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# INTRATHECAL PETHIDINE AS A SOLE ANAESTHETIC AGENT FOR PERINEAL SURGERIES

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ABSTRACT

**Aims** This study is aimed at evaluating the effectiveness of 5% pethidine hydrochloride solution as spinal anaesthesic for perineal surgeries.

**Materials and methods** A total of 50 patients in the age group of 20-60 years and weighing between 30-70 kg and , belonged to ASA physical status I were selected for this study. After obtaining consent , subarachnoid block was performed using intrathecal 5% pethidine hydrochloride 0.7mg/kg(without adrenaline) and test parameters were noted.

**Results** The onset of sensory blockade was 2-4 minute with mean 2.55+0.56 minutes. The maximum dermatome level of sensory block obtained with intrathecal pethidine was T8 and mean level of sensory blockade was T12. The mean duration of sensory blockade lasted for 181.90±15.10 minutes. The motor blockade was achieved 2-3 minutes after the sensory block. The time of onset of motor block after injection set in 4-7 minutes ,with mean 5.8±0.54 minutes. The range of analgesia in the post operative period was from 420 minutes to 670 minutes with mean 596.60±43.54 minutes. The incidence of side effects were low.

**Conclusion :** Intrathecal pethidine in a dose of 0.7 mg/kg body weight is provided to be safe and effective as a sole anaethetic agent for perineal surgeries it produce prolonged analgesia

## INTRODUCTION:

Spinal analgesia is simple, quick to perform and clear in end point of successful needle positioning; the analgesia is rapid in onset and the spread of analgesia can be controlled, it requires a small dose of local analgesic, yet producing a profound degree of blockade.

## AIM OF THE STUDY:

This study is aimed at evaluating the effectiveness of 5% preservative free pethidine hydrochloride solution as spinal anaesthesic for perineal surgeries.

## Materials and methods:

A total of 50 patients including 38 males in the age group of 20-60 years , weighing 35-70 kg and 12 females in the age group of 20-50 yrs. weighing 40-61 kg were randomly selected for this study, belonged to ASA physical status I. The patients were informed about the procedure and the drug to be used informed consent for the surgery and the study were obtained.

**Table 1:Indications:**
**Surgical Statitistics**

| S.No | Indication | No.of patients |
|---|---|---|
| 1 | Haemorrhoids | 35 |
| 2 | Fissure in ano | 11 |
| 3 | Fissure in ano | 4 |
| | Total | 50 |

## Material used:

Intravenous 18 G cannula
Insulin syringe
23 G lumbar puncture needle
5% pethidine hydrochloride(preservative free)
Sponge holding forceps
Sterile gauze and towel
Sphygmomanometer
E.C.G monitor
Pulse oximeter.

## METHODOLOGY:

All the patient selected for the study were subjected to routine, pre operative investigation. An intravenous line was first secured with an intravenous cannula. The pulse rate,blood pressure and respiratory rate were recorded. The patient's E.C.G was continuously monitored. The operative table was kept at a horizontal level parallel to the floor without any tilt. With the patient in sitting position , a lumbar puncture was performed at L3-L4 space with 23G quincke needle. After obtaining a free flow of C.S.F, a dose of 5% pethidine hydrochloride 0.7mg/kg (without adrenaline)was injected intrathecally and the patient was kept in sitting position for 5 minutes. If the calculated dose was below 30 mg, a fixed dose of 30 mg was given. The administration of drug was through insulin syringe .The patient was placed supine and the speed of onset and the level of sensory blockade were assessed. Analgesia was tested by pinprick time of commencement, onset of non analgesia and level of analgesia were noted.

The patients were similarly asked to lift their legs in order to establish their onset of weakness, heaviness or difficulty in lifting the legs was taken as an indication of motor block .The degree of anal sphincter relaxation as felt by surgeon was also taken as an indication of motor blockade.

The duration of analgesia was taken as the interval between the time of subarachnoid injection to the time when pain become severe enough to require additional parenteral and oral analgesia. Intraoperatively the patients E.C.G was continuously monitored. The PR,BP,RR were tested in the intraoperative and postoperative period .

A 30 mmHg decrease from base level was taken as hypotension and a pulse rate of less than 60 per minutes as bradycardia. A respiratory rate of less than 8 per minute was considered to be indicative of respiratory depression.

During intraoperative and postoperative period attention was paid to side effects like nausea, vomitting, pruritis, respiratory depression and other effects of spinal anaesthesia. Before discharging from the hospital, a clinical examination was performed on the patient to exclude any neurological deficit.

## Observations:

The following parameters were studied:

**Onset of sensory block:** Time when the patient does not feel pinprick sensation.

**Onset of motor block:** Time when the patient has difficulty in moving his lower limb.

**Highest level of sensory block:** The highest level achieved within 20 minutes at which there was loss of pinprick sensation.

**Duration of sensory block:** Time interval between the onset of sensory block and the time at which the patient started feeling the pinprick sensation at blocked segments.

