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## ORIGINAL ARTICLE

# Saddle Block Anaesthesia with Meperidine for Perineal Surgery

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### ABSTRACT

**Background and Aim:** Regional (saddle block) anaesthesia in anorectal and some urological and gynaecological procedures provides suitable conditions for the surgeon due to the sufficiency of analgesia and decreases the side effects of spinal anaesthesia. In this study, duration of the painless period and complications after saddle block with Meperidine (pethidine) were assessed in perineal surgeries.

**Materials and Methods:** This study was conducted on 50 cases observed by the American Society of Anaesthesiologists (ASA) physical status class I, II (21-70 years old patients), who were scheduled to undergo anorectal surgery. All patients received 500ml of crystalloid solution. The saddle block was done with 30 mg pethidine and sub arachnoid puncture was performed with the patient in the sitting position. Vital signs were recorded 5 minutes before the block and at the 5<sup>th</sup>, 10<sup>th</sup>, 15<sup>th</sup> and 60<sup>th</sup> minutes after the block. The severity of postoperative pain was assessed by a visual analog scale. The data was analyzed by appropriate descriptive statistical methods.

**Results:** The mean period of analgesia was more than 24 hours in 18% of the patients. The VAS pain score showed no pain in 78% of the patients. Sixteen percent of the patients complained of itching in the nose, face and chest, ten minutes after injection and it continued for about two hours.

**Conclusions:** This study showed that the haemodynamic stability and quality of postoperative analgesia with pethidine was good, without any need for additional analgesia. We suggested using low dosage pethidine (30 mg) as saddle block for perineal and anorectal surgeries.

**Keywords:** Pethidine, saddle block, anaesthesia, side effects

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In an ideal spinal anaesthesia, there must be the best conditions, both for the surgeon and the surgery, such as relaxation of the surgery location, shortness of the patient's motionless state and an appropriate minimum period for recovery. In addition, the patient's analgesia must remain in adequate levels and he/she has to be in a good mood after surgery. The economical considerations, both for the patient and the hospital and absence of

### Introduction

any risks during and after the surgery, are also important.

Administration of analgesic medication before the actual onset of the pain stimulus is more effective than administration after the onset of the pain stimulus. This is the principle of preemptive analgesia. Although it is often considered superior to other forms of analgesia, its role in postoperative pain relief after lumbosacral spinal surgery has not been fully investigated [1]. Anesthesiologists have used many drug agents, especially lidocaine, in the usual procedures for anaesthesia. Regarding the efficacy of spinal anaesthesia in patients, tolerance in surgeries of the inguinal area and lower limbs, especially in patients with high risk (in conditions such as old age, obesity and cardiopulmonary diseases), in whom the extent of damage caused by general anaesthesia is high, the usage of spinal anaesthesia is effective. According to Miller and Ronald (2005), the length of analgesia by using usual drugs only lasts up to patient's anaesthesia block (54-60 min. for lidocaine, 60-90 min. for tetracaine and 90 min. for bupivacaine) [2]. The challenge of finding an ideal method to increase the length of analgesia without any complications or bad effects on motionless duration, inspired the researchers to study opioid drugs. Considering this important challenge, we studied pethidine and its effects on the length of analgesia in patients who underwent anorectal and perineal surgeries.

Pethidine is the only member of the opioid family that has clinically important local anaesthetic activity in the dose range which is normally used for analgesia. Pethidine is unique as the only opioid in current use, which is effective as the sole agent for spinal anaesthesia. In lower doses, intrathecal pethidine is also an effective analgesic for treating pain during labour [3].

Meperidine, which is known to have local anaesthetic properties, has been used successfully for spinal anaesthesia, though with a number of complications [4],[5]. The extent and duration of sensory and motor blockade obtained from the intrathecal injection of meperidine in a dose of 1 mg/kg body weight were adequate for surgery on the lower abdomen, perineum, and lower limbs and postoperative analgesia was prolonged [17].

