Original Article

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Plain Lignocaine versus Lignocaine-Tramadol for Intravenous Regional Anaesthesia

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Abstract

Background: This study was conducted to compare efficiency of plain lidocaine with combination of adjuvant tramadol with lidocaine in intravenous regional anesthesia in terms of onset and duration of sensory and motar blockade. *Methods*: Sixty patients were divided in to 2 groups; the first group received 0.5% of 40 ml of plain lidocaine and the second group received 0.5% of lidocaine with tramadol 100 mg 40 ml. Preoperative and intraoperative hemodynamic parameters were monitored and recorded at 1,5,10,20,30,40 minutes after anesthesia. *Results*: The onset time of sensorial block was shorter and duration of sensorial block was longer in group 2 than group 1. The onset of motor blockade and duration of motor blockade was longer in group 2 than group 1. There was no comparatively significant differences in hemodynamic vital parameters in both groups. *Conclusions*: IVRA with addition of adjuvant tramadol ligocaine is effective and safer than the 0.5% ligocaine.

Keywords:

IVRA; 0.5%Lignocaine; Adjuvant Tramadol; Regional Anaesthesia.

Introduction

Intravenous regional anesthesia (IVRA) since its birth in the hands o august bier in 1908 has become a valuable instrument in the repertoire of anaesthesiologists. Its reliable, simpleand safe method of providing anaesthesia for minor surgical procedures to the extremeties if its administered by experienced clinician.

It is generally administered as low concentration –high volume local anesthestic solutionby intravenous route. Recently, administration of high concentration low volume local anesthestic solution has been suggested as an alternative.

It has been postulated that the site of action in ivra is probably by blockade of small nerves or possibly nerve endings and not the major nerve trunks[9,10].Tramadol is a centrally acting synthetic opioid that hasbeen widely used. It has weak agonist actions at the l-opioid receptor, releases serotonin, and inhibits the reuptake of norepinephrine [9,10].

Opioids possess local anesthetic properties in vitro [11]. Despite that the use of morphine [12] and fentanyl [13] showeda limited role, yet, meperidine enhanced lidocaine in IVRA [14]and proved efficacy when even used alone [15].

Materials and Methods

The study was conducted in RGSSH Hospital/RIMS raichur over a period of 1year between march 2015 to april 2016. It is a prospective randomized controlled study which included 60 patients of ASA GRADE 1 and grade 2 of either sex aged between 20 to 60 for below surgeries .

Patients with history of allery to local anaesthetics, local infection, raynauds disease, sicke cell disease, thromboplebhitis of limb and not willing for the procedure were excluded from the study.

All patients were premedicated with inj. midazolam 0.05mg/kg i.v 15-20 minutes before surgery. Initial pulse rate, blood pressure and arterial oxygen saturations were recorded. Patients were divided in to two groups group 1 who received 30-40ml of 0.5% lignocaine and group 2 who received 30-40 ml 0f 0.5%

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lignocaine+ 100mg tramadol based on toxic dose of lignocaine not exceeding 3mg/kg.

Technique of IVRA:two i.v cannulas were secured one with 20G cannula in the dorsum of non operating hand on its dorsum to which iv fluid fluid connected at the rate of 75-100 ml/hr and the other with 22G cannula on the dorsum of operating hand.the arm was elevated above the level of headfor 3 minute.exsanguination was done by an esmarch bandagefrom distal to proximal applying tightly.two pneumatic tourniquets are placed on the arm over cotton padding.the promimal tourniquet cuff was inflated to a pressure of 250 mm hg or 100mmhg above the systolic pressure of the patient and occlusion was confirmed by loss of radial pulse.

The first group received 0.5% of 40ml ml of plain lignocaine i.v and the second group received 40 ml of 0.5% lignocaine+100 mg of tramadol i.v.

