ORIGINAL RESEARCH PAPER | Medical Science | Volume : 6 | Issue : 11 | November 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

Comparative Effect of Intravenous Paracetamol, Lornoxicam and Tramadol on Postoperative Analgesia in Unilateral Hernia Surgery

KEYWORDS: Intravenous, paracetamol, lornoxicam, tramadol

*** Catal Turgut**
Department of Anaesthesiology and Reanimation, Korkuteli state hospital, Antalya, Turkey

*** Ozyurt Erhan**
Department of Anaesthesiology and Reanimation, Antalya Education and Research Hospital, Antalya, Turkey, * corresponding author

ABSTRACT *We aimed at comparing the analgesic efficacy and side-effect incidence of paracetamol, lornoxicam and tramadol given intravenously for postoperative pain in patients undergoing unilateral inguinal hernia surgery. A total of 49 patients over 18 years of age, ASA I-II were included. Patients were randomized to receive one of the three study drugs. Pain was assessed in all patients using the Visual Analogue Scale(VAS). VAS scores in study groups showed highest scores at the first hour in paracetamol group, while scores in tramadol group were lower. The groups were comparable in terms of VAS scores after 1 hour, until assessments at 24 hours, where paracetamol patients had highest and tramadol patients had lowest VAS scores (P<0.05). In this study tramadol exhibited highest level of analgesic efficacy followed by lornoxicam, and paracetamol.*

Introduction

Although the past two decades have witnessed newer insights into the significance of postoperative pain and advances in its management, ideal method of postoperative analgesia remains to be defined. Many patients are destined to receive inadequate treatment for postoperative pain, despite improvements in our understanding on the pathophysiology and management of pain and despite the introduction of newer agents and complex administration schedules. Studies suggest that up to 80% of patients report moderate to severe pain after surgery.[1]

The most frequently utilized analgesic agents, i.e. narcotics, are associated with a number of adverse effects including nausea, vomiting, itching, urinary retention, respiratory depression, sedation, or central nervous system depression. On the other hand, local anesthetics may lead to systemic toxicity, prolonged sensorial, motor, or venous stasis, hypotension, and urinary retention due to sympathetic blockade.[2, 3] Patients undergoing surgery will unquestionably prefer effective pain control with rapid onset of action. Intravenous route is frequently preferred for providing rapid analgesia and to avoid gastrointestinal (GIS) intolerance. Among others, paracetamol, lornoxicam, and tramadol are commonly used for postoperative analgesia. The current study aimed at comparing the analgesic efficacy and side-effect incidence of paracetamol, lornoxicam and tramadol given intravenously (IV) for postoperative pain in patients undergoing unilateral inguinal surgery.

Materials and Methods

After the study had been approved by the local ethic committee, patients over 18 years of age, ASA I-II, who underwent unilateral inguinal hernia surgery were included. Exclusion criteria included the following: occurrence of complications during surgery, duration of surgery exceeding 2 hours and presence of a history of hypersensitivity to study medications, coagulation disorders, blood dyscrasia, malignancy, use of cytotoxic medications, asthma, aspirin sensitivity, hepatic disorders, GIS disorders, pregnancy, renal failure, alcohol dependence, respiratory problems, and convulsions. Patients were randomized into three postoperative analgesia groups. All patients enrolled in the study received a standardized general anesthesia regimen. After standard monitoring including non-invasive arterial pressure, electrocardiography, and pulse oximetry was established in the operating room, anesthesia was induced with propofol 2 mg/kg, fentanyl (1µg/kg) and muscle relaxation was provided with rocuronium bromide 0.6 mg/kg. Anesthesia was maintained with 60% nitrous oxide in oxygen and sevoflurane 1-1.5%. None of the patients received an opioid after induction. At the time of the closure of the fasciae, in group P: 20 mg/kg paracetamol, in group L: 8 mg lornoxicam, and in group T: 1 mg/kg tramadol were intravenously received. Then sevoflurane concentration was reduced to 0.5%, and the anesthetic gases were completely discontinued with the placement of the last skin suture. Tracheal extubation was provided after neuromuscular blockade was reversed using neostigmine 0.04 mg/kg and atropine 0.02 mg/kg. Pain was assessed by the same researcher in all patients using the Visual Analogue Scale (VAS) (0= no pain, 10= worst pain) at 0, 15, 30, 45 minutes and 1, 2, 4, 6, 12, 24 hours postoperatively.

In those subjects requiring additional analgesia, the time to first analgesia was recorded. Patients experiencing pain were given intramuscular diclofenac sodium at a dose of 75 mg. Metoclopramide 10 mg IV was administered when nausea and vomiting were present.