Intrathecal meperidine has been used by several investigators for a variety of surgical procedures. They all found it to be effective, with only minor treatable side effects such as hypotension, pruritus, urinary retention, nausea and vomiting [7].

Intrathecal meperidine has been shown to have fewer side effects and prolonged postoperative analgesia [8],[9],[10]. However, there are relatively few studies which have examined the haemodynamic effects of intrathecal meperidine [11].

The objectives of the present study were to determine the duration of the painless period and complications after saddle block with Meperidine (pethidine).

## Materials and Methods

Fifty patients observed by the American Society of Anaesthesiologists physical status classification (ASA) I-II [12], who were scheduled for anorectal surgery, were enrolled in the study after obtaining the approval of the Local Hospital Ethics Committee and informed consent from the patients.

This study was objective- oriented and simple sampling was performed on 50 patients in the age range of 21-70 years by the American Society of Anaesthesiologists (ASA) as class I and II candidates for perineal surgery.

They had no cardiopulmonary disease and had consented to receive spinal

anaesthesia. All the patients were fasting about 8 hours before the operation.

We reviewed the medical files of the patients and tracked their medical history. The appropriate clinical examinations were done and the spinal column was assessed and they were examined before entrance to operating room. After that patients transported to post operating room, they were monitored by pulse-oximetry and ECG and their vital signs were registered every 30 minutes.

We recorded demographic data like sex and age of the patients and kept them under observation during the operation and up to 48 h. after the operation.

We didn't use any drugs as pre medication in our patients in this study, but the patients received 500 ML of crystalloid solution like ringer before anaesthesia. The spinal anaesthesia agent was injected into the L3-L4 or L4- L5 intra spinal space, with the patient in the sitting position, by a 24 gauge spinal needle. 30 mg of 5% Meperidine (pethidine) was injected to the sub-arachnoid space. The patients stayed in the sitting position for about 5 min for stabilization of the drug effect. After controlling blood pressure and cardiac monitoring with the patients in the supine position, we turned the patients to the lithotomy position.

Then, the sense of pain (by pinching, pricking pins, touching, touching alcoholic cotton on skin, etc) was checked for evaluation of the anaesthesia and dorsiflexion of feet for evaluation of motionless.

We used Visual Analogue Score (VAS) of Facial Expression for determination of the degree of pain (0: no pain, 1-3: mild pain, 4-7: moderate pain, >7: high pain).

The quality of the sphincter tone with digital rectal exam was determined by the surgeon and was classified into 3 categories as good (normal), intermediate and bad (lax).

We entered our data by SPSS-15 into the computer and used appropriate statistical methods for data analysis.

## Results

The mean age of the patients that were entered to our study was  $38.6 \pm 12.08$  SD and the median age was 35 years. The duration of analgesia in 78% (39) patients was more than 10 hours without additional analgesia. This length in 18% (9) patients was more than 48 hours and in 22% (11) patients, it was less than 10 hours. Sensory blockade was achieved in  $5.28 \pm 1.43$  min.

We classified the effect of the pain releaser methods with injection of meperidine anaesthesia in quada equine plexus as follows; 78% of our patients were painless and 4% and 18% described their pain degree as mild and moderate, respectively. None of them reported high or intolerable pain and most of the pain was located on the incision.

No patients had homodynamic changes and the vital signs were in normal ranges. Therefore, we evaluated this simple calmative method as a good procedure.

The patients were monitored for respiratory depression during and 24 hours after surgery. There weren't any significant findings. 16 % ( 8 patients) of the patients had mild itching. The common sites of excoriation due to their scratching were the face, the neck and the chest, and it started 10 min after injection with meperidine (pethidine).

The itching lasted till 2 hours after the end of the surgery. It did not produce any damage and therefore, wasn't

treated. 51.78% of men were disabled from urinating during 12 hours after surgery with one needed catheterization. Urinary retention wasn't observed in women and they urinated 6 hours after surgery.

