

Original Research Article

Comparison of USG guided modified rectus sheath block with intraperitoneal instillation with Inj. Bupivacaine for postoperative pain relief in diagnostic laparoscopy

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Abstract

Background: Laparoscopic surgery is associated with considerable postoperative pain, though it is less compared to open surgery. Post laparoscopic pain results from phrenic nerve irritation caused by residual gas, stretching of the intraabdominal cavity and peritoneal inflammation. The Modified Rectus Sheath Block (MRSB) is fairly easy and reliable procedure when performed using ultrasound guidance so it is compared with the intraperitoneal instillation method by using Inj. Bupivacaine for postoperative analgesia in diagnostic laparoscopy. Aim of the study was to assess and compare the effect of the USG guided modified rectus sheath block (MRSB) with the intraperitoneal instillation using Inj. Bupivacaine in diagnostic laparoscopy.

Material and methods: It was prospective randomized study. The Patients were randomly allocated in two groups. Group A were given USG guided rectus sheath block and Group B was given

intraperitoneal 25 mg Bupivacaine. Patients with obesity, local anesthetic agent allergy and emergency surgeries were excluded. Pain was assessed 1, 6, 10 and 24 hours postoperatively by visual analogue pain score.

Results: Postoperative pain was assessed by visual analogue pain score (VAS) at every hour for 24 hours postoperatively. The VAS was significantly lower in Group A at 6 and 10 hours postoperatively. After 6 hours the median pain score was 3 in group A while it was 7 in group B. After 8 hours the median pain score was 2 in group A compared with 5 in group B and after 10 hours the median score were 2 and 5 in group A, group B respectively ($p < .001$ and < 0.004 respectively). No significant difference noted in pain score at 1 hour and 24 hour post laparoscopy among the two groups.

Conclusion: USG guided modified rectus sheath block (MRSB) provides prolonged post operative analgesia than intraperitoneal instillation in diagnostic laparoscopy.

Key words

Rectus sheath block, Bupivacaine, VAS, Laparoscopy.

Introduction

Laparoscopic surgery is associated with considerable postoperative pain, though it is less compared to open surgery. The laparoscope is inserted with the aid of large-bore trocar, usually through a midline sub umbilical incision in order to penetrate the rectus sheath and peritoneum. Successful blockade of the relevant inter costal nerves within the rectus sheath produce full thickness anaesthesia of anterior abdominal wall and provide postoperative analgesia. Post laparoscopic pain results from phrenic nerve irritation caused by residual gas [1], stretching of the intraabdominal cavity [2] and peritoneal inflammation [3]. The Modified Rectus Sheath Block (MRSB) is fairly easy and reliable procedure when performed using ultrasound guidance so it is compared with the intraperitoneal instillation method by using Inj. Bupivacaine for postoperative analgesia in diagnostic laparoscopy. Aim of the study was to assess and compare the effect of the USG guided modified rectus sheath block (MRSB) with the intraperitoneal instillation using Inj. Bupivacaine for postoperative analgesia in diagnostic laparoscopy.

Material and methods

Total 60 adult patients of 18- 40 years of age and ASA grade I/II having 40-70 kg weight were included in this study. After informed written

consent routine pre-anesthetic check-up of all patients and necessary investigation were carried out. Patients with local abdominal wall infection, allergy to local anesthetic drug and obese patients were excluded from the study. Patients were kept nil by mouth (NBM) for 6 hours. All patients were given Tab. Alprazolam 0.5 mg at night before surgery. Patients of diagnostic laparoscopy under general anesthesia were randomly divided in two groups. Each group included 30 patients. After completion of surgery, Group A were given USG guided Modified Rectus Sheath Block (MRSB) with Inj. Bupivacaine 0.25% 10 ml on each side and Group B were given intraperitoneal instillation with Inj. Bupivacaine 0.25% 10 ml + 10 ml normal saline. Pain was assessed every hourly for 24 hours for postoperative analgesia by a visual analogue pain score (0 = no pain, 10 = severe pain). Pain was assessed by an independent observer blind to the patients grouping.

Modified Rectus Sheath Block (MRSB)

- Group A Patients were received MRSB under strict aseptic precautions.
- A linear Probe was placed transverse over Abdomen just below the umbilicus on either side of the midline.
- 23 G spinal needle attached by flexible tubing to a 0.25% Bupivacaine filled

syringe was introduced in midline 2 cm below the Umbilicus. Move probe laterally and scan Rectus abdominis muscle in transverse plane.