Statistical analysis of study data was performed using SPSS for windows (version 15.0 SPSS Inc., Chicago, IL, USA). The results were assessed with 95% confidence intervals at a significance level of P<0.05.

RESULTS

A total of 49 patients between 21 and 60 years of age with a mean age of 40.8 ± 10.54 years were included in this study. There were 16, 17, and 16 patients in paracetamol, lornoxicam, and tramadol groups respectively. There was no statistically significant difference between the groups in the terms of demographic data (P>0.05) (Table 1). The earliest administration of additional analgesia was recorded in paracetamol group and the latest in tramadol group (P<0.01) (Table 2).

Volume : 6 | Issue : 11 | November 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

	Group P Mean ± sd	Group L Mean ± sd	Group T Mean ± sd	P
Sex (male/female) (n)	9/7	11/6	10/6	0.876
Age	39.19 ± 11.68	42.53 ± 9.31	40.56 ± 10.97	0.666
ASA I/II (n)	10/6	11/6	11/5	0.931
Weight (kg)	73.25 ± 7.33	72.58 ± 9.07	73.43 ± 6.77	0.947

Table 1 Demographic characteristics of patients

Table 2 The time to first analgesic in study groups

	Group P Mean ± sd	Group L Mean ± sd	Group T Mean ± sd	P
The time to first additional analgesia (min)	110.63 ± 83.04	157.06 ± 87.16	251.25 ± 152.13	0.003

VAS scores in study groups (Table 3) showed highest scores at 0, 15, 30, 45, and 60 minutes in paracetamol group, while scores in tramadol group were lower. The groups were comparable in terms of VAS scores after 1 hour, until assessments at 24 hours, where paracetamol patients had highest and tramadol patients had lowest VAS scores (P<0.05)

Table 3 VAS scores in study groups

	Grup P Mean ± sd	Grup L Mean ± sd	Grup T Mean ± sd	P
0. min	3,06 ± 0,57	2,65 ± 1,00	2,19 ± 0,75	0,007
15. min	3,19 ± 0,83	2,65 ± 0,79	2,06 ± 0,57	0,001
30. min	3,44 ± 0,81	2,76 ± 0,90	2,31 ± 0,79	0,002
45. min	3,63 ± 0,81	2,94 ± 1,14	2,50 ± 0,82	0,004
1. h	4,44 ± 1,09	3,41 ± 1,37	2,75 ± 1,00	0,001
2. h	3,63 ± 1,54	3,65 ± 1,22	3,13 ± 1,31	0,447
4. h	2,63 ± 1,50	3,35 ± 1,37	3,75 ± 1,65	0,144
6. h	2,38 ± 1,15	2,12 ± 0,86	2,63 ± 1,89	0,596
12. h	1,75 ± 1,18	1,76 ± 0,75	1,44 ± 1,15	0,251
24. h	1,50 ± 0,73	1,29 ± 0,69	0,88 ± 0,62	0,039

Postoperative nausea and vomiting occurred in two (12.5%), one (5.9%), and five (31.2%) patients in paracetamol, lornoxicam, and tramadol groups respectively (P>0.05). Itching was noted in only 4 patients (25%) in tramadol group.

DISCUSSION

Non-opioid analgesics are commonly used alone or as a complementary therapy to opioid-based analgesia for the management of postoperative pain. Our results show that tramadol provided the most effective analgesia both in terms of the time to first additional analgesia and also in terms of VAS scores, while paracetamol emerged as the agent with the least efficacy.

Development of parenteral formulations of NSAIDs has allowed their use in the management of postoperative pain. During short term treatment, these agents are both effective and well tolerated, representing a viable alternative to opioid analgesics.

Paracetamol

Intravenous administration of this agent negates the need for gastrointestinal absorption as well as bypassing the hepatic first-pass elimination, allowing higher analgesic efficacy to be achieved as compared to other routes of administration.[4]

The analgesic efficacy of paracetamol in the treatment of postoperative pain is similar to that of NSAIDs.[5, 6] And a reliable alternative in patients feared the side effects of NSAIDs.[7, 8] Also, their concurrent administration has been reported to reduce the need for narcotic analgesics.[4, 9] Despite these, they have also been reported to lack adequate efficacy in the control of severe pain when compared with tramadol.[10] Consistent with these observations, paracetamol also showed lower analgesic efficacy in this study as compared to tramadol, thus it may be combined with tramadol, particularly in the treatment of postoperative severe pain.