The quality of anal sphincter tone was good in 82% of the patients.

No patients had any complications of spinal canal block such as headache, backache and so on. They also did not have arrhythmia, vomiting and nausea.

### Discussion

Intrathecal opioids are well established as agents in the management of postoperative pain [13]. However, in recent years, interest has been directed towards using the opioid, meperidine as an intrathecal anaesthetic agent. Meperidine differs from the other opioids in that it also possesses considerable local anaesthetic properties [14],[15].

The most common adverse effect of saddle block anaesthesia with meperidine is a syndrome which includes hypotension, bradycardia and hypoxaemia, appearing 20 to 30 minutes after injection; reversal is easily obtained by administration of pressure drugs and artificial ventilation [16]. Results of a research showed that postoperative neurological complications were recorded in three patients (2.7%): headache alone in one, headache associated with backache in one and leg weakness, backache, nuchal rigidity and photophobia in another. Seven patients (6.3%) complained of itching, five patients (4.5%) of nausea and vomiting and two (1.8%) developed urinary retention [17].

In a study, prolonged postoperative analgesia was obtained and some patients did not require additional narcotic analgesics during the postoperative period, which lasted upto

seven days. Side effects included nausea and vomiting (six patients), hypotension (five patients), pruritus (five patients) and urinary retention (two patients). There was no early or late respiratory depression [18].

The postoperative length of analgesia in our study was satisfactory. Researchers have shown that pain causes damage to respiratory functions and mobility and results in infection, delay in waking up and discharge. In our study, it was observed that most patients (78%) had analgesia time duration of more than 10 hours without any additional analgesia. The patients were confined to bed no longer than the expected time period. This decreased complications such as thromboembolism and infection.

The results of a comparative study of intrathecal pethidine versus lignocaine as an anaesthetic for perianal surgery showed that the sensory and motor blockade lasted longer with pethidine and only 10% of patients in the pethidine group required intramuscular analgesic supplementation, whereas 30% of patients in the lignocaine group required intramuscular analgesic supplementation [19].

In a study in Canada, it was shown that intrathecal meperidine administration can provide surgical anaesthesia and postoperative analgesia for about two to six hours; two cases of respiratory depression were reported in association with spinal anaesthesia by meperidine. They recommended that a patient's respiratory variables and oxygenation be closely monitored for at least one hour after intrathecal meperidine administration [20].

Some researchers believe that saddle block, a regional anaesthetic technique, may attenuate stress response in patients undergoing anorectal surgery by blocking afferent neural input during the early postoperative period [21].

The combined spinal-epidural (CSE) technique using bupivacaine - fentanyl has become an established method of pain control during parturition. One limitation is the relatively short duration of effective analgesia produced by bupivacaine-fentanyl. In contrast, subarachnoid meperidine has been shown to provide a long duration of anaesthesia in nonobstetric patients. Therefore, some researchers tested the hypothesis that subarachnoid meperidine produces a significant increase in the duration of analgesia as compared to bupivacaine-fentanyl. In a study in USA, 90 patients who were randomized were entered to a study, but it was discontinued because of a significant increase in nausea or vomiting in the patients. Nausea or vomiting was substantially increased in the meperidine groups as compared to the bupivacaine-fentanyl group. The mean duration of analgesia provided by 25 mg meperidine was  $126 \pm 51$  min as compared to  $98 \pm 29$  min for bupivacaine-fentanyl and  $90 \pm 67$  min for 15 mg meperidine, but this difference were not significant ( $P = 0.27$ ) from the statistical point of view. Although intrathecal meperidine could potentially prolong subarachnoid analgesia during labour, its use was associated with a significant incidence of nausea or vomiting. These data do not support the use of subarachnoid meperidine in doses of 15 or 25 mg for labour analgesia [22].

