Asian Pacific Journal of Reproduction

Journal homepage: www.apjr.net

Document heading doi: 10.1016/S2305-0500(13)60136-0

Intraperitoneal lidocaine & tenoxicam for pain relief after gynaecological laparoscopy

Ibrahim A Abdelazim[1,2*], Mohammed Al-Kadi[1], Maged Mahmoud El Shourbagy[1], Ahmed Abdelazim Mohamed[2,3] Mohannad Lutfi Abu faza[2]

[1]*Department of Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University, Cairo, Egypt*

[2]*Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait*

[3]*Department of anesthesia & ICU, Faculty of Medicine, Benha University, Cairo, Egypt*

ARTICLE INFO

Article history:
Received 22 May 2013
Received in revised form 26 May 2013
Accepted 27 May 2013
Available online 20 June 2012

Keywords:
Intraperitoneal
Lidocaine
Tenoxicam
Pain
Laparoscopy

ABSTRACT

Objective: To detect the effect of intra-peritoneal instillation of local anesthetic with or without NSAIDs on pain relief after gynecological laparoscopy. **Methods:** Seventy five patients scheduled for laparoscopy were included in the study and randomly divided into three groups. At the end of the laparoscopic procedure, 100 mL normal saline in the first group, or 100 mL normal saline contains 200 mg lidocaine in the second group, or 100 mL normal slaine containing 200 mg lidocaine and 20 mg tenoxicam in the third group were splashed into the pelvis by the surgeon. Post-operative pain were monitored and compared. **Results:** The incidence and severity of immediate postoperative shoulder pain reduced from 44% of patients scoring 2-5 in saline group to 16% scoring 2-3 in lidocaine group and 8% scoring 2-3 in lidocaine-tenoxicam group. Compared with saline group, abdominal pain scores were significantly lower in lidocaine group and lidocaine-tenoxicam group over 24 hours after surgery. At 12 and 24 hours after surgery, abdominal pain scores were significantly reduced in lidocaine-tenoxicam group compared with lidocaine group. No pain on deep respiration was reported in 84%, and 68% in lidocaine-tenoxicam and lidocaine groups respectively compared to 12% in those in the saline group. The mean time to first request for analgesia was increased from (2.3 ±1.9) hours in saline group to (4.4 ± 2.4) hours in lidocaine group and to (8.3 ± 10.2) hours in lidocaine-tenoxicam group. **Conclusion:** Intraperitoneal balanced analgesia (local anesthetics ± NSAIDS) is a simple and safe technique for analgesia following gynaecological Laparoscopy.

1. Introduction

Laparoscopy has been used worldwide for diagnostic procedures as in the cases of infertility, evaluation of adnexal mass and the addition of video equipments has led to advanced operative laparoscopy for removal of ectopic pregnancies, endometriomas, and myomas[1].

Postoperative pain is known to be very irritating to the patient in the recovery room. Postoperative pain relief is essential because it decreases the postoperative chest complication and decreases the postoperative period[2].

The most widely used method for pain relief remains injection of narcotics with their known disadvantages of drowsiness, vomiting, respiratory depression and addiction. Local blockers give satisfactory pain relief with less or no drowsiness or addiction[3].

Intraperitoneal local anesthetic has been shown in some studies to reduce postoperative pain following laparoscopic surgery but the effect seems to be transient[4,5].

Intraperitoneal lidocaine results in long lasting reduction of pain after a single administration and was found to be effective in reducing post laparoscopic shoulder pain[6].

*Corresponding author: Ibrahim A Abdelazim, MD, Department of Obstetrics & Gynecology, Faculty of Medicine, Ain Shams University, Cairo, Egypt, and Ahmadi Hospital, Kuwait Oil Company (KOC), Kuwait.
Tel: (+965) 66551300
Fax: (+965)23984184
E-mail: dr. ibrahimamwar@gmail.com

In a systemic review, pain relief was observed in seven of the 13 randomized controlled trials with intraperitoneal instillation of local anesthetics after laparoscopic cholecystectomy[7].

Non steroids anti-inflammatory drugs (NSAIDS) can acts both centrally and peripherally, but local applications to the site of injury may lead to effective concentration in the inflamed tissue with less systemic effect[8].

