

Comparative Study of Efficacy of IV Paracetamol vs IV Tramadol for Postoperative Pain Relief After Cardiac Surgery

Manish Kela, Sanjeeta Umbarkar, Manjula Sarkar, Madhu Garasia,

Abstract

Introduction: NSAIDs and opioids are routinely used after cardiac surgery to mitigate postoperative pain. The aim of this study was to study efficacy of IV paracetamol vs. IV tramadol for postoperative pain relief, effects on haemodynamic stability, and adverse side effects.

Methods: After getting permission from ethics committee, all patients were divided into 2 groups of 30 each. One group received inj paracetamol (20 mg/kg) and other group received inj. tramadol (2 mg/kg). All patients received first dose of study drug at the end of surgery during skin suturing and doses were repeated at 8 hourly interval till 48 hours postoperatively. Haemodynamic parameters and pain score using VAS scale was evaluated at 8 hourly interval on day 1 and 2. Any rescue analgesia required and side effects of drug was noted.

Result: It was found that IV paracetamol and tramadol provide good analgesic cover after cardiac surgery carried out with midline sternotomy without affecting cardio respiratory function.

Introduction

After cardiac surgery patients experience incisional pain associated with sternotomy, chest tube insertion, and leg vein incision.^{1,2} Post operative pain is associated with adverse effects like myocardial ischaemia, respiratory insufficiency and thromboembolic complications.^{4,5} Opioids and NSAIDs are administered parenterally to alleviate such pain. Efficacy of such drugs is limited by side effects like respiratory depression, sedation, biliary spasm and (PONV).^{1,2,3} Therefore we need a drug which is not associated with these side effects.

Aims and Objective

To

1. Study efficacy of IV paracetamol vs. IV tramadol for postoperative pain relief
2. Effects on haemodynamic stability
3. Adverse side effects

Study design

It is a prospective randomised control study. After getting permission from ethics committee, all patients were divided into 2 groups of 30 patients each. One group received inj Paracetamol (20 mg/kg) and other group received inj. Tramadol (2 mg/kg). All patients in the 2 groups received first dose of study at the end of surgery during skin suturing and doses were repeated at 8 hourly intervals till 48

Department of Anaesthesia, Seth GS Medical College and KEM Hospital, Mumbai-400012.

hours postoperatively. Postoperatively haemodynamic parameters and pain score using VAS scale was evaluated at 8 hourly interval on day 1 and 2. Any rescue analgesia required and side effects of drug was noted.

Inclusion Criteria

All patients undergoing non emergency cardiac surgery carried out with standard midline sternotomy.

Exclusion Criteria

1. Age <18 years and > 80 years
2. LVEF < 30%,
3. Sr. Creatinine > 2 mg%
4. Sr. Bilirubin > 2 mg%,
5. Coagulopathy,
6. Recent myocardial infarction,
7. Uncontrolled diabetes,
8. Recent stroke/TIA within 6 months

Observation and Results

Parameters between the two groups were compared using Student 't' test and Chi - Square Test and p value < 0.05 is considered to be significant.

Demographical Data

Parameters	Paracetamol (N=30)	Tramadol (N=30)
Age (Yrs)		
Mean	34.17	38.60
SD	5.98	7.84
Range	24-48 Yrs	27-55 Yrs
Weight (Kgs)		
Mean	55.77	59.27
SD	4.80	5.28
Range	48-64 Kgs	42-70 Kgs
Height (Cms)		
Mean	160.30	159.93
SD	4.81	3.53
Range	150-170 Cms	150-170 Cms

By Student 't' Test P > 0.05 Not Significant

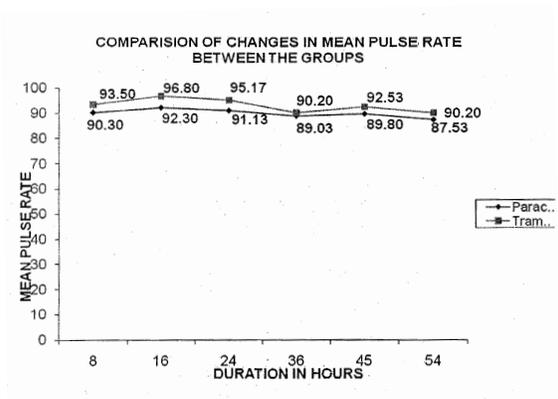
This data of patients shows that demographic parameters were comparable between the groups.