**Duration of motor block:** Time interval between the onset of motor block and the time at which the patient is able to move his lower limb without difficulty against gravity and resistance.

**Duration of analgesia:** The duration between the time of subarachnoid injection of pethidine to the time the patient demanded supplemental analgesic.

**RESULTS:**

The subarachnoid injection of pethidine resulted in analgesia similar to that noted with intrathecal administration of local analgesics .The onset and duration of sensory and motor block and duration of analgesia along with associated side effects were studied in 50 patients receiving intrathecal 5% pethidine hydrochloride(0.7mg/kg)as the sole anaesthetic agent for perineal surgeries.

**Table 2:AGE AND SEX DISTRIBUTION:**

| S.NO | Age group | 5%pethidine hydrochloride Male | Female |
|---|---|---|---|
| 1 | 20-30 | 11 | 5 |
| 2 | 31-40 | 10 | 5 |
| 3 | 41-50 | 9 | 2 |
| 4 | 51-60 | 8 | Nil |

A total of 50 patients including 38 males in the age group of 20-60 years (mean age of 39.66+12.18 years), weighing 35-70 kg.(mean weight of 53.03+10.14 kg) and 12 females in the age group of 20-50 years (mean age of 32.92+9.62 years), weighing 40-61 kg.(mean weight of 51.42+7.70 kg) were randomly selected for this study. All patient selected for this study belonged to ASA physical status 1.

**Table 3: NATURE AND NUMBER OF SURGERIES:**

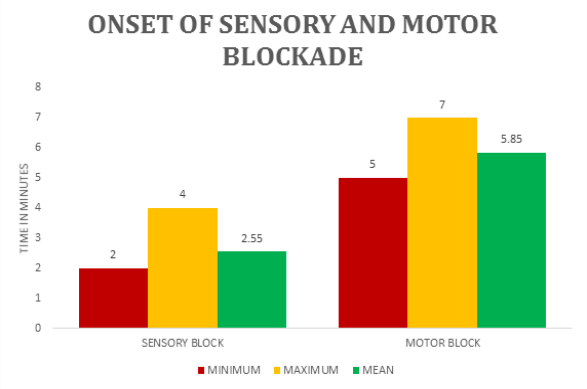
| **S.NO** | **Surgery** | **Male** | **Female** |
|---|---|---|---|
| **1** | Haemorroidectomy | 29 | 6 |
| **2** | Fistulectomy | 3 | 1 |
| **3** | Fissurectomy | 6 | 5 |

Among 50 patients, 29 male and 6 female underwent haemorroidectomy,3 male and 1 female underwent fistulectomy and 6 male and 5 female patients underwent fissurectomy.

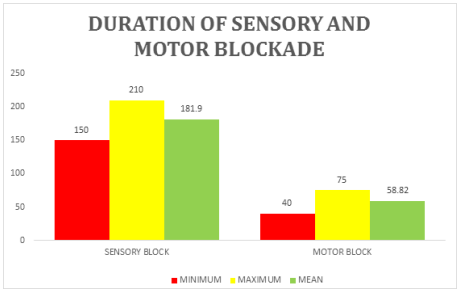
**Table 4: ONSET AND DURATION OF ANALGESIA**
**Sensory and motor block:**

| S.NO | Clinical parameter | Time/duration in min |
|---|---|---|
| 1 | Onset of senory block | 2.55±0.56 |
| 2 | Onset of motor block | 5.85±0.54 |
| 3 | Duration of sensory block | 181.90±15.10 |
| 4 | Duration of motor block | 58.82±7.47 |
| 5 | Duration of analgesia | 596.60±43.54 |

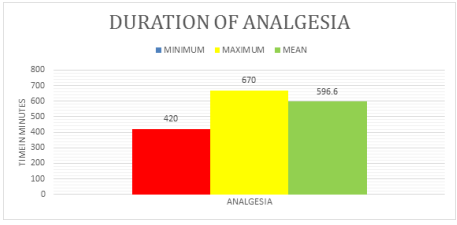
**GRAPH : 1 ONSET OF SENSORY AND MOTOR BLOCKADE**




**GRAPH : 2 DURATION OF SENSORY AND MOTOR BLOCKADE**




**GRAPH :3 DURATION OF ANALGESIA**




The sensory blockade required was corresponding to the innervation from S2-S5 sacrococcygeal area ,perineum, buttock and posterior surface of the thigh.The onset of sensory blockade was 2-4 minute with mean 2.55+0.56 minutes. The maximum dermatome level of sensory block obtained with intrathecal pethidine was T8 and mean level of sensory blockade was T12. The mean duration of sensory blockade lasted for 181.90±15.10 minutes. The time of onset of motor block after injection set in 4-7 minutes ,with mean 5.8±0.54 minutes. The mean duration of motor block lasted for 58.82±7.47 minutes. The range of analgesia in the post operative period was from 420 minutes to 670 minutes with mean 596.60±43.54 minutes.

