for potent opioid analgesics and less severe emetic symptoms in the Dexmed groups probably contributed to the reduced PACU stay. Earlier studies like Burcu Tufangullari et al has shown that intra operative Dexmedetomidine infusion attenuated sympathetic response & reduced analgesic requirement ,length of stay in PACU which is consistent with our study. Chirag Ramlal Patel, in their study found there is delay in post operative recovery. But in our study we found that there was no delay in recovery

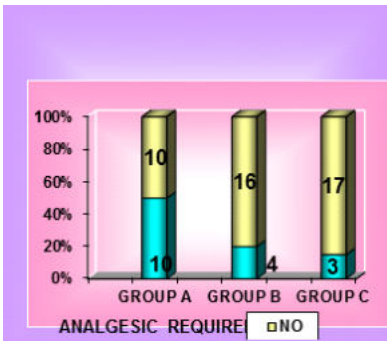
There is no significant change in mean arterial pressure and pulse rate between the three groups before and after intubation There is a decrease in use of isoflurane concentration in Group 3($p<0.0001$)

There is a decrease in time of ICU stay in Group 3($p<0.0001$)
The use of analgesics between the three groups:

Group 1&2	0.0479 Significant
Group 1&3	0.0204 Significant
Group 2&3	0.5 Not Significant

Changes in isoflurane concentration





Conclusion:

Adjuvant use of intra operative Dexmed infusion of both 0.2 & 0.4µ/kg/hr attenuated intra operative sympathetic stimulation,prevented hemodynamic instability S& reduced analgesic requirement, antiemetic therapy, and length of PACU stay.

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