The following intraoperative parameters of the patients, systolic blood pressure(SBP), diastolic blood pressure(dbp), mean blood pressure, heart rate(hr)peripheral oxygen saturation(spo2) were recorded at 1,5,10,20,30 and 40 minutes.the onset of sensory block was determined by loss of pain to the pinprick every 30 seconds after the injection of drug in dermatomal distribution of each nerve.the onset of motor block was noted when patient was unable to move fingers after injection of the drug. The recovery time for sensory bock was recorded when patient recovered the pain sensation to pinprick after tourniquet release.the recovery time for motor blockade was recorded when paient regained the fingers movement. The period from release of tourniquet to the administration of analgesic was taken as time of analgesic administration. The visual analog scale (VAS) was used to evaluate tourniquet pain at 0,5,10,15,20 and 40 minutes after tourniquet inflation.inj.fentanyl 1µg/kg i.v given when VAS>3.Ramsay Sedation Score(RSS)was used to evaluate degree of sedation in patients at 5,10,20,30 and 40 minutes after tourniquet deflation. Tourniquet was not deflated before 45 minutes of inj.lignocaine injection and was not inflated more than 65-70 minutes of inj.lignocaine injection.tourniquet was deflated using repeated inflation–deflation technique.

Statistical Analysis

In our study,sample size was calculated by pilot study.confidence level of 5% was considered.data were analyzed by using SPSS version 11 and data were expressed as mean±standard deviation as number.paired t- test and chi-square (x2) were applied when appropriate. $p< 0.05$ was considered significant and $p<0.01$ was considered very significant.

Results

In the study there were no significant differences for demographic data among groups and tourniquet time (Table 1).

Onset time for both sensory and motor block were signicantly shorter and longer in Group 2 than in Group 1($p<0.00001$). The recovery time for sensory and motor block were significantly longer in Group 2 compared to Group 1($p<0.05$) the incidence of complications in the study were few and statistically insignificant.

Haemodynamic parameters such as systolic blood pressure(SBP), diastolic blood (DBP), mean arterial blood pressure and arterial oxygen saturation (SPO2) for both groups were similar at 1,5,10,20,30 and 40 minutes ($p>0.05$)which is clinically significant

Discussion

Regional anaesthesia holds an important place in developing countriesbecause of its simplicity, safety and economy for anaesthesia of hand and forearm, intravenous regional anaesthesia, also called biers block, was first described by german surgeon august bier in 1908 [1].

Intravenous regional anaesthesia has since evolved as asafe,reliable, and cost effective technique for providing anaestheisa as well as bloodless field during upper limb surgery [2,3].

The onset time of sensory block in group 2 was 3.00±0.83 minutes as compared in group 1 4.57±0.62 minutes which was clinically significant ($p<0.05$).

The onset time of motor block in our study was 6.00±0.83 minutes in group 2 and in group1 was 8.00±0.83 minutes.the different between two groups was found to be significant $p<0.05$.

In a study done by Mir A et al, the onset time of sensory and motor blockade was 5.35±1.18minutes and 7.55±1.38minutes respectively using 0.5% lidocaine [4].

The recovery time of sensory block (from the time of administration of the drug) was 53.50±3.51minutes in group 2 and in group1 it was 46.00±2.55minutes.

The recovery time of motor bock in Group 2 was 56.83±3.91 minutes and in Group 1 it was 47.50±1.73 minutes.

In a study Ulus A et al found that the onset time and duration of sensory and motor block was shorter and longer in group receiving 2% lidocaine (12-15ml) than in group who received 0.5% 0f 30-50ml of lidocaine [5].

Regarding the complications, additional opioid requirement was seen in one patient in Group 1 and two patients in Group 2 respectively. Two patients in Group1 complained of nausea and vomiting whereas one patient in Group 2. Clinically there was no significant difference among two groups p>0.05.

Complications with intravenous regional anaesthesia were local anaesthetic toxicity, tourniquet pain, lack of post operative analgesia. Various modalities were tried to overcome these disadvantages like change of local anaesthetic, modification of technique and addition of adjutants [6].

Conclusion

Intravenous regional anaesthesia with 0.5% of 40 ml of lignoocaine +100 mg tramadol is effective and safer with early onset time of sensory and motor blockade along with longer duration of sensory and motor blockade as compared to 0.5% of 40 ml of plain lignocaine.

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