International Journal of Life Sciences, Biotechnology and Pharma Research Vol. 8, No. 1,January-June 2019 Online ISSN: 2250-3137
Print ISSN: 2977-0122

Original Research

Comparative Efficacy Evaluation of Epidural Bupivacaine-Fentanyl and Bupivacaine-Clonidine Used in Pelvic Surgeries for Post Operative Pain Relief at a Tertiary Care Centre

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Received Date: 22 April 2019 Accepted Date: 07 June 2019

Abstract

Background: One of the significant challenges encountered in pelvic surgery is the accurate identification of pelvic structures. Spinal anesthesia is the most commonly used technique for lower abdominal surgeries as it is very economical and easy to administer. Hence; the present study was conducted for comparative efficacy evaluation of epidural bupivacaine-fentanyl and bupivacaine-clonidine used in pelvic surgeries for post operative pain relief.

Materials & Methods: A total of 100 patients were enrolled and were randomized into two study groups as follows: Group A: 50 patients - Epidural Bupivacaine- Fentanyl, and Group B: 50 patients - Epidural Bupivacaine- Clonidine. Complete demographic and clinical details of all the patients were obtained. Postoperative pain was assessed over 8 h using Visual Analogue Scale (VAS). The frequency of rescue analgesia, sedation score along with events like nausea, vomiting, shivering or pruritus were also recorded. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: Mean age of the patients of group A and group B was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. Significant proportion of patients of both the study groups were of ASA grade II. Mean VAS was significantly lower among patients of group B in comparison to patients of group B. Mean duration of analgesia was 432.8 mins among patients of group A and was 456.5 mins among patients of group B.

Conclusion: Clonidine is a superior option as an adjunct to epidural bupivacaine hydrochloride for postoperative pain management due to its ability to extend the duration of analgesia.

Key words: Bupivacaine, Clonidine, Pelvic.

INTRODUCTION

One of the significant challenges encountered in pelvic surgery is the accurate identification of pelvic structures. Previous surgical interventions, pelvic infections, and radiation therapy can collectively lead to substantial anatomical distortion, often obscuring critical structures such as the rectal stump, bladder, vagina, and ureters beneath a dense layer of pelvic peritoneum. An inexperienced surgeon might mistakenly perceive the pelvis as devoid of contents; however, a thorough bimanual examination is essential to ascertain the existence of the rectal stump or vaginal cuff. The subsequent techniques may prove beneficial in locating structures within the pelvic environment.[1, 2]

Spinal anesthesia is the most commonly used technique for lower abdominal surgeries as it is

very economical and easy to administer. The addition of fentanyl to hyperbaric bupivacaine improves the quality of intraoperative and early postoperative subarachnoid block. The addition of opioids to local anesthetic solutions have disadvantages, such as pruritus and respiratory depression.[3, 4]

Spinal anesthesia has been used for a long time to produce sensory analgesia for surgeries below the level of the umbilicus. Intrathecal clonidine has been extensively evaluated as an alternative to neuraxial opioid for control of pain and has proven to be a potent analgesic, free of at least some of the opioid-related side-effects.[5,6] Hence; the present study was conducted for comparative efficacy evaluation of epidural bupivacaine-fentanyl and bupivacaine-clonidine used in pelvic surgeries for post operative pain relief.

MATERIALS & METHODS

The present study was conducted for comparative efficacy evaluation of epidural bupivacaine-fentanyl and bupivacaine-clonidine used in pelvic surgeries for post operative pain relief. A total of 100 patients were enrolled and randomized into two study groups as follows:

Group A: 50 patients - Epidural Bupivacaine-Fentanyl, and
Group B: 50 patients - Epidural Bupivacaine-Clonidine.

Complete demographic and clinical details of all the patients were obtained. Postoperative pain was assessed over 8 h using Visual Analogue Scale (VAS). The frequency of rescue analgesia, sedation score along with events like nausea, vomiting, shivering or pruritus were also recorded. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software. Chi-square test and Mann Whitney U test were used for evaluation of level of significance.

RESULTS

Mean age of the patients of group A and group B was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. A significant proportion of patients of both the study groups were of ASA grade II. Mean VAS was significantly lower among patients of group B in comparison to patients of group B. Mean duration of analgesia was 432.8 mins among patients of group A and was 456.5 mins among patients of group B.