2. Materials and methods

2.1. Patients

Seventy five (75) patients scheduled for laparoscopy were included in the study after informed consent and approval of the study protocol by the hospital ethics committees. A letter containing essential information was read and signed by the patients. A visit with the anesthetist prior to the patient's arrival in the operating room to minimize cancellations was considered.

2.2. The laparoscopic procedure

The laparoscopic procedure was done in a standard fashion. At the end of the procedure, 100 mL normal saline in the first group (Group 1, Saline group); or 100 mL normal saline contains 200 mg lidocaine (concentration 0.2%) in the second group (Group 2, Lidocaine group); or 100 mL normal saline containing 200 mg lidocaine and 20 mg tenoxicam in third group (Group 3, Lidocain e-tenoxicam group); were splashed into the pelvis by the surgeon using a suction-irrigation tube and the patients were kept in Trendlenberg's position to bathe the tissues with the test solution.

2.3. Post-operative pain monitoring

Tramadol 100 mg 4 hourly intramuscular was prescribed for patients upon request as analgesic, to be given ward staff, that were unaware of the nature of the intraoperative analgesia. Additional prescriptions of tramadol up to 100 mg were available on request. The ward staff was instructed to omit these 4 hourly doses if they considered the patient was pain-free. The investigator, who was blind to the group allocation of the patient and to any postoperative analgesia administered, assessed the patients for any pain with respiration or shoulder pain. The time from the end of surgery until the first request for analgesia was noted.

Shoulder pain was recorded on a five-point scale, and a verbal ranking score (VRS) was used to assess pain with respiration immediately on return to the ward. The patients were asked to complete 10-cm linear analogue scale for abdominal pain, which ranged from 0 for no pain at all to 10 for the worst pain imaginable. Abdominal pain scores, shoulder pain scores and vital data were recorded by the investigator immediate, 2 hours, 6 hours, 12 hours, and 24 hours postoperatively.

Side effects (nausea, vomiting, and dizziness) and recovery variables (return of bowel function, liquid intake and hospital discharge) were assessed by the ward staff.

Patients were ready for discharge from the hospital when they were afebrile, oral fluid was tolerated without discomfort and bowel function had returned.

2.4. Statistical analysis

Data was collected tabulated then statistically analysed using Statistical Package for Social Sciences (SPSS); computer software version [15]. Numerical variables were presented as mean and standard deviation (± SD), while categorical variables were presented as number (n) of cases and percentage (%). Chi-square (x^2) test was used for comparison between groups as regard qualitative variables. ANOVA test used to comparison between independent variable. Post Hoc test to detect least significant difference (LSD). A difference with P value <0.05 was considered statistically significant, otherwise it was insignificant.

3. Results

The three groups were matched, with no significant differences regarding the mean age, weight, height, parity, and duration of surgery and indication for laparoscopy (Table 1).

The incidence and severity of immediate postoperative shoulder pain reduced from 44% of patients scoring 2-5 (9 patients out of 25) in saline group to 16% scoring 2-3 (4 patients out of 25) in lidocaine group and 8% scoring 2-3 (2 patients out of 25) in lidocaine-tenoxicam group (Table 2) .

The severity and duration of shoulder pain experienced by patients at all time intervals (2, 6, 12 and 24 hours) after surgery were reduced in lidocaine and lidocaine-tenoxicam groups compared with saline group. There was significantly less pain in lidocaine and lidocaine-tenoxicam groups than saline group immediately on awakening the patients postoperatively (Table 3).

Compared with saline group, abdominal pain scores were significantly lower in lidocaine group and lidocaine-tenoxicam group over 24 hours after surgery (P<0.05). At 12 and 24 hours after surgery, abdominal pain scores were significantly reduced in lidocaine-tenoxicam group compared with lidocaine group (P<0.001) (Table 4) . No pain on deep respiration (score 1) was reported in 84%, and 68% in lidocaine-tenoxicam and lidocaine groups respectively compared to 12% in those in the saline group (Table 5). There were no statistically significant differences between the three groups as regard to pulse and temperature and blood pressure immediately after awakening the patients and at 2,6,12 and 24 hours after surgery. The mean time to first request for analgesia was increased from (2.3 ± 1.9) hours in saline group to (4.4 ± 2.4) hours in lidocaine group and to (8.3 ± 10.2) hours in lidocaine-tenoxicam group. The time to first request for analgesia was significantly higher in lidocaine-tenoxicam groups than the other two groups