Lornoxicam

Latest advances in pharmaceutical industry resulting in the development of more effective synthetic molecules have paved the way for increased utility of NSAIDs. Lornoxicam, a newer NSAID, has a distinctive role in the management of postoperative pain, since it has been shown to provide similar efficacy to narcotic agents in many painful conditions as well as in postoperative pain.[11] Although similar efficacy has been previously reported for lornoxicam administered at a dose of 8 mg and tramadol,[12] tramadol was found to be more effective than lornoxicam in the current study.

Opioids

Opioids, which also emerged as the most effective analgesic in the current study, are commonly preferred for the treatment of moderate to severe pain, although they may also be associated with certain dose-dependent untoward effects and adverse postoperative effects. Therefore, a recent trend for combining opioids with non-opioid analgesics has been noted.[13]

Side Effects

Nausea and vomiting represented the most common side effect among our study participants, and tramadol patients had highest occurrence of these effects. A major cause of postoperative nausea and vomiting is the use of opioid-like agents such as tramadol and opioid derivatives.[14] However it should also be borne in mind that these two effects may also be associated with the residual effect of anesthetic gases as well as the surgical procedures performed. Tramadol patients also reported itching, in addition to nausea and vomiting.

CONCLUSION

In this study involving a group of patients undergoing surgical repair of unilateral inguinal hernia who are expected to experience moderate to severe postoperative pain postoperatively, tramadol exhibited highest level of analgesic efficacy followed by lornoxicam, and paracetamol. We also believe that combining tramadol with other agents may prove to be effective in reducing the frequency of side effects.

Volume : 6 | Issue : 11 | November 2016 | ISSN - 2249-555X | IF : 3.919 | IC Value : 74.50

References

1. Golembiewski, J. and J. Dasta, *Evolving Role of Local Anesthetics in Managing Postsurgical Analgesia.* Clin Ther, 2015. **37**(6): p. 1354-71.
2. Wall, P.D., *The prevention of postoperative pain.* Pain, 1988. **33**(3): p. 289-90.
3. Kehlet, H. and K. Holte, *Effect of postoperative analgesia on surgical outcome.* Br J Anaesth, 2001. **87**(1): p. 62-72.
4. Arici, S., et al., *Preemptive analgesic effects of intravenous paracetamol in total abdominal hysterectomy.* Agri, 2009. **21**(2): p. 54-61.
5. Zhou, T.J., J. Tang, and P.F. White, *Propacetamol versus ketorolac for treatment of acute postoperative pain after total hip or knee replacement.* Anesth Analg, 2001. **92**(6): p. 1569-75.
6. Hynes, D., M. McCarroll, and O. Hiesse-Provost, *Analgesic efficacy of parenteral paracetamol (propacetamol) and diclofenac in post-operative orthopaedic pain.* Acta Anaesthesiol Scand, 2006. **50**(3): p. 374-81.
7. Romsing, J., S. Moiniche, and J.B. Dahl, *Rectal and parenteral paracetamol, and paracetamol in combination with NSAIDs, for postoperative analgesia.* Br J Anaesth, 2002. **88**(2): p. 215-26.
8. Hyllested, M., et al., *Comparative effect of paracetamol, NSAIDs or their combination in postoperative pain management: a qualitative review.* Br J Anaesth, 2002. **88**(2): p. 199-214.
9. Binhas, M., et al., *Comparative effect of intraoperative propacetamol versus placebo on morphine consumption after elective reduction mammoplasty under remifentanil-based anesthesia: a randomized control trial [ISRCTN71723173].* BMC Anesthesiol, 2004. **4**(1): p. 6.
10. Dejonckheere, M., et al., *Intravenous tramadol compared to propacetamol for postoperative analgesia following thyroidectomy.* Acta Anaesthesiol Belg, 2001. **52**(1): p. 29-33.
11. Hillstrom, C. and J.G. Jakobsson, *Lornoxicam : pharmacology and usefulness to treat acute postoperative and musculoskeletal pain a narrative review.* Expert Opin Pharmacother, 2013. **14**(12): p. 1679-94.
12. Ilias, W. and M. Jansen, *Pain control after hysterectomy: an observer-blind, randomised trial of lornoxicam versus tramadol.* Br J Clin Pract, 1996. **50**(4): p. 197-202.
13. Kilicaslan, A., et al., *[The effects of intravenous paracetamol on postoperative analgesia and tramadol consumption in cesarean operations].* Agri, 2010. **22**(1): p. 7-12.
14. Leslie, K. and D.L. Williams, *Postoperative pain, nausea and vomiting in neurosurgical patients.* Curr Opin Anaesthesiol, 2005. **18**(5): p. 461-5.