**Table 5: INCIDENCE AND SIDE EFFECTS:**

| S.NO | Side effect | Intraoperative | Postoperative |
|---|---|---|---|
| 1 | Nausea | 2 | Nil |
| 2 | Vomiting | 4 | Nil |
| 3 | Hypotension | 1 | Nil |
| 4 | Respiratory depression | Nil | Nil |
| 5 | Bradycardia | 1 | Nil |
| 6 | Pruritis | Nil | 4 |
| 7 | Urinary retention | Nil | 3 |

**Side effects:**

The incidence of side effects due to subarachnoid block with 5% pethidine were low and they were immediately corrected with appropriate drugs or cleared spontaneously.

**DISCUSSION:**

The intrathecal injection of 5%pethidine hydrochloride in the dose of 0.7 mg/kg. body weight provided effective block with satisfactory analgesia and adequate relaxation for minor perineal surgeries like haemorroidectomy, fistulectomy, fissurectomy. Unlike saddle block with lignocaine ,the subarachnoid injection of pethidine provided advantageous and significant postoperative analgesia for longer periods (596.60±43.54 minutes). The exact mechanism by which intrathecal pethidine provides motor blockade as well as prolonged analgesia is not completely understood. Pethidine,one of the phenyl piperidine derivative of the opioid is known to possess local analgesic activity and also it is closer in physicochemical properties to lignocaine .

MIRECA N ET AL (1982), FAMEWS AND NAQUIB (1985) showed that pethidine unlike other narcotics when administered intrathecally exhibited all the effect of subarachnoid injection of local anaesthetics and analgesia obtained was adequate for surgical intervention. Present study also correlated with the above study in a dose of 0.7 mg/kg body weight.

FAMEWS AND NAQUIB observed prolonged post operative analgesia in some patient,who did not require any analgesics in the

post operative period,lasting upto 7 days after the use of 1 mg/kg body weight of intrathecal pethidine and was observed upto 596.60±43.54 minutes.

In present study,5% pethidine hydrochloride 0.7 mg/kg body weight was given intrathecally, sensory blockade was achieved in 2-4 mins. Motor blockade achieved 2-3 min after the sensory blockade. Sensory blockade lasted for 181.90+15.10 minutes followed by post operative analgesia, the mean duration of which was 596.60+43.54 minutes. During surgery, the patients were stable and no respiratory depression were noted. Four patients complained of itching, six patients of nauesa ,three patients developed urinary retention. It is significant to note that there was no incidence of early respiratory depression in any patient in our study. Pethidine unlike morphine is highly lipophilic. This allows a rapid onset of action and minimal residual CSF concentration of drug available for rostral spread to brain. This explains the absence of respiratory depression in the study.

BROMAGE PR ET AL(1982) suggested that pruritius may be due to alteration in sensory modulation following opioid spread over the spinal cord to brain. They also found naloxone to be effective in the control of pruritis in some cases.

REIZ AND WESTBERG (1980) reported adverse reaction such as pruritis and urinary retention after intrathecal administration of opioid . In our study four patient who had pruritis had itching all over the body including the face which was partially relieved by antihistaminics. It has been suggested that facial pruritis could be due to the rapid penetration of the opioid to the spinal tract of $5^{th}$ nerve.. It has been suggested that pruritis may be due to alteration in the sensory modulation following opioid spread over spinal cord to brain. Pruritis appear to be dose related. Three of the patient in our study had urinary retention. The mechanism of urinary retention following spinal opioid is not completely clear. Its antagonism by naloxone in some cases suggested that involvement of opiate receptor probably through inhibition of acetylcholine release from efferent post ganglionic innervation of detrusor muscle.

In our study only two patients developed nausea and 4 patients developed vomiting. It has been suggested that this could be due to rostral spread of opioid to the vomiting centre and to the chemoreceptor trigger zone.

TAUZIN –FIN P , GOZAT O ET AL (1987) studied the clinical implications of pharmacokinetics of intrathecal pethidine in a dose of 1mg/kg.body weight in 11 male patients undergoing endoscopic resection of prostatic adenoma and bladder tumour and concluded that intrathecal pethidine was an effective agent for spinal anaethesia and the prolonged postoperative analgesia was due to drug acting on opioid receptors in spinal cord. This led to the necessity of postoperative monitoring during 24 hours after intrathecal pethidine administration.

SHIMAI AND YOKOYAMA K (1991) studied twenty two patients of ASA physical status I and II undergoing surgery on the perineal region giving intrathecal pethdine as a sole agent. Anaesthetic effect of 0.5mg/kg body weight (group-I) or 0.7mg/kg body weight (group – II) of pethidine was evaluated and compared. The results concurred with the data obtained in our study.

## CONCLUSION

Pethidine provided safe and sure saddle block. Haemodynamic stability and limited segmental blockade enable early ambulation. In conclusion intrathecal pethidine in a dose of 0.7mg/kg body weight is provided to be safe and effective as a sole anaethetic agent for perineal surgeries.

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