



ROLE OF DEXMEDETOMIDINE IN TRANVERSUS ABDOMINIS PLANE BLOCK WHEN ADDED TO BUPIVACAINE: A PROSPECTIVE TRIAL

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ABSTRACT

Transversus abdominis plane (TAP) block is one of the multiple modalities in anaesthetic practice to reduce postoperative pain in abdominal surgeries. It is especially useful in patients in whom epidural block is contraindicated. TAP block is a relatively easy block to perform. It can be performed as a blind procedure as well as ultrasound guided. When used with adjuvants that duration of pain free period can be increased for several hours and thereby patient comfort level raised which ultimately leads to faster healing, early mobilization and discharge of the patients. One of these adjuvants is Dexmedetomidine, an α_2 adrenergic agonist. This study was conducted to study the effect of Dexmedetomidine when added as an adjuvant to 0.25% Bupivacaine in TAP block, in terms of quality as well as duration of block.

KEYWORDS : TAP block, dexmedetomidine, postoperative analgesia, sedation.

INTRODUCTION:

Introduced by Rafi in 2001, TAP block is a field block.¹ Its is a type of block that involves innervations of the anterolateral abdominal wall derived from T6-L1.² It is commonly used for postoperative analgesia after lower abdominal surgeries, like total abdominal hysterectomies, cholecystectomy, reteropubic prostetomy, appendectomy etc.^{3,4,5,6} It is very easy to perform because it does not need very difficult technical learning and can be performed blindly. With advanced imaging techniques, now a days it is also performed using ultrasonography (USG) guided technique.⁷ It is particularly suitable for patients in whom epidural analgesia is contraindicated or who refuse for epidural catheterisation. Dexmedetomidine is a d-isomer of medetomidine, a very potent drug which is used perioperatively for pain relief and sedation. It is an α_2 adrenergic receptor agonist which has been used as adjuvant to local anaesthetic drugs very commonly. It can be used intravenously, intrathecally as well as in peripheral nerve blocks.^{8, 9,10,11,12} Postoperative pain is a dreaded fear in surgical patients, impacting recovery and discharge from the hospital. It is imperative that preemptive blockade of postoperative pain should be done to ease patient comfort.

OBJECTIVE:

Objective of the study was to compare the effect of 0.25% bupivacaine plus Dexmedetomidine with plain 0.25% bupivacaine in TAP block on analgesic duration, requirement of total analgesic in 24 hours, postoperative sedation and hemodynamic parameters.

MATERIALS AND METHOD:

Study was carried out in JK hospital and Medical Research Centre, from February 2017 to February 2018, in patients of total abdominal hysterectomies. 60 patients of ASA I and ASA II grade between 18 years to 60 yrs were selected. Inclusion criteria were:

- Patients in whom epidural catheterization was contraindicated (those with deranged coagulation profile or on dual antiplatelet therapy)
- Patients who refused to take epidural anaesthesia

Excusion criteria were: patients allergic to local anaesthetics, those on α_2 adrenergic receptor blockers. Patients with history of uncontrolled hypertension and cardiovascular disease were also excluded from study.

Patients were randomly divided into two groups of 30 patients each : Group BD in which block was performed using plain bupivacaine (BupicaineTM) 0.25% 20ml plus dexmedetomidine (DextomidR Neon laboratories) 0.5mcg /kg in 2ml saline, and Group BS in which

block was performed using bupivacaine 0.25% 20ml plus 2ml normal saline.

Patients were explained the procedure in their language and a proper written informed consent was taken.

Randomization of patients done using sealed envelope technique. Drugs were prepared and labeled by anaesthetist who was not involved in the study. Patient data were recorded by resident posted in post operative ward who was unaware of randomization and patient grouping.

Fasting and premedication guidelines were followed as per protocol. In operation theatre monitor (Schillers Truscope II) was connected, and basic hemodynamic readings were noted. Premedication was done with iv glycopyrolate 0.2mg, iv midazolam 1mg and after preoxygenation with 100% oxygen for 3 minutes iv fentanyl 2mcg/kg was given. Induction of anaesthesia was done with IV propofol 2mg/kg body wt, IV atracurium 0.5mg/kg used for muscle relaxation, endotracheal intubation done with appropriate sized tube. After confirming the tube position surgery started. Anaesthesia was maintained using isoflurane 1% +O₂+N₂O mixture.

