

26/03/2019

***Official title:***

**“A novel analgesic method for postoperative pain relief after cesarean section:  
Intraoperative superior hypogastric block”**

## **Study Protocol and Statistical Analysis Plan**

## **Study Protocol**

This prospective, randomized, double-blind, placebo controlled study was conducted at our tertiary obstetric referral clinic, Istanbul, Turkey, between January 2019 and March 2019, after the approval by the Institutional Review Board and the Local Ethics Committee (101/5.5.2017) Informed verbal and written consent was taken from all participants.

### *Patient selection*

Term singleton pregnant women between ages 18 to 40 with no previous history of cesarean section or abdominal surgery were scheduled for elective cesarean operation under general anaesthesia. Only ASA 1-2 patients were included to the study. We excluded patients with suspected or manifest bleeding disturbances, chronic pelvic pain, allergy to NSAID's or opioids, atopia, bronchial asthma, diabetes mellitus, the presence of liver or kidney diseases, abuse of drugs or alcohol, and patients with pregnancy-induced hypertension or preeclampsia. The patients underwent emergency cesarean section were also excluded from the study.

### *Randomization*

Patients were randomly allocated in two groups. The allocation sequence was generated by a random number table, and group allocation was concealed in sealed, opaque envelopes that were not opened until operation. During the operation the envelope was opened by a nurse outside the operating theatre. The nurse prepared a blind syringe with the study drug, which was then transferred to a sterile bowl in the operating room and injected. Both bupivacaine and saline are colourless and not possible to identify the solution by its visual appearance, or by smell. The envelope was then sealed again and not opened until the study was concluded. The patients, anesthesiologists, and nurses providing postoperative care were blinded to group assignment.

### *Anaesthesia*

The routine standardised general anesthesia and perioperative analgesia protocol were applied to all of the patients without premedication. Propofol 2,5mg/kg and rocuronium 0,6mg/kg were used respectively for induction of general anesthesia. Following adequate muscle relaxation endotracheal intubation was performed. The maintenance of the anesthesia was provided by sevoflurane 0.6 MAC in oxygen/air. The concentration of sevoflurane was adjusted according to the hemodynamic response. For perioperative analgesia, 15 mg/kg paracetamol (max 1 gr) and 20 mg tenoxicam performed to all patients intravenously approximately 30 minutes before surgery ended.

### *Surgery and the SHP block technique (SHB)*

Surgery was performed through a Pfannenstiel incision in all cases. After delivery of the baby and placenta, uterine incision was closed with exteriorization of the uterus, and blood accumulating into the pelvis was carefully cleaned. After hemostasis, the SHP block was performed after Injection of either bupivacaine or saline in the area of SHP. It is situated anterior to L5–S1 vertebral bodies, caudal to the bifurcation of the aorta. An injection of 20 ml of bupivacaine 2,5 mg/ml or saline 9 mg/ml was done retroperitoneally in the area.

At the postanesthesia care unit (PACU) the women were monitored for degree of sedation, haemodynamic and respiratory stability, pain and nausea according to routine schedules. When the patient was awake and vital signs stable she was discharged from PACU to the ward. Postoperative pain assessed by the 10 cm visual analogue scale (VAS) ranging from 0 to 10, where 0 indicates no pain and 10 indicates the worst pain imaginable. Patients were asked to rate their pain scores when lying still in bed (rest) and on attempting to sit forward in bed or on mobilization (movement). VAS scores were assessed and recorded by a pain nurse at 2, 6, 24 and 48 hours (VAS 2, VAS 6, VAS 24, and VAS 48) respectively after surgery. Diclofenac sodium as NSAID and Pethidine as opioid were the routinely used analgesics for pain management in the PACU and surgical ward in our hospital. Target VAS score for adequate pain management was  $<4$ . NSAID was applied to patients with VAS scores  $\geq 4$ . If there was no decrease in VAS scores or NSAID was inadequate, opioid analgesic was administered. The number of vials of analgesics (diclofenac sodium 75mg=1 vial; Pethidine 50mg=0,5 vial) administered to patients were recorded. Nausea and vomiting were considered to be present when at least 1 episode was noted during the 48 hours of the study. The time from surgery to the first passing of the gas was recorded as a sign of bowel movements and return of gastrointestinal function. The length of surgery was also noted in all cases.

The primary outcome of the study was pain scores on rest and on movement at 24 th hour after surgery. The secondary outcomes are; pain scores at 2, 6 and 48 hours after surgery on rest and on movement; opioid or NSAID requirement; return of gastrointestinal function, rate of nausea and vomiting as a side effect and length of surgery.

### **Statistical method**

Mean, median, minimum, maximum, standard deviation, ratio and frequency values were used in descriptive statistics of the data. Distribution of the variables was checked with Kolmogorov Simirnov test. The Mann–Whitney U test were used in the analysis of the quantitative data. The chi-square test was used in the analysis of the qualitative data. SPSS (Statistical Packages for Social Sciences) Windows software 22.0 was used in the analyses.