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COMPARISON OF CLONIDINE VERSUS FENTANYL AS ADJUVANT TO LEVOBUPIVACAINE FOR EPIDURAL LABOUR ANALGESIA

Anaesthesiology

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ABSTRACT

INTRODUCTION:.Epidural route is probably the most commonly used method for achieving labour analgesia Present study was conducted to compare the effect of Clonidine versus Fentanyl as an adjuvant to Levobupivacaine for epidural labour analgesia in respect to quality and duration of analgesia, total dose required and safety. **MATERIAL AND METHODS:** Eighty pregnant women received bolus epidural Inj Levobupivaciane (0.125%) plus Inj Fentanyl (25 microgram) in Group A. and bolus epidural Inj Levobupivaciane (0.125%) plus Inj Clonidine (50 microgram) in Group B. **RESULTS:** There was early onset of action and significantly longer duration of action in group B as compared to group A. The total dose of local anaesthetics required was less in group B as compared to group A. **CONCLUSION:** Clonidine can be preferred as an adjunct in labour analgesia with Levobupivacaine as it provides early and longer analgesia than Fentanyl

KEYWORDS

Epidural Labour Analgesia, Levobupivacaine, Clonidine, Fentanyl

INTRODUCTION

Labour pain is the most intense pain a woman might experience in her life time and hence requires adequate pain relief.[1] Merskey has defined Pain as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage"[2]. Adequate pain relief should be considered basic human right. Failure to relieve pain is morally and ethically unacceptable.[3] Excessive pain during active labour leads to maternal stress, increased uterine contractility, hypo perfusion of feto-placental unit, fetal hypoxia &acidosis, increased oxygen demand and mechanical workload. All this results in catecholamine release leading to uterine vaso-constriction.These responses can be reduced by adequate analgesia during labour.

Neuraxial techniques are the gold standard for intra-partum labour analgesia. Epidural route is probably the most commonly used method for achieving labour analgesia. The present study was designed to find out which one out of Fentanyl and Clonidine is superior, as an adjuvant to Levobupivacaine for epidural labour analgesia in respect of quality of analgesia, duration of analgesia, total dose required and maternal and fetal safety.

MATERIAL AND METHODS

Total 80 pregnant women of age group between 18 to 35 years, without any co-morbidities willing for labour analgesia were included in the study. Patients who received bolus epidural Inj Levobupivaciane (0.125%) and Inj Fentanyl (25 microgram) ,total volume of 10cc were included in Group A. Patients who received bolus epidural Inj Levobupivaciane (0.125%) and Inj Clonidine (50 microgram), were included in Group B. Maternal blood pressure, maternal heart rate, FHR, cervical dilatation, Visual Analog Score (VAS) and Numerical Rating Scale (NRS) was measured every 5 minutes till the onset of analgesia after the administration of bolus dose. Study subjects were given top up dose of 3ml containing same combination of drugs when NRS>4. Maternal blood pressure, maternal and fetal heart rate, were monitored every 15 minutes till the delivery of fetus.

RESULTS

There was a significant difference between mean values of total dose of Inj.Levobupivacaine, and the total number of top ups required in Group A as compared with Group B (p=0.001). The total dose of local anaesthetics required and total number of top ups required was less in group B as compared to group A. There was a significant difference between mean values of duration of onset of analgesia, duration of action of bolus dose and duration of active labor when Group A compared with Group B (p=0.0001). There was early onset of analgesia and significantly longer duration of action in group B as compared to group A. The duration of labor was significantly shorter in group B as compared to group A. There was no significant difference found in modes of delivery among the two groups. There was no significant difference found in FHS and APGAR scores among the two groups.

In Group A, duration of onset was 19.12 ± 2.50 minutes, duration of action of bolus dose was 69 ±20.03 minutes, and duration of active labour was 157.88 ±40.48 minutess. In Group B, duration of onset was 16.62 ± 2.62 minutes, duration of action of bolus dose was 79.87±23.13 mins, and duration of active labour was 127.87 ±38.72 minutes. By applying Z test of difference between two means there is a significant difference between mean values of duration of onset of analgesia, duration of action of bolus dose and duration of active labour when Group A compared with Group B (p=0.0001)

In group A, the average dose of Inj.Levobupivacaine was 17.28±3.18 ml, And that of Inj. Fentanyl was 42.81±8.61mcg.In group B , the average dose of Inj.Levobupivacaine was 13.98 ±1.85 ml and that of Inj Clonidine was 70.63 ±9.42 mcg.The average of total number of tops in group A was 2.43 ±1.13 and in Group B was 1.38 ±0.63. By applying Z test of difference between two means there is a significant difference between mean values of total dose of Inj.Levobupivacaine , and the total number of top ups given when Group A compared with Group B (p=0.001)

Sensory level assessment mean time at which L_2 block is achieved in Group A and Group B showed that in group A , the mean time required to achieveL2 level sensory block was 20± 0.3 minutes and in Group B it was 15 ±0.1 minutes. Significant Difference was found in mean time for L2 blocks between the two groups.

