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INTRATHECAL LOW-DOSE LEVOBUPIVACAINE WITH FENTANYL FOR SHORT UROLOGICAL PROCEDURES. A PROSPECTIVE CLINICAL STUDY

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ABSTRACT

INTRODUCTION: Spinal anaesthesia has been most widely practised anaesthesia technique worldwide due to its well-known advantages. Short urological procedures are often done on day care basis and short duration spinal anaesthesia is preferred technique if possible. Material and Methods: Present study assesses block characterstics of intrathecal low dose levobupivacaine (5mg) with fentanyl (20mcg) for short duration urological procedure. Results: The onset and duration of sensory block was found to be 9.21 ± 2.37 and 113.62 ± 7.9 min respectively. Onset and duration of motor block was 11.23 ± 3.43 and 92.76 ± 8.67 min respectively.

CONCLUSION: Low dose levobupivacaine with fentanyl can be useful alternative for short procedures aiding in accelerated functional recovery of the patients with minimal side effects.

INTRODUCTION:

Spinal anesthesia has been the most commonly used anesthesia procedure worldwide. Several advantages and recent studies have contributed to widespread use of spinal anesthesia with more precise control over block characteristics[1]. With increased availability of newer safer drugs such as levobupivacaine (pure S-enantiomer of bupivacaine) and intrathecal adjuvants, more procedures are being done under spinal anesthesia. Intrathecal administration of a combination of opioids and local anaesthetics produces a synergistic effect without prolonged motor nerve block and aids in faster patient turnover and hospital discharge[2,3].Objective of this clinical study was to assess the block characterstics and effectiveness of low dose spinal levobupivacaine (5 mg) in combination with 20µg fentanyl for short urological procedures.

MATERIAL AND METHODS:

After obtaining written informed consent from the patients, this prospective clinical study was done in 50 patients undergoing short urological procedures such as bladder neck dissection, diagnostic cystoscopy, urethrotomy etc. The study was carried out at IGIMS, Patna and 50 patients of ASA grade 1 & 2, both sexes, age 40-70years, weight 50-70kgs, height 150-180 cms were studied for the block characterstics. Any patients with pre-existing systemic disease such as cardiac, renal, hepatic, bleeding abnormalities were excluded from the study design. Patients who refused for spinal anesthesia and skin infections were also excluded from the study. Drug preparation: 1 ampoule of fentanyl (100mcg = 2ml) was diluted to 5ml (making 20mcg=1ml). 1 ml of this drug (20mcg) was taken and mixed with 1 ml of 0.5% levobupivacaine for spinal anesthesia.

Detailed pre-anaesthetic check up was done 1 day prior and NPO status was maintained for 6 hours. Upon arrival to operation theatre, standard monitors were attached which included ECG, Pulse oximetry & NIBP. Intravenous line was secured with18g cannula and patients were preloaded with 10ml/kg ringer lactate. Under strict aseptic precautions and after local skin infiltration, Lumbar puncture was performed in sitting position, by midline approach, using 25G disposable Quincke's spinal needle at L3-L4 intervertebral space. Free and clear flow of CSF was confirmed and with the direction of bevel of spinal needle facing cephaloid, study drug was slowly instilled intrathecally (0.2ml/sec). Patients were made supine immediately and time of drug administration was noted as 0 minutes. Oxygen supplementation with face mask (5lit/min) was given The study was aimed to assess onset of sensory and motor block, duration of sensory and motor block, timing of rescue analgesia, any changes in hemodynamic parameters and study any adverse events. The time of onset of sensory block was taken from the time of injection of drug intrathecally to loss of pin-prick sensation using sterile hypodermic needle at T10 dermatomal level every 30 seconds after positioning and time interval was noted. The duration of sensory block was taken as time from onset to time of return of pin-prick sensation using hypodermic needle to S1 (heel) dermatomal area. It was tested at every 10min interval post-operatively and the time was noted as duration of sensory block. The time interval between drug instillation and the patient's inability to move hip, knee or ankle (modified bromage scale grade 3) was taken as onset time. Patients were asked to move lower limb at 30 seconds interval and time interval was recorded. The duration of motor block was taken from time of injection to complete regression of motor block i.e. ability to move hip, knee & ankle. Patients were asked to move limbs at 10min interval postoperatively and the time interval was recorded as duration of motor block.

Analgesics were avoided until demanded by the patient. The time interval for the first analgesic consumption was noted as time for rescue analgesia. Pain assessment was done by visual analogue score (0-10).