(P<0.05). The cumulative dose of tramadol in 24 hours was significantly lower in lidocaine–tenoxicam group (80 ± 80 mg) than lidocaine group (110 ± 90 mg) and saline group (290 ± 140 mg) (P<0.05). Nausea was experienced by 10 patients in saline group (5 with vomiting and 3 with repeated vomiting), 8 patients in lidocaine group (4 with vomiting and 1 with repeated vomiting) and 5 patients in lidocaine–tenoxicam group (3 with vomiting and 2 with repeated vomiting) (Table 6). The mean time to passing flatus was (10.0 ± 4.5) hours in saline group compared with (9.2 ± 4.4) and (7.7 ± 5.0) in lidocaine and lidocaine –tenoxicam groups; respectively. Duration to fluid intake was also shorter in lidocaine–tenoxicam than other two groups (P<0.05), also there was significant difference as regard time to hospital discharge between lidocaine–tenoxicam and saline group (P<0.05) (Table 6).

Table 1

Patients characteristics, duration and indications of laparoscopy (n=25).

Variables	Group 1	Group 2	Group 3
Age (years)	27.7 ± 8.2	26 ± 5.2	27 ± 6.8
Weight (kg)	72.9 ± 13.1	69.9 ± 10.3	75.8 ± 9
Height (cm)	159.9 ± 5.0	161.4 ± 2.9	162.6 ± 4.6
Parity	0.7 ± 0.9	0.5 ± 0.2	0.9 ± 1.7
Indication of laparoscopy			
Infertility	20 (80%)	22 (88%)	19 (76%)
Others indication of laparoscopy	5 (20%)	3 (12%)	6 (24%)
Duration of laparoscopy (Minutes)	51.0 ± 12.0	45.0 ± 15.6	40.0 ± 12.6

Table 2

Number of the patients developed immediate post operative shoulder pain in the three studied groups.

Score	Degree of pain	Group 1	Group 2	Group 3
1	No pain	14	21	23
2	Discomfort in the shoulder but no pain	2	2	1
3	Light pain (no analgesia required)	3	1	1
4	Moderate pain (analgesia required)	5	1	–
5	Severe pain (analgesia and sedation required)	1	–	–

Table 3

The mean visual analogue score (VAS) of shoulder pain immediately postoperative, 2, 6, 12 and 24 hours in the three studied groups.

Variables	Group 1	Group 2	Group 3
At awakening	1.8 ± 2.6	0.7 ± 1.2*	0.3 ± 0.6*
After 2 hours	0.7 ± 0.9	0.6 ± 1.1	0.4 ± 0.7
After 6 hours	0.6 ± 0.9	0.4 ± 0.9	0.2 ± 0.4
After 12 hours	0.6 ± 1.0	0.5 ± 1.2	0.2 ± 1.2
After 24 hours	0.5 ± 1.0	0.4 ± 1.6	0.2 ± 1.8

*Statistically significant from Saline (Group 1)

Table 4

The mean visual analogue score (VAS) of abdominal pain immediately postoperative, 2, 6, 12 and 24 hours.

Variables	Group 1	Group 2	Group 3
Immediate postoperative	6.3 ± 1.9	3.3 ± 2.7*	2.6 ± 2.4*
After 2 hours	4.7 ± 2.0	3.6 ± 2.5*	3.4 ± 2.0*
After 6 hours	3.6 ± 2.3	2.5 ± 2.0*	2.0 ± 1.7*
After 12 hours	3.0 ± 2.0	1.7 ± 1.8*	1.1 ± 1.5*#
After 24 hours	1.7 ± 1.8	1.0 ± 1.7*	0.5 ± 0.7*#

* Statistically significant from Saline group (Group 1), #Statistically significant from Lidocaine group (Group 2).

Table 5

Number of the patients developed immediate post operative pain with respiration in the three studied groups.

Score	Degree of pain	Group 1	Group 2	Group 3
1	No pain	3	17	21
2	Discomfort in the shoulder but no pain	9	6	3
3	Light pain (no analgesia required)	8	1	1
4	Moderate pain (analgesia required)	4	–	–
5	Severe pain (analgesia and sedation required)	1	–	–

Table 6
Comparison of side effects and recovery variables in the three studied groups.

