A randomised controlled study to compare analgesic efficacy of sublingual buprenorphine versus intravenous tramadol in patients undergoing mastectomy

Krishna Sumanth Dokku, Srinivasa Shyam Prasad Mantha, Abhijit Nair, Basanth Kumar Rayani
Department of Anaesthesiology ,Basavatarakam Indo- American Cancer Hospital and Research Institute, Hyderabad,India

BUPE2021

INTRODUCTION:

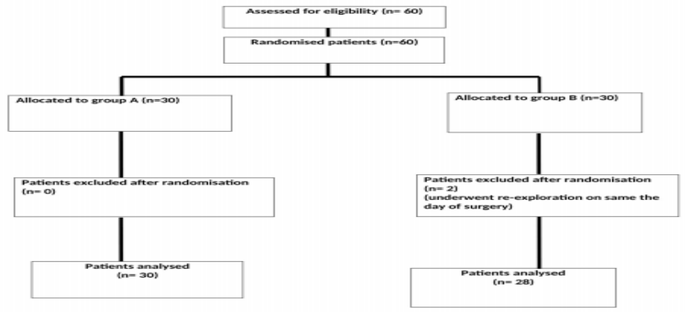
- Post mastectomy pain syndrome (PMPS) is a chronic neuropathic pain observed in women who undergo breast surgery. (25 - 60%).
- Buprenorphine hydrochloride is a partial μ-receptor agonist approved for managing acute surgical pain, cancer and non-cancer pain.
- Sublingual (SL) buprenorphine available as 200 ug tablets.

METHODS:

- Institutional Ethics Committee approval taken
- 60 female patients aged 18 to 65 years,ASA-PS class I and II, scheduled for elective, unilateral modified radical mastectomy were recruited
- Exclusion criteria: unable or unwilling to give informed consent; a history of (h/o) addiction, current usage of opioids or known allergy to opioids, severe respiratory, renal, hepatic, or cardiac issues, hemodynamically unstable, pregnant, h/o excessive nausea/vomiting during chemotherapy or previous h/o PONV and weighing < 50 kg .
- Two groups of 30 each . SL buprenorphine (Group A) or IV tramadol (Group B)
- Standard general anesthesia (lidocaine1.mg/kg, midazolam 0.03 mg/kg, fentanyl 2 ug/kg, propofol 2-2.5 mg/kg IV)
- Appropriately sized supraglottic airway
- All patients received IV paracetamol 1 gm during skin closure and 6th hrly after surgery for 24 hrs
- Neuromuscular blockade with 0.5 mg/kg atracurium, maintained on O2:air:isoflurane,reversed with neostigmine and glycopyrollate
- Visual analogue scale (VAS) to assess postoperative pain
- Group A patients were given SL buprenorphine 0.2 mg (ADDNOK®, Rusan Pharma Ltd.) and group B patients IV tramadol 1.5 mg/kg (max 100 mg) slowly in the immediate postoperative period and every 8th hourly for 24 hrs.
- IV morphine 3 mg as rescue analgesic if VAS score > 4.
- Pain (VAS scores), respiratory depression, sedation, hypotension, dizziness, PONV monitored in postoperative period.

RESULTS:

Consolidated Standards of Reporting Trials flow diagram



Variable	Group A	Group B	p-value
Age	48.63 +/- 9.54	47.96 +/- 8.06	0.7748
Weight	65.43 +/- 9.08	65.39 +/- 11.40	0.9881
BMI	28.01 +/- 3.44	28.15 +/- 4.64	0.8934
ASA-PS (I/II)	6/24	3/25	0.329
Side	16/14	17/11	0.570
PONV	12/18	8/20	0.360
Intra-operative fentanyl consumption	140.83 +/- 29.25	136.61 +/- 30.4	0.591
Rescue analgesic requirement	4/26	0/28	0.1129

Table 1: Comparison of demographic data, intra-operative fentanyl, rescue analgesia requirement and PONV

PONV- postoperative nausea/vomiting, ASA-PS: American Society of Anesthesiologists- physical status

Comparison of sedation over 24 hrs

Ramsay Sedation score	Group A	Group B	p-value
0	3	2.93 +/- 0.26	0.1411
1	2.43 +/- 0.57	2.39 +/- 0.50	0.7746
3	2.23 +/- 0.43	2.36 +/- 0.56	0.3465
6	2.3 +/0 0.47	2.5 +/- 0.51	0.124
12	2.77 +/- 0.43	2.82 +/- 0.39	0.6144
18	2.23 +/- 0.43	2.25 +/- 0.44	0.8847
24	2.03 +/- 0.18	2.04 +/- 0.19	0.9409

STATISTICAL ANALYSIS:

- Unpaired t-test was used for analysis for continuous data. The chi square (χ 2) test was used to compare qualitative variables. Statistical analysis was performed using GraphPad Prism 5 for Windows (GraphPad Software, La Jolla, CA, USA).
- A P value < 0.05 was considered statistically significant.

Comparison of VAS at rest and movement over 24hrs

VAS		Group A	Group B	p-value
1	Rest	1	1.07 +/- 0.26	0.1411
	Movement	1.6 +/- 0.56	1.89 +/- 0.42	0.0292
2	Rest	1.2 +/- 0.66	1.04 +/- 0.19	0.212
	Movement	1.7 +/- 1.02	1.64 +/- 0.56	0.794
3	Rest	1.1 +/- 0.31	1	0.0866
	Movement	1.33 +/- 0.48	1.68 +/- 0.55	0.0133
6	Rest	1.03 +/- 0.18	1	0.338
	Movement	1.3 +/- 0.47	1.43 +/- 0.5	0.317
12	Rest	1.13 +/- 0.35	1.14 +/- 0.36	0.918
	Movement	1.2 +/- 0.41	1.36 +/- 0.49	0.187
18	Rest	1.1 +/- 0.55	1	0.338
	Movement	1.27 +/- 0.78	1.25 +/- 0.44	0.921
24	Rest	1.07 +/- 0.25	1.11 +/- 0.31	0.59
	Movement	1.1 +/- 0.31	1.04 +/- 0.19	0.343

DISCUSSION:

- US- FDA has approved the use of buprenorphine for acute pain, chronic pain, and opioid dependence
- SL buprenorphine is an easy, non- invasive route of administration of a potent analgesic
- The bioavailability of SL buprenorphine appears to be comparable to IV morphine with equianalgesic efficacy
- The analgesic efficacy of SL buprenorphine appears comparable to IV tramadol at rest and movement for the first 24 hours after a mastectomy
- However, SL buprenorphine scores over tramadol in terms of ease of administration
- SL buprenorphine can be considered as part of multimodal analgesia for managing acute postoperative pain after breast surgeries

REFERENCES :

- Gong Y, Tan Q, Qin Q, Wei C.Prevalence of postmastectomy pain syndrome and associated risk factors: A large single- institution cohort study. Medicine (Baltimore). 2020;99: e19834.
- White LD et al . Efficacy and adverse effects of buprenorphine in acute pain management: systematic review and meta-analysis of randomised controlled trials. Br J Anaesth. 2018;120:668-78.
- Lim SCB et al. The Pharmacokinetics and Local Tolerability of a Novel Sublingual Formulation of Buprenorphine. Pain Med. 2019 ;20:143-52.