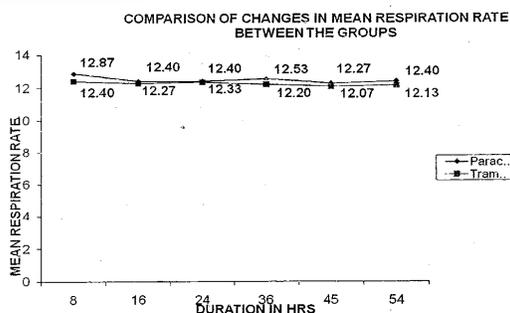
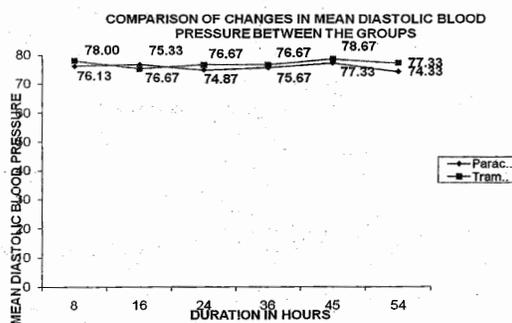
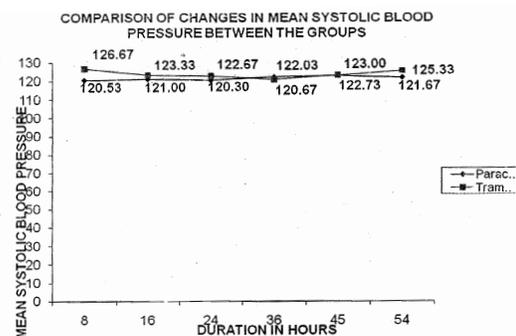
Profile of Diagnosis

Diagnosis	Paracetamol (N=30)		Tramadol (N=30)	
	No.	%	No.	%
As for AVR	02	06.7	01	03.0
ASD ICR	-	-	01	03.0
ASD Repair	02	06.7	07	06.7
AVR	01	03.0	01	03.0
CABG	02	06.7	04	13.3
CABG with IABP	-	-	01	03.0
CABG for TVD	02	06.7	-	-
DVR	02	06.7	04	13.3
LA Myxoma	01	03.0	01	03.0
MS for MVR	02	06.7	01	03.0
MVR	04	13.3	06	20.0
RHD with MS with MR with PH for MVR	07	23.3	-	-
RHD with MS for MVR	-	-	01	03.0
Thymectomy	03	10.0	04	13.3
VSD	-	-	01	03.0
VSD+PS in ICR	-	-	01	03.0
VSD Repair	01	03.0	01	03.0
ICR for TOF	01	03.0	-	-

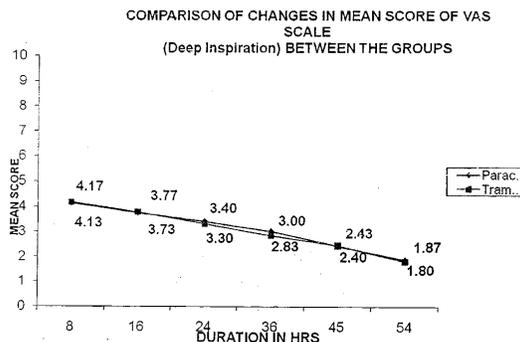
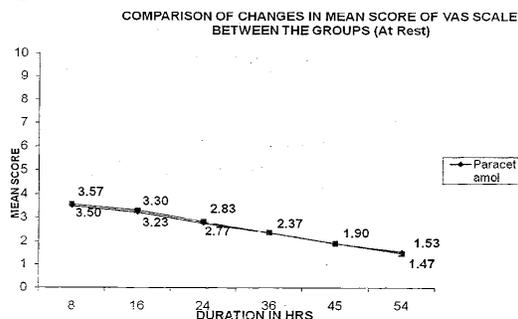
By Chi - Square Test P > 0.05 Not Significant

As per this Table, profiles of diagnosis are comparable between the two groups and difference is not significant.