DISCUSSION

i- Onset of action: In the present study In Group A, duration of onset was 19.12±2.50 minutes and in Group B, it was found to be16.62 ±2.62 minutes. Hence the duration of onset was found to be significantly shorter in Levobupivacaine with clonidine combination. In a study conducted by Mishra PK et al[4]Group 1 received 10 ml. of 0.125% isobaric levobupivacaine with 25µg fentanyl and group 2 received 10 ml of 0.125% isobaric levobupivacaine with 60 µg clonidine. Onset of analgesia was earlier in levobupivacaine with clonidine combination and was statistically significant (p=0.001). Clonidine combined with levobupivacaine has a faster onset of sensory and motor block which was in accordance with Milligan KR et al, Gupta S et al and Jain A et al. Chalkiadis DS et al[5] in their study demonstrated the absorption characteristics of epidural levobupivacaine with clonidine and adrenaline via caudal epidural route and showed that clonidine mixed with levobupivacaine had a faster absorption compared to adrenaline mixed with levobupivacaine.

ii-Duration of action : In the present study, duration of action of bolus dose in group A was 69.0 ±20.03 minutes and that in group B was 79.87±23.13minutes.Duration of action was prolonged significantly in Clonidine group as compared to the Fentanyl group.In the study done by Syal k et al [6,] Group I received 10 ml Bupivacaine (0.125%) alone, whereas Group II received 10 ml bupivacaine (0.125%) along with Clonidine (60 µg) as first dose. Duration of analgesia was significantly prolonged in group II (126 vs 97 minutes), due to analgesic properties of clonidine. These results co relate with the results of the present study. In a study conducted by Kizilarslan et al[7],Duration of analgesia after the first injection was longer in the bupivacaine-clonidine group when compared with the bupivacaine-fentanyl group with 139.4 ± 31 and 127.9 ± 48 minutes respectively. The difference was not significant (P = 0.42). The duration of labour and mode of delivery were also similar in both groups.

iii-Duration of labour : In the present study, duration of labour was 157.8 ±40.4 minutes in Group A and 127.87±38.72 minutes in group B. It was found to be less in Levobupivacaine with Clonidine combination as compared to fentanyl Group , which can be due to multiple reasons. Approximately 12 % of the patients delivered with ventouse assisted delivery , that also could have contributed to shorter duration of labour in group B. In a study done by Syal K et al [6,]addition of clonidine to bupivacaine did not affect the duration of labour, i.e. it remained similar to labour analgesia with bupivacaine alone, in consistence with other studies. Whereas the study conducted by Cigarini I [8]and others, two groups of pregnant healthy women were allocated randomly to receive either 10 mL 0.125% bupivacaine plain solution (group B, n = 10) or with 75 micrograms clonidine (group B + C, n = 12).It was found that addition of clonidine to bupivacaine increases the duration of labour. This may be due to higher dose of clonidine used in their study (75 µg).

iv-Number of Top up doses: In the present study, while comparing the total dose of epidural drugs and the total number of top ups required in the two groups,it was found that the average of total number of top ups in group A was 2.43 ±1.13and in Group B was 1.38 ±0.63. By applying Z test , there is a significant difference between mean values of total dose of Inj.Levobupivacaine, and the total number of top ups given were more in Levobupivacaine with fentanyl combination as compared with Clonidine. (p=0.001).Study done by Kizilarslan et al[7] showed that in the clonidine group, the frequency of 'top ups' was 1.80 ± 1.0 and in the fentanyl group 2.47 ± 1.0. The difference was just significant (P = 0.04). Because less additional doses were necessary in the clonidine group, total bupivacaine use was significantly less in this group compared with the fentanyl group (22.5 ± 12.5 mg and 30.9 ± 12.8 mg respectively; P = 0.04). Findings were similar to the present study.In a study done by Syal k et al [6,] it was found that addition of clonidine to Bupivacaine reduced the total amount of Bupivacaine required significantly. These findings co-related well with the findings of the present study.

v-Complications and Side effects: In the present study, there were no complications seen in both the groups. Hypotension and nausea were more common with Clonidine and Levobupivacaine combination as compared to fentanyl and Levobupicavaine combination, but the difference was statistically insignificant. A study conducted by Kizilarslan et al [7] concluded that two patients in each group had significant hypotension which responded satisfactorily to fluid replacement and injection of ephedrine. A decrease in arterial pressure may occur due to effective epidural analgesia. The effects of epidural clonidine on cardiovascular system are dose related. This finding differed from the present study because the dose of clonidine used in their study was higher than the present study.

CONCLUSION

Levobupivacaine is an S (-) enantiomer to bupivacaine with a less cardiotoxicity and neurotoxicity and has a promising safety profile for the patients. Clonidine can be preferred over Fentanyl as an adjunct in labour analgesia with Levobupivacaine,as it provides early and longer analgesia than Levobupivacaine with fentanyl combination. It also has local anaesthetic sparing effect without any significant side effects.

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