- Insert Block needle in plane, the puncture point should be suitably lateral that the needle had shallow trajectory.
- Aim was to position the tip of the needle between the rectus abdominis muscle and posterior rectus sheath. Needle tip was stopped just superficial to the first white line (posterior sheath) as 'pop' is not felt in all patients.
- 0.25-0.5 ml was aspirated and injected, if the tip was in correct plane the muscle was peeled off the posterior sheath. 10 ml of 0.25% bupivacain was deposited in the potential space between the rectus abdominis muscle and posterior aspect of the sheath.
- Patient were watched and observed for specific complication like,
 - Peritoneal puncture
 - Perforation of bowel
 - Visceral puncture
 - Inferior Epigastric vessels puncture
 - Retroperitoneal hematoma

Intraperitoneal instillation

- Group B patients were under direct vision received 25 mg of Inj. Bupivacaine (10 ml bupivacain 0.25% + 10 ml normal saline) instilled in the right sub diaphragmatic area via the sheath of the trocar.

Statistical analysis of pain scores was performed by using nonparametric analysis of variance. The analysis of age, weight and duration of operation was done by parametric analysis of one-way ANOVA. p value of less than 0.05 was considered significant.

Results

Total 60 patients were studied and the data were analyzed. 30 patients were given MRSB and 30

patients were given Intraperitoneal Instillation. There was no significant difference among the groups in Patients Demographic Data (**Table - 1**).

Table – 1: Patient demographic data.

Demographic	Group A (MRSB)	Group B (IP)
Age (years)	27.2 ± 5.03	29.1 ± 4.2
Male: Female	25:5	26:4
ASA I:II	23:7	25:5
Weight (kg)	63 ± 12	60 ± 10
Duration of operation (min)	31 ± 3.7	30.5 ± 2.09

After 6 hours, the median pain score was 3 in group A while it was 7 in group B. After 8 hours, the median pain score was 2 in group A compared with 5 in group B and after 10 hrs, the median score were 2 and 5 in group A, group B respectively (p<.001 and <0.004 respectively). No significant difference noted in pain score at 1 hour and 24 hour post laparoscopy among the two groups. The time for first rescue analgesic was 9±1.4 hours in group A while in group B it was 6 ±1.6. There were no complication related to performing MRSB and no allergic reaction to Bupivacaine was observed in any patients (**Table – 2**).

Table – 2: Visual Analogue pain Score.

Postoperative assessment period	Group A (MRSB)	Group B (IP)
1 hour	3 ± 2	3 ± 2
6 hour	3 ± 1	7 ± 1
8 hour	2 ± 1	5 ± 2
10 hour	2 ± 1	5 ± 1
24 hour	4 ± 2	4 ± 2

Discussion

In Diagnostic laparoscopy, the largest group of patients is young and healthy; the main problem is postoperative pain. Pain intensity is significant but nature of pain is different from laparotomy.

The laparoscope is inserted with the aid of large-bore trocar, usually through a midline sub umbilical incision in order to penetrate the rectus sheath and peritoneum. Successful blockade of the relevant inter costal nerves within the rectus sheath produce full thickness anaesthesia of anterior abdominal wall and provide postoperative analgesia. Post laparoscopic pain results from phrenic nerve irritation caused by residual gas [1], stretching of the intraabdominal cavity [2] and peritoneal inflammation [3]. Various treatment have been proposed to provide pain relief in laparoscopy including rectus sheath block [4], preoperative administration of non steroidal anti-inflammatory drugs [5], thoracic epidural analgesia [6], evacuation of residual CO₂ [7, 8], intra incisional local anaesthetic. Successful blockade of the relevant inter costal nerves within the rectus sheath produce full thickness anaesthesia of anterior abdominal wall and provide postoperative analgesia. Duration of post operative analgesia was prolonged in MRSB block compared to intraperitoneal instillation because double dose of inj. Bupivacaine (0.25% 10 ml on each side than 0.25% 10 ml) was used for bilateral MRSB. Smith BE, et al. [4], studied BRSB in diagnostic laparoscopy and compared with control group. They used 15 ml of Bupivacaine 0.25% at the end of the operation. They found block was significantly effective at 1, 6 and 10 hours postoperatively as compared to control group. One study compared rectus sheath block with intraperitoneal instillation and incisional infiltration and they found that rectus sheath block was producing prolonged analgesia (24 hours) as compared to intraperitoneal instillation and incisional infiltration. They had given block before incision with IV premedication. The duration of postoperative analgesia was prolonged than our study. This may be due to use of pre-emptive analgesia i.e. before incision [9, 10]. The rectus sheath, which encloses the rectus muscle, extends from the xiphoid and 5th-7th costal cartilages to pubic crest. A rectus sheath block consists of a blockade of lower thoracic nerves (T7-T12). Bilateral rectus sheath block has been used successfully for the repair of umbilical and

paraumbilical hernias in Pediatric surgery [11]. In diagnostic laparoscopy there is less cutting and manipulation of visceral organs so blockade of the lower thoracic nerve by MRSB is more effective in reducing pain. There were no complications like peritoneal puncture; Perforation of bowel, visceral puncture, retroperitoneal hematoma, inferior epigastric vessel punctures [12, 13].

Conclusion

USG guided modified rectus sheath block (MRSB) provides prolonged post operative analgesia than intraperitoneal instillation in diagnostic laparoscopy.

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