Results of a study comparing pethidine and lidocaine- glucose as spinal anaesthetics showed that complications in both groups included decrease in blood pressure and nausea and vomiting intraoperatively and urinary retention, nausea, vomiting, and mild headache postoperatively, which were the same. But some complications occurred only in the meperidine group, like intra-operative drowsiness, respiratory depression, bronchospasm and itching. The frequency of complications was greater with

meperidine [6]. A study comparing intrathecal pethidine and intrathecal bupivacaine as sole anaesthetics determined that there was no significant difference in the incidence of hypotension and that pethidine induced a significant greater reduction in heart rate, lower degree of motor block, shorter period before requesting postoperative analgesia, although a higher incidence of sedation, nausea and vomiting was recorded [23]. We did not observe the signs of respiratory depression and drowsiness which were mentioned as the main complications caused by opioids by Thomas et al (2000) and Martindale (2002) [24],[25]. Using intra-theal pethidine hydrochloride for urological surgery showed that the pethidine regimen provided acceptable intra-operative quality anaesthesia, low incidence of adverse events and longer duration of pain-free period after the surgery [26], these results were agreeable with our findings.

Mircea et al (1982) used 50-100 mg of pethidine intrathecally in patients who were prepared for surgery. They observed that this procedure provided sensory-motor blockage, with minimum complications in 90% of the patients. There was satisfactory analgesia length without neurological damage and delayed respiratory depression after surgery [27]. This report puts emphasis on our findings.

Yokoyama and Shimi (1991) studied on 22 patients. They injected 0.5 mg of meperidine into 12 patients and 0.7 mg into 10 patients intra-theally and then held them in a sitting position for about 5 minutes, as we did in our study. As in our study, there weren't haemodynamic changes and delayed respiratory depression and the sensory-motor blockage of the anal sphincter was satisfactory. In addition, they observed itching, nausea and arrhythmia in 2 patients [28].

The results indicated that the co-administration of pethidine (0.75 mg/kg) and clonidine (75 micrograms) intrathecally provided good intraoperative anaesthesia for total hip replacement and the sensory-motor block was short [29].

The effect of the addition of low dose meperidine to spinal lidocaine on the sensory and motor blockade profile and the quality and duration of postoperative analgesia is considerable. The addition of 0.3 mg/kg of meperidine to spinal lidocaine prolongs postoperative analgesia without delaying the discharge from the post anaesthetic care unit and reduces the requirement for parenteral analgesics [30]. In contrast, there is evidence that increasing the dose of meperidine from 1.2 to 1.5 mg/kg increased the duration, but not the level of the sensory block without an increase in the side effects [31].

Ehikhamatalor and Nelson (2001) studied on 90 patients in Eastern India. One group received bupivacaine and the other received pethidine. The success rates in the pethidine and bupivacaine groups were 59% and 52.2%, respectively. Postoperative analgesic effects were prevalent for a longer time in the pethidine group, with recoverable moderate complications and without additional calmatative usage [32]. These findings corresponded to ours.

Chen et al suggested that a small dose of intrathecal meperidine might decrease the incidence of shivering and the discomfort associated with it in a nonobstetrical population [33],[34]. In comparison with our results, the results derived from another study about meperidine dose in subarachnoid anaesthesia demonstrated that 1 mg/kg of pethidine administered by the subdural route provided a complete spinal anaesthesia including motor, sensory and sympathetic blockade,

allowing surgical procedures in good conditions of security, but this technique is only indicated for surgery in the perineum and lower limbs [16].

## Conclusion

From our findings and previous similar studies, we could conclude that pethidine injection for regional (saddle block) anaesthesia provides haemodynamic stability, considerable postoperative length of analgesia and minimum complications. So we suggested the usage of low dosage pethidine (30 mg) with a 24-gauge spinal needle in the sub arachnoid space of quada equine as the saddle block for perinea and anorectal surgeries.

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