

A COMPARISON OF SINGLE VERSUS MULTIMODEL ANALGESIA IN ABLATIVE MAXILLOFACIAL SURGICAL PROCEDURES

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ABSTRACT

Objectives of this study was to evaluate the analgesic effect of single vs multimodal analgesics in postoperative pain in ablative maxillofacial surgery and to investigate whether prophylactic treatment with multimodal nociceptive blockade will delay the onset of postoperative pain, decrease analgesic requirement, speed recovery time and facilitate early discharge in this surgical group. This experimental comparative study was conducted in Maxillofacial Operation Theatre of Nishter Institute of Dentistry, Multan during the period from August 2013 to Feb 2014 equal groups of 30 each using non probability convenience sampling technique. In Group A patients an intramuscular injection of Ketorolac 0.5mg/kg was given 45 min before induction of anaesthesia preoperatively. In group B patients intramuscular injection of 0.5mg/kg ketorolac + 2mg/kg body weight of Tramadol (IM) was given 45 min before induction of anaesthesia preoperatively + local infiltration of 0.5 % injection bupivacaine was done 10 min before giving incision. In Group A patients, 17 patients (56.6%) had mild pain, 6 patients (20%) had moderate, 5 patients (16%) had severe and 2 patients (6.66%) had no pain. While in group B who received multimodal analgesia, the degree of postoperative pain was greater than in the group A in which 15 patients (50%) had mild pain, 2 patients (6%) had moderate pain and 13 patients (43.3%) had no pain. In group B, no patient suffered from severe pain. It was concluded that multimodal analgesia showed greater advantage over single analgesia in patients undergoing ablative maxillofacial surgical procedures.

Key Words: Ketorolac, Tramadol, Bupivacaine.

INTRODUCTION

The international association for the study of pain defines pain as “an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage”.¹ Post-operative pain differs from other type of pain in that it is usually transitory with progressive improvement over relatively short time course. This renders the condition more easily amenable to therapy than is the case for chronic types of pain. The relief of pain during surgery is the actual aim.

Post operative analgesia has developed consider-

ably. A wide range of resources including antipyretics, NSAIDs and opioid agonists, antagonist allow to great variation of sensitivity between individuals.² New technique such as patient controlled analgesia (PCA) and spinal narcotic therapy are becoming essentials for intense pain.³ New concepts have appeared such as treatment units for acute pain while others are gaining momentum like prophylaxis of post operative pain. Relief of surgical pain with normal side effects is primary goal. The various drugs and techniques for their administration have varying degree of success.³ Research on ideal technique, ideal drug and ideal time of application is still going on for better results in postoperative pain management. Management of post-operative pain relievers suffering and leads to earlier mobilization, short hospital stay, reduces hospital cost and increases patient satisfaction.⁴

Acute postoperative pain relief is complex physiological reaction to tissue injury, visceral distention or disease. It is manifestation of somatic, autonomic, psychological and behavioral response that results in unpleasant unwanted sensory and emotional experience. To treat pain effectively a thorough knowledge of

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anatomy and physiology of pain and its transmission is necessary. Acute pain from surgery has three major components: tissue injury, nociceptor sensitization and activation of central pathway.³

Painful stimuli produced by a surgical incision can lead to hyperexcitable state in the spinal cord. This hyper excitable state can exacerbate postoperative pain. Once the hyper excitable state has been established, a larger dose of analgesic drug is needed than if hyper excitable state is prevented before surgery.³ If we use more than one type of analgesics e.g opioid and NSAIDs together before surgical incision, it is more efficacious.⁵

Effective pain relief after surgery is an essential element of good anesthetic management. In addition to improving patients comfort, pain relief reduces sympathetic system response and help to control postoperative hypertension and tachycardia. Commonly used drugs for postoperative pain relief are opioids and nonsteroidal anti-inflammatory drugs. The (NSAIDs) have been increasingly used. They are used as both sole analgesics or as adjunct to opioids. The combination of (NSAIDs) and opioids enhance the quality of analgesia, as the peripheral pain can be treated by using (NSAIDs) and central pain by opioids.⁵

METHODOLOGY

This experimental comparative study was conducted in Operation Theatre of Nishter Institute of Dentistry, Multan during the period from August 2013 to February 2014. Sixty patients were included in the

TABLE 1: DISTRIBUTION OF AGE AND WEIGHT

Data	Group A (X+ _S.D) (n=30)	Group B (X+ _S.D) (n=30)
Age in years	37.8±9	39.1±7
Weight in kg	53.7±3	51.9±2
Height (cms)	145cm + 16 cm	140cm ±5 cm

TABLE 2: EFFECT OF HEART RATE, BLOOD PRESSURE AND RESPIRATORY RATE AT CONCLUSION OF SURGERY

Group	A(X+ _S.D)	B(X+ _S.D)
Pulse rate	88/min±2	78/min ±6
Blood pressure	130/90 mmHg	125/85 mmHg
Respiratory rate	±112.15±5	± 107 14±6

TABLE 3: PAIN SCORES

Pain score	Mild pain		Moderate pain		Severe pain		No pain	
Group A (n=30)	17	56.6%	6	20%	5	10%	2	6.66%
Group B (n=30)	15	50%	2	6%	0	0%	13	43.3%
P value	< 0.05							

study and divided into 2 equal groups of 30 each using non probability convenience sampling technique. Group A: preoperatively at 45 minutes before induction of anaesthesia an intramuscular (IM) bolus injection of ketorolac 0.5mg/kg was given. Group B: preoperatively at 45 min before induction of anaesthesia, an intramuscular (IM) bolus injection of 0.5mg/kg ketorolac + 2mg/kg body weight of tramadol (IM) + local infiltration with 0.5% injection Bupivacaine was done 10 min before incision. Objectives of this study is to evaluate the analgesic effect of single vs multimodal analgesics in postoperative pain in ablative maxillofacial surgical procedures and to investigate whether prophylactic treatment with multimodal nociceptive blockade will delay the onset of postoperative pain, decrease analgesic requirement, speed recovery time and facilitate early discharge in this surgical population.