Variables	Group 1	Group 2	Group 3
Nausea	10 (40%)	8 (%)	5 (20%)
Vomiting	5 (20%)	4 (16%)	3 (12%)
Repeated vomiting	3 (12%)	1 (4%)	2 (8%)
Tinnitus, circumoral numbness	0 (0%)	0 (0%)	0 (0%)
Time to passing flatus (hours)	10 .0± 4.5	9.2 ± 4.4	7.7 ± 5.0*
Time to liquid intake (hours)	10.2 ± 4.5	9.1 ± 4.4	7.8 ± 5.0*
Time to Hospital discharge (hours)	31.2 ± 8.9	27 ± 0.0	22 ± 3.7*

* Statistically significant from Saline (Group 1) & Lidocaine (Group 2).

4. Discussion

Shoulder pain after laparoscopy may occur in 35% to 63% of patients. There is a significant correlation between the width of gas bubble and pain score, this pain can be reduced by application of local anesthesia under the diaphragm or by aspiration of the gas[9].

Windsor and colleagues found that the recommended dose of tenoxicam 20 mg may be inadequate for rapid or effective postoperative pain relief, even when given intravenously[10]. In contrast, Wang et al, demonstrated that the addition of small dose of tenoxicam (2 mg) to lidocaine 1 % is adaquate for postoperative pain relief[11].

In this study, the severity and duration of shoulder pain experienced by patients at all time intervals after surgery were reduced in lidocaine and lidocaine-tenoxicam groups compared with saline group. Compared with saline group, abdominal pain scores were significantly lower in lidocaine group and lidocaine-tenoxicam group over 24 hours after surgery. No pain on deep respiration was reported in 84% and 68% in lidocaine-tenoxicam and lidocaine groups respectively. The mean time to first request for analgesia was increased in lidocaine group and lidocaine-tenoxicam group.

In this study, it is clear that the combination of intra-peritoneal lidocaine and tenoxicam prolongs the duration of analgesia and delays the need for postoperative analgesia after laparoscopic procedures.

Also, in this study, the duration of action of local anesthetics was much longer than expected and cannot be explained by either systemic effects or the classic local action of local anesthetics. It seems that the preventive treatment of postoperative pain may substantially reduce the analgesic requirements after surgery. In this study, shoulder pain scores were significantly less in balanced analgesia group compared with lidocaine group, because the use of two analgesics acting by different mechanisms result in additive or synergistic analgesia.

Narchi & colleagues demonstrated that shoulder pain is a frequent complication in the postoperative period and is reported in 35% – 63% of cases after laparoscopy. In Narchi study, a combined local anesthetic/adrenaline solution was chosen because the addition of adrenaline led to a lower peak serum concentration of drug[12].

The cumulative dose of tramadol in 24 hours was significantly lower in lidocaine-tenoxicam group than lidocaine group and saline group. Duration to fluid intake was also shorter in lidocaine-tenoxicam than other two groups; also there was significant difference as regard time to hospital discharge between lidocaine-tenoxicam and saline group.

Multiple controlled trials confirm the opioid-sparing effects and benefit of NSAIDS usage in acute postoperative pain[13]

Postoperative nausea and vomiting are common after laparoscopy; this is the main reason preventing discharge from hospital on the day of operation[14,15].

Prophylactic antiemetics are included as a part of routine anesthetic management in many centers before laparoscopy [16] and the use of NSAIDS does not seem to reduce the incidence of nausea and vomiting, according to most published studies. It seems clear that the use of NSAIDS for pain after major surgery results in reductions in severity of postoperative pain and reduction in opioid requirement which may lead to reduction in the incidence of postoperative nausea and vomiting[17].

In this study, time to liquid intake, and time for hospital discharge were significantly shorter in lidocaine-tenoxicam group of patients compared with other groups.

Intraperitoneal instillation of tenoxicam prevents the inflammatory reactions following surgical trauma and this may explain the rapid bowel recovery and earlier hospital discharge in lidocaine-tenoxicam group. Intraperitoneal instillation of NSAIDS (tenoxicam), is associated with improved postoperative pain scores, reduced postoperative opioid consumption with reduction in incidence of postoperative nausea and vomiting, which may also explain the early hospital discharge in lidocaine-tenoxicam group[18].

Conflict of interest statement

No actual or potential conflict of interest is related to this manuscript.