Vital parameters like Heart rate, blood pressure, SPO2 and respiratory rate were recorded intraoperatively and postoperatively till recovery of sensory block. Any intra-operative adverse events like nausea, vomiting, pruritis, sedation, respiratory depression or any post-operative events such as urinary retention, sedation etc. also recorded. Any event of bradycardia (heart rate less than 60 beats/ min) or hypotension (systolic blood pressure less than 90mm of hg or more than 30% decline from baseline values) were noted and accordingly treated with atropine or mephenteramine boluses. Statistical analysis was done using INSTAT for windows statistical Analysis Software. The values were represented as Mean ± SD.

RESULT:

The demographic profile has been tabulated in table-1. The onset and duration of sensory block was found to be 9.21 ± 2.37 and 113.62 ± 7.9 min respectively. Onset and duration of motor block was 11.23 ± 3.43 and92.76 ± 8.67 min. Timing of rescue analgesia as assessed by VAS score was 126.54 ± 12.67 min. Vital parameters were maintained within normal range and none of the patients required atropine or mephenteramine dose. However, 5 patients experienced mild pruritis which was self-limiting not requiring any treatment.

Age (years)	56.81 ± 7.42 years
Sex ratio (male/ female)	39/11
Height	162.71 ± 6.8 cms
Weight	60.71 ± 6.42 kgs
ASA Grade 1 / 2	41 / 9
Mean duration of surgery	32.31 ± 4.31 minutes

Table 1: Demographic profile

Onset of sensory block	9.21 ± 2.37 min
Duration of sensory block	113.62 ± 7.9 min
Onset of motor block	11.23 ± 3.43 min
Duration of motor block	92.76 ± 8.67 min
Timing of rescue analgesia	126.54 ± 12.67 min

Table 2: Block characteristics

DISCUSSION:

The present study indicates that spinal anaesthesia with low dose levobupivacaine and 20mcg of fentanyl provides good quality anesthesia for short urological procedures. Moreover, this low dose intrathecally is well suited for outpatient setting as it facilitates rapid full recovery of motor and sensory function with possibly early ambulation which is suited in short procedures.

Anesthesia technique for short urological procedures depends upon various factors including duration of surgery, patients as well as surgeon's preference, pain control and early ambulation. Several studies have been done in need of lowest possible drug doses intrathecally so as to have balance between adequacy of anesthesia and earliest ambulation with minimal side effects. Increasing the dose of local anaesthetics intrathecally increases the side effects such delayed ambulation, voiding problems, haemodynamic disturbances and delayed discharge which has an added burden over the hospital.

Casati et al[4] compared low dose bupivacaine (8mg), levobupivacaine (8mg) and ropvacaine (12mg) for inguinal hernia repair and found that motor recovery was faster with levobupivacaine and ropivacaine with time to home readiness similar in all groups. There were no incidence of urinary retention but time to urine voiding was increased. In an another study by Gupta A et al using low dose bupivacaine (6-7.5mg) with fentanyl, the overall need for urinary catheterisation was 18%.Breebaart et al.[5]evaluated bladder function with urinary bladder scanning after spinal anaesthesia with 10 mg levobupivacaine, 15 mg ropivacaine, or 60 mg lidocaine and reported that the incidence and degree of micturition problems were not different with the three drugs. In the study by Girgin NK et al[6], low dose levobupivacaine (5mg) with 25mcg fentanyl intrathecally is well suited for inguinal hernia repair under spinal anaesthesia with faster patient ambulation time and minimal side effects.

In the present study, incidence of urinary retention could not be assessed as all patients were routinely catheterised after operative procedures. However various studies have reported significantly shorter time to urination with low dose of intrathecal levobupivacaine. In a study by Casati et al, time to hospital discharge were significantly shorter with low dose levobupivacaine which indicates towards early ambulation. In our study, we could not comment over time to hospital discharge but time to ambulation was significantly shorter with intrathecal levobupivacaine with faster regression of block.

Vitals were within normal range with baseline values and there were no significant side effects except pruritis which were present in 5 patients and were self limiting not requiring any treatment.

CONCLUSION:

To conclude, addition of fentanyl 20mcg with low dose levobupivacaine (5mg) prolongs duration of sensory block without increasing any side effects except pruritis. Time to ambulation was also very less which has an advantageous value in short duration procedures aiding in accelerated functional recovery.

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