RESULTS

Mean pain score was noted 30 min after completion of operation using VAS and Mc Gill questionnaire. Lower pain score was noted in group B patients (ketorolac 0.5mg/kg + tramadol 2mg/kg IM + 0.5% inj bupivacaine infiltration) than in group A (ketorolac 0.5mg/kg body weight alone). Majority of patients 13(43.3%) experienced no pain, 15 patients (50%) had mild pain, and 2 patients (6%) had moderate pain. There was no case having severe postoperative pain in group B. While in Group A patients, 17 patients (56.6%) had mild pain, 6 patients (20%) had moderate, 5 patients (16%) have severe and 2 patients (6.66%) had no pain. A statistically significant difference i.e. $p < 0.05$ between mean pain scores was observed between group A and B. The time interval for first request for analgesia postoperatively after awakening from anesthesia was greater in group B than in group A ($p < 0.05$). The number of doses required was also less in group B than in group A.

Mean Arterial Pressure, Heart Rate and Respiratory Rate were also noted at the time of assessment of mean pain scores and higher values were revealed in group A than in group B ($p < 0.05$). The incidence of nausea was significantly higher in one Group A, than in Group B. Postoperative daily living function was also better in the Group B than in Group A, as indicated by questionnaire response at 48 hours.

DISCUSSION

Preemptive analgesia is currently being used for the management of postoperative pain and is no longer actively researched.^{6,7} Several investigators have proposed that preempting painful stimuli by administering a long acting analgesic such as ketorolac preoperatively could prevent or reduce postoperative pain.⁸ The choice of ketorolac for this surgical population is based on the fact that it is a non steroidal anti inflammatory drug (NSAID) that has an analgesic efficacy similar to commonly used opioids. Non narcotic NSAID is safe for postoperative pain.⁹ The mode of action of ketorolac is as a cyclooxygenase inhibitor further suggests that it should be given preoperatively to achieve optimum effect before tissue damage.¹⁰

Local anaesthesia induces antinociception by acting on the nerve membranes. However they effect many membrane associated proteins in any tissue, and can inhibit the release and action of agents e.g, prostaglandins or lysosomal enzymes that sensitize or stimulate the nociceptors and contribute to inflammation.¹¹ The choice of Bupivacaine for local anesthetic infiltration and the decision to induce blockade prior to skin incision were based on reports of improved postoperative analgesia using this approach.^{12,13}

Ionnides¹⁴ used local anaesthetics like levobupivacaine which is safe and long duration anaesthetic in laparoscopic surgery procedures. The time interval for the first request for analgesia postoperatively after awakening from anaesthesia was greater in group B, which was given local anaesthesia preoperatively, than in group A which was not given pre emptive analgesia ($p < 0.05$). The number of doses required was also less in group B than in group A.

Tramadol was chosen as asynthetic opioid and it has analgesic effect due to activation of mu opioid receptors and inhibition of monoamine reuptake specifically serotonin and norepinephrine. Several studies also concluded tramadol is effective in reducing postoperative pain.^{15,16, and 17}

Jabalameh¹⁸ in his double-blind study, carried out on 90 patients (18-65 years) of American Society Anesthesiologists physical status I and II who were candidates for a lower abdomen surgery during 2011. They were randomly assigned to receive preemptive subcutaneous Tramadol or normal saline (NS). He concluded that subcutaneous preemptive infiltration of Tramadol before surgical incision reduces post-operative opioid consumption.

Finally, the finding of reduced side effects in the present study likely derives from the administration

of doses lower than conventional postoperative doses made possible by concurrent administration of several drugs. Such effective, near complete pain relief has not been reported previously for patients undergoing ablative maxillofacial surgical procedures under similar anaesthetic conditions¹⁹. Most investigators have focused on the prophylactic benefit of only one drug. In one study, wound pain was abolished by local infiltration of Bupivacaine at the end of the procedure, but pain due to other causes was not abolished, resulting in a long duration of hospital stay.¹¹ Most of the patients premedicated with opioids prior to ablative maxillofacial surgical procedures still required narcotics in High Dependency Unit (HDU). But the present study indicated that by use of multimodal analgesics fewer patients required narcotics in the HDU. The duration of hospital stay was reported to be very short.¹²

The incidence of nausea in the HDU and in the ward was significantly higher in one Group A, than in Group B, most likely due to severe pain and greater intraoperative and postoperative opioid consumption. However, the overall incidence of postoperative nausea and vomiting for the two groups was low in contrast to previous reports of high incidence of these effects in the same surgical population. The difference between Groups may have been influenced by the presence of residual analgesic effect in the Group B, the duration of Bupivacaine infiltration usually lasted for 4 hours and the analgesic effect has been reported to last longer. These finding are also consistent with findings of other studies in which reduced side effects were noted in patients in which multimodal analgesia was given preemptively.^{19,20}

CONCLUSION

Use of multimodal analgesia (Ketorolac + Tramadol+ local anaesthetic Bupivacaine) appears to be effective, offering high quality anaesthesia with fewer side effects and resulting in faster recovery and discharge.

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