At the end of the surgical procedure, all aseptic precautions were taken, the ultrasound probe covered with a sterile cover and with Tegaderm (3M sterile dressing), was placed in a transverse plane to the lateral abdominal wall in the midaxillary line, between the lower costal margin and iliac crest. After identifying the transverses abdominis and internal oblique muscle, the plane was reached by using a 23 gauge spinal needle. Needle tip position was confirmed by injecting 2 ml of saline. A total dose of 11 ml of Drug solution was injected bilaterally in both the groups. After extubation the patients were shifted to postoperative care unit and different parameters were recorded at different interval of time: at the time of block application, 1hr,4hr,8hr,12hr,18hr,24hr . Following parameters were recorded:

- Heart rate and mean arterial pressure(MAP)
- Sedation score
- Time of request of first analgesic
- Total analgesic consumption

Sedation scores were assessed using Ramsay sedation score.¹³ Pain assessment was done using visual analogue scale (VAS), on a scale of 1-10, where 1- no pain and 10 is worst possible pain. If VAS was >3 then patient was given analgesic inj diclofenac sodium 75 mg IV. This was considered as time of request of first analgesic and

duration of TAP block. After that, total analgesic requirement in 24 hours was assessed.

STATISTICAL ANALYSIS:

Sample size was based on previous studies to maintain an alpha error of 0.05 and statistical power of at least 90%. All the quantitative data were measured as mean and standard deviation and their P values were compared using student's t-test. P value of <0.05 was considered as significant. SPSS version 20 was used for statistical analysis.

RESULTS:

Demographic data were comparable in both the groups. No significant difference was found in heart rate and MAP between the groups. Though heart rate of less than 60 and MAP of 90 was seen in 2 and 1 patient respectively in group BD but no treatment was required. Respiratory rate was also comparable in both the groups. Ramsey sedation score was noted post extubation, 1, 4, 8, 12, 18, and 24 hours. It was noticed that patients in group BD were more comfortable and calm with sedation score of 2-3 in comparison to patients in group BS. Time of request of first analgesic was noted from completion of the block and it was 517.93 ± 14.465 min in group BD and 296 ± 4.85 min in group BS. Total consumption of rescue analgesic in 24 hours was less in group BD as compared to group BS (1.067 ± 0.249 vs. 2.367 ± 0.481).

DISCUSSION

Postoperative pain and its associated implications pose a very distressing condition for the patient. There are a number of agents and modalities which can be used to alleviate pain like postoperative opioids, NSAIDs, epidural catheterization, peripheral nerve blocks etc. TAP block is a field block, which is used to relieve pain in lower abdominal surgeries postoperatively.^{3, 4, 5, 6} Dexmedetomidine an alpha₂ adrenergic agonist is used very commonly as perioperative adjuvant in regional as well as general anaesthesia.^{8, 9, 10, 11, 12} Dexmedetomidine, has 8 times more affinity for alpha₂ receptors as compared to clonidine which makes it much more stable hemodynamically and renders it more useful. In our study all the patients were demographically similar in two groups. (Table 1) There was no significant difference in hemodynamic parameters in both the groups. (Table 2) We have not studied the onset of block as it was difficult to assess and interpret it in immediate postoperative period.

Time of first request of analgesia was noted to be significantly higher in group BD which was 517.93 ± 14.465 min in group BD and 296 ± 4.85 min in group BS. (Table 3) Our findings are supported by Almarakbi et al.¹⁴ In their study they had given the TAP block prior to start of the surgery and found that, there is not only reduction of dose requirement of analgesic in postoperative period and prolongation of total duration of analgesia but also lead to decreased requirement of inhalational agents and narcotics intraoperatively in dexmedetomidine group.

We also observed a significant reduction in analgesic consumption in first 24 hours postoperatively in group BD compared to group BS. (Table 3) Almarakbi et al also noticed significant reduction of dose of opioid analgesics in PACU and complications related to opioid use like nausea, vomiting.¹⁴

VAS score was assessed till the request of first dose of analgesic. We observed that in Group BD, VAS score is significantly lower than in Group BS. In a study conducted by W.A. Almarakbi et al.¹⁴ have also found similar results with VAS scoring in dexmedetomidine group. Patients were more stable and calm due to comfortable sleep in dexmedetomidine group than in bupivacaine alone group. We attribute this to the unique property of dexmedetomidine of inducing conscious sedation.

CONCLUSION: In our study, TAP block with local anesthetics was found to be an effective method of reducing postoperative pain in total abdominal hysterectomies. When supplemented with

dexmedetomidine duration of analgesia was significantly prolonged. Reduction in analgesic requirement postoperatively was also observed.

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