Table 1: Demographic details

Variable	Group A	Group B
Mean age (years)	41.8	43.9
Males	31	32
Females	19	18
ASA grade I	12	15
ASA grade II	38	35

Table 2: VAS

VAS	Group A	Group B
Mean	3.8	1.5
SD	1.2	0.8
p-value	0.001 (Significant)	

Table 3: Duration of analgesia

Duration of analgesia (mins)	Group A	Group B
Mean	432.8	456.5
SD	56.8	51.7
p-value	0.001 (Significant)	

DISCUSSION

Postoperative pain management represents a critical aspect of anaesthesia practice. An optimal epidural analgesic approach for abdominal surgery should ensure effective pain control, minimize adverse effects, and enhance patient satisfaction. To improve analgesic efficacy while reducing side effects, additional agents such as opioids, ketamine, clonidine, or benzodiazepines may be incorporated into epidural infusions. A technique is considered effective if it extends postoperative analgesia following an epidural block, which can be achieved by introducing various adjuvants to local anesthetics, such as bupivacaine hydrochloride. When comparing the efficacy of analgesia, the combination of a local anesthetic with an opioid administered via the epidural route has been shown to provide superior pain relief compared to opioid analgesia delivered through intravenous or epidural methods.[7- 10] Hence; the present study was conducted for comparative efficacy evaluation of epidural bupivacaine-fentanyl and bupivacaine-clonidine used in pelvic surgeries for post operative pain relief.

Mean age of the patients of group A and group B was 41.8 years and 43.9 years respectively. Majority proportion of patients of both the study groups were males. A significant proportion of patients of both the study groups were of ASA grade II. Mean VAS was significantly lower among patients of group B in comparison to patients of group B. Mean duration of analgesia was 432.8 mins among patients of group A and was 456.5 mins among patients of group B. Agrawal J et al analyzed efficacy and safety of 100 μg clonidine and fentanyl as an adjuvant to 20 ml of 0.5% bupivacaine hydrochloride for postoperative pain. A prospective study was done on 90 patients belonging to American Society of Anesthesiology (ASA) grade I or II, who were referred for major lower abdominal surgery. Patients were randomly divided into three groups (30 patients each) to receive: 2ml of normal saline (Group B) or 100 μg of clonidine (Group BC) or100 μg of fentanyl (Group BF) as an adjuvant to 20 ml of 0.5% bupivacaine hydrochloride. Postoperative pain was assessed over 8 h using Visual Analogue Scale (VAS). The frequency of rescue analgesia, sedation score along with events like nausea, vomiting, shivering or pruritus were also recorded. Significantly less pain was noted in Group BC compared to Group BF. Out of 30 patients in each group, 93.34% in Group B, 90% in Group BC and 86.67% in Group BF had sedation score of zero. Episode of nausea and vomiting were less in all groups. Pruritus was found in 20% patients of Group BF.[11] Chopra P et al ascertained if a small dose of clonidine (30 μg) when added to a bupivacaine-fentanyl mixture improves spinal analgesia, without producing side effects, as compared to a bupivacaine-fentanyl or a bupivacaine-clonidine mixture. 75 (American Society of Anesthesiologists) ASA grade I-II patients, aged between 45 and 65 years, who were scheduled for vaginal hysterectomy with pelvic floor repair or non-descent vaginal hysterectomy under spinal anesthesia were recruited. The patients received hyperbaric bupivacaine (2.3 ml) with fentanyl 15 μg (Group BF) or clonidine 30 μg (Group BC) or both fentanyl (15 μg) and clonidine (30 μg) (Group BCF). The total amount of intrathecal mixture was constant (2.8 ml) in all the groups. Duration of sensory, motor block and effective analgesia, hemodynamic profile, postoperative pain score and analgesic requirements were recorded. The duration of effective analgesia, mean time till two-segment regression, and duration of sensory and motor block were significantly longer in group BCF as compared to group BC (P ~ 0.002), and in group BC as compared to group BF (P ~ 0.01). The incidence of intraoperative pain and requirement of postoperative analgesics in the first 24 hours was significantly more in group BF as compared to the other groups (P ~ 0.01). There was no difference in the hemodynamic profile between the groups. Low-dose clonidine (30 μg) when added to a bupivacaine-fentanyl mixture increased the duration of effective analgesia and the duration of sensory and motor block in gynecological surgery.[12]

CONCLUSION

Clonidine is a superior option as an adjunct to epidural bupivacaine hydrochloride for postoperative pain management due to its ability to extend the duration of analgesia.

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