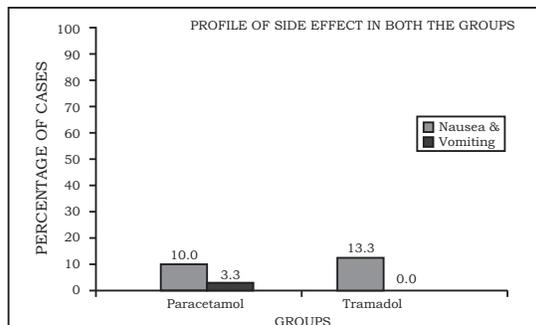




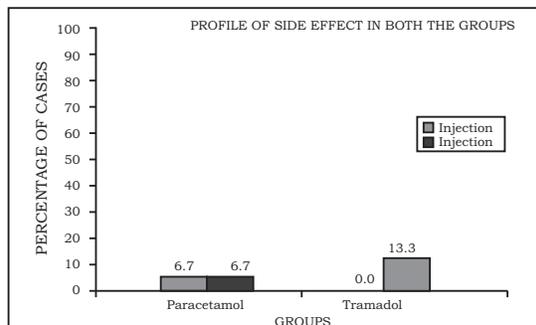
The above graphs show that the haemodynamic and respiratory parameters are comparable between the two groups and difference is not significant.



As per above graphs mean score of VAS Scale at rest and deep inspiration between the two groups was similar and difference was not significant. At the end of 24 hours mean VAS score had a significant reduction in both the groups, but if you compare the fall was same in both the groups and difference was not significant.



As per above 10.0% of the subjects in Paracetamol group and 13.3% out of total cases in Tramadol group suffered nausea and vomiting which were comparable and difference was insignificant.



As per this data 6.7 of the subjects in paracetamol group and 13.3% in tramadol group required rescue analgesia which is slightly higher than in paracetamol group.

Discussion

With the advent of fast track anaesthesia techniques the need for controlling postoperative pain has become a prime necessity in cardiac surgery both for the patient's well-being and for avoiding negative consequences provoked by the pain itself.² Opioids and NSAIDs are used for this but both have potentially harmful side effects.^{3, 4, 5} We studied the efficacy of paracetamol and tramadol, which has fewer side effects.

Tramadol is a centrally acting analgesic with a double-action mechanism: one based on the μ -receptor link and the other on serotonin and noradrenalin reuptake inhibition at the central synaptic level. Unlike traditional opioids, it does not interact with either haemodynamic or respiratory function. Furthermore, tramadol does not cause the appearance of tolerance, so it is therefore unnecessary to increase the dosage to maintain the analgesic effect over time. Paracetamol readily prepared in solution has only recently become available, so the literature is still scarce. In any case, a bioequivalence study has shown that 1 g of paracetamol is bioequivalent to 2 g of paracetamol and is safer at the local level. At recommended dosages, paracetamol is not associated with the increased incidence of nausea, vomiting and respiratory depression observed with opioids. Furthermore, paracetamol, due to its different action mechanism, interferes with neither platelet nor kidney function.

The data from our study have highlighted the fact that both paracetamol and tramadol has a good analgesic action and fewer side effects. The mean score of VAS Scale in two groups was similar and difference was not significant. At the end of 24 hours mean VAS score had a significant reduction in both the groups. Also the side effects and rescue analgesic required were comparable in both groups.

Conclusion

We conclude that IV paracetamol and tramadol provide good analgesic cover after cardiac intervention carried out with midline sternotomy without affecting cardio respiratory function.