Acknowledgments

I would like to express my appreciation and acknowledgment to Doctor/ Mohammed Al-Kadi, Doctor/ Maged Mahmoud El Shourbagy, Doctor/ Ahmed Abdelazim Mohamed, Doctor/ Mohannad Lutfi Abu faza, for their continuous advice for publication of this manuscript.

References

[1] Feste J. Laser laparoscopy CO_2. In: keye WR Jr.(ed) *laser surgery in obstetrics and gynaecology* 1990. 2nd ed. Chigago: year Book Medical Publishers; 1990, p. 35-45.

[2] Elhakim M, Elkott M, Ali NM. Intra-peritoneal lidocaine for postoperative pain after laparoscopy. *Acta Anaethesiol Scand* 2000; **44**: 280-284.

[3] Smith G. The management of post operative pain. In: *Text book of anaesthesia.* Edinburgh: ChurchHili Livingstone; 1990, p. 449-457.

[4] Bisgaard T, Klarskov B, Kristianen VB. Multi-regional local anathetic infiltration during laparoscopic cholecystectomy in patients receiving blinded, placebo controlled study. *Analg* 1999; **89**: 1017- 1020.

[5] Dath D, Park AE. Randomized controlled trail of bupivacaine injection to decrease pain after laparoscopic cholecystectomy. *Can J Surg* 1999; **42**: 284-288.

[6] Cunnife MG, Mc Aanena OJ, Dar MA. A prospective randomized trial of intra-operative bupivacaine irrigation for management of shoulder pain following laparoscopy. *Am J Sury* 1998; **176**(3): 258-261.

[7] Moiniche S, Jjorgensen H, Wetterslev J. Local anesthetic infiltration for postoperative pain relief after laparoscopy: a qualitative and quantitative systematic review of intraperitoneal, port-site infiltration and mesosalpinx block. *Anesth Analg* 2000; **90**: 899-912.

[8] Bjorkman R. Central antinociceptive effects of NSAIDS and paracetamol. Experimental studies in the rat. *Acta Anesthesia. Scand* 1999; **39**: 1-44.

[9] McMahon AJ, Russell IT, Ramsay G. Laparoscopic and minilaparotomy cholecystectomy: a randomized trail comparing postoperative pain and pulmonary function. *Surgery* 1994; **115**: 533-539.

[10]Windsor A, Mcdonald P, Mumtaz T. The analgesic efficacy of tenoxicam versus placebo in day-case laparoscopy: a randomized parallel double-blind trial .*Anaesthesia* 1996; **51:** 1066-1069.

[11]Wang YL, Hsieh JR, Chung HS. The local addition of tenoxicam reduces the incidence of low back pain after lumbar epidural anesthesia. *Anesthesiology* 1998; **89**: 1414-1417.

[12]Narchi P, Benhamou D, Fernandez H. Intraperitoneal local anaesthetic for shoulder pain after day- case laparoscopy. *Lancet* 1991; **338**: 1569-1570.

[13]Yeh CC, Wu CT, Lee MS. Analgesic effects of perincisional administration of dextromethorphan and following laparoscopic cholecystectomy. *Acta Anaesthesiol Scand* 2004; **48**(8): 1049-1053.

[14]Holte K, Klarskov B, Christensen DS. Liberal versus restrictive fluid administration to improve recovery after laparoscopic cholecystectomy: a randomized, double-blind study. *Ann Surg* 2004; **240**(5): 892-899.

[15]Rusch D, Strasser C, Celik I. Vomiting after gynaecologic laparoscopy and under general anaesthesia is associated with changes in excretion of serotonin metabolites. *Anesthesist* 2004; **53**(3): 228-234.

[16]Nesek-Adam V, Grizelj-Stojcic E, Mrsic V. Prophylactic antiemetics for laparoscopic cholecystectomy: droperidol, metoclopramide, and droperidol pluse metoclopra. *J Laparo endosc Adv Surg Tech A* 2004; **14**(4): 212-218.

[17]Moote C. Efficacy of NSAIDS in the management of postoperative pain. *Drugs* 1992; **44**: 14-30.

[18]Song D, Chung F, Ronayne M. Fast-tracking does not reduce nursing workload after ambulatory surgery. *Br J Anaesth* 2004; **93**(6): 756-758.