Acknowledgments:

We thank Dr. Sanjay Oak, Dean, Director ME and MG, and Dr. Madhu Garasia Head of department of Anaesthesia, Seth G S Medical College and KEM Hospital, Mumbai for giving us the permission to publish this study. We would like to acknowledge all the staff members and resident of department of anaesthesia for helping us to conduct this study.

References

1. Lolter IV Paracetamol as adjunctive treatment for postoperative pain relief after cardiac surgery. double blind randomised controlled trial; Cattabriga; *European Journal of Cardiothoracic Surgery* 32(2007), 527-31
2. Petterson PH, Jakobsson J, Owall A. Intravenous acetaminophen reduced the use of opioids compared with oral administration after coronary artery bypass grafting. *J Cardiothorac Vasc Anesth* 2005;19(3):206-309.
3. Lantinen et al : Paracetamol as adjunctive treatment for postoperative pain after cardiac surgery; *Anaesth Analg* 2002;95;813-9
4. Muller XM et al : Pain location, distribution and intensity after cardiac surgery. *Chest* 2000;118:391-396.

5. Ranucci M, Cazzaniga A, Soro G, Isgro G, Rossi R, Pavesi M. Postoperative analgesia for early extubation after cardiac surgery. A prospective, randomized trial. *Minerva Anesthesiol* 1999;65:859-865.
6. Kanlet H Dahl; Value of multimodal / balanced analgesia in postoperative pain treatment. *Anaesth Analg* 1993;77:1048-56
7. Dahl JB et al: prevention of postoperative pain by balanced analgesia; *Br Journal of anaesthesial* 1990;64;518-20

Osteoarthritis: an update with relevance for clinical practice

Despite efforts over the past decades to develop **markers of disease**, still-imaging procedures and biochemical marker analyses need to be improved and possibly extended with more specific and sensitive methods to reliably describe disease processes.

There are three treatment modalities: non-pharmacological, pharmacological, and surgical. In many patients these modalities are combined.

Pain has many components, and is also affected by comorbidities, such as sleeping problems, loneliness, and mood disorders, improvement of mental and social wellbeing is therefore also a target in some patients.

There is evidence for a positive effect of exercise, pacing of activities, joint protection, weight reduction, and other measures to unload damaged joints (effect size 0.20-0.50). Weight reduction is not easy, but quite effective, especially in osteoarthritis of the knee.

Unpopular measures such as braces, cranes, and other forms of joint protection might have a slight effect and are generally cost effective.

Commonly used treatment modalities are insoles lasers, transcutaneous electrical nerve stimulation, ultrasound, electrotherapy, or acupuncture, but evidence is scarce, as is the effect size. However, applications of heat and ice are easy to use and quite effective.

Paracetamol is the first-choice oral analgesic for osteoarthritis because of its safety and effectiveness.

Patients sometimes use a group of symptomatic slow-acting drugs for osteoarthritis-i.e., glucosamine sulphate, chondroitin sulphate. Most published studies show that glucosamine sulphate has a beneficial effect on pain, with effect size ranging between 0.30 and 0.87, but no effect on function and controversial effects on structure modification. Whether glucosamine sulphate is effective in osteoarthritis remains undetermined. In the USA glucosamine hydrochloride has been assessed thoroughly, but **no** beneficial effect has been reported.

Intra-articular injection of long-acting glucocorticoids is an effective treatment of inflammatory flares of osteoarthritis (effect size for pain relief 0.58); the effect is greatest after 1 week, and diminishes thereafter. The effectiveness of the injection can be enhanced by complete bed rest of the treated joint for 72 h.

Hyaluronic acid has varying effectiveness when used for intra-articular injections for the treatment of osteoarthritis of the knee. Different injection regimens (up to five consecutive weekly injections) have been used.

A Cochrane review of surgical lavage and debridement in osteoarthritis of the knee showed **no** benefit in the short or long term compared with placebo; in general this procedure is **not** advised. Joint replacement is very cost effective in patients with severe symptoms or functional limitations associated with a reduced quality of life, despite conservative treatment.

JWJ Bijlsma, Francis Berenbaum, FPJG Lafeber, *The Lancet* 2011;377:2115-2121