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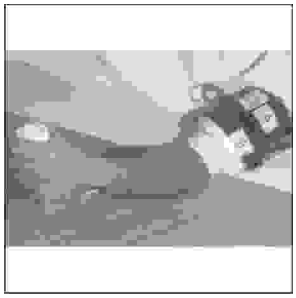
BIER'S BLOCK;

COMPARISON OF LIGNOCAINE VS LIGNOCAINE + KETOROLAC



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ABSTRACT... Objective: To compare the duration of anaesthesia and degree of analgesia during intravenous regional anaesthesia using lignocaine alone and lignocaine with ketorolac. **Design:** This international quasi experimental study **Setting:** Nishtar Hospital, Multan. **Period:** Six months (from June 2004 to November 2004). **Material and Methods**: Patients with known allergy to local anaesthesia or keteroloca and with hepatic, renal disease were not included in the study. **Results**: Mean pain score at 0,1,2,3,4,5,6 in both groups after release of tourniquet. The quality of analgesia observed in both groups showed that 20 patients in lignocaine + ketorolac group had excellent analgesia compared with only 4 patients in lignocaine group. Tourniquet pain was not experienced in any patient in both groups; owing most probably to the inflation of distal tourniquet cuff on the anaesthetized part of the arm with release of proximal tourniquet, 10 minutes after injection of solution. **Conclusion**: It is concluded that 30 mg ketorolac added to lignocaine in IVRA increases degree of anaesthesia and also provides prolonged postoperative analgesia.

Key words: Postoperative Anaesthesia, Biers Block, Lignocaine.

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in term of such damage[1]. The word "pain" is derived from the Latin word "Poena" meaning punishment. Pain like poverty is always with us. After the birth of civilization, it took man a long time to get around to doing something about alleviating pain.

The relief of pain during surgery is the aim of anaesthesia. Any expertise required in this field should be extended into the postoperative period. Acute postoperative pain can cause detrimental effects on various systems. To treat pain effectively a thorough knowledge of the anatomy and physiology of pain and its transmission is necessary[2].

Painful stimuli, like that produced by a surgical incision, can lead to a hyper excitable state in the spinal cord. This hyper excitable state can exacerbate postoperative

pain[3]. Once the hyper excitable state has been established, a larger dose of analgesic is required. If it is administered before the painful stimulus that occurs with surgical incision, postoperative pain can be greatly diminished. Epidural, intravenous, an intra-muscular opioids have been shown to reduce the severity of postoperative pain to greater extent when administered before surgical stimuli rather than following it. Intravenous regional anaesthesia is one of the techniques that have been used in this study to provide anaesthesia and postoperative analgesia in short procedures of upper arm surgery.

Effective pain relief after surgery is an essential element of good anaesthetic management. A wide range of drugs including NSAIDs, morphine, opioid agonists and antagonist have been used, new technique such as patient control analgesia (PCA) and spinal opioids are becoming essential for intense pain. New concepts have appeared such as treatment units of acute pain while others are gaining new momentum like pre-emptive use of drugs for postoperative pain.

Relief of surgical pain with minimal side effects is the primary goal. The various drugs and techniques of their administration have varying degree of success. The conventional use of intermittent intramuscular injection of opioid is least ideal in most circumstances[4].

Intra-venous injection of opioid provides less fluctuation in the quality of analgesia, but they require the use of more sophisticated infusion devices and experienced personnel for optimal results. Extra dural analgesia using local anaesthetics or opioids may be used but may be associated with hypotension and delayed respiratory depression. In IVRA all these systemic side effect of drugs can be avoided.

After being neglected for a long time, postoperative analgesia is developing considerably[5]. In addition to improving patient comfort, pain relief reduces sympathetic system response and helps to control postoperative hypertension and tachycardia in susceptible patients.

PURPOSE OF STUDY

To compare the duration of anaesthesia and degree of analgesia during intravenous regional anaesthesia using lignocaine alone and lignocaine with ketorolac.

MATERIAL AND METHODS

This international quasi experimental study was carried out in Nishtar Hospital, Multan for the period from June 2004 to November 2004. Patients with known allergy to local anaesthesia or keteroloca and with hepatic, renal disease were not included in the study. Patients were divided in two groups comprising of 30 patients in each group, using non-probability sampling technique.

INCLUSION CRITERIA

* Patients belonging to ASA status-I and II.
* Patients belonging to age between 30-40 years.
* Weight 60-80 kg.
* Patients scheduled for minor hand surgery and short orthopaedic procedure of the forearm.

EXCLUSION CRITERIA

1. Patients with known allergy to LA or ketorolac.
2. Patients with hepatic dysfunction.
3. Patients with sickle cell disease.
4. Any known convulsive disorder.
5. Deficient peripheral disorder of circulation.
6. Myasthenia gravis.
7. De-compensated heart disease.

RESULTS

Mean pain score at 0,1,2,3,4,5,6 in both groups after release of tourniquet is shown in (Table-I). The quality of analgesia observed in both groups showed that 20 patients in lignocaine + ketorolac group had excellent analgesia compared with only 4 patients in lignocaine group (Table-II).

Tourniquet pain was not experienced in any patient in both groups; owing most probably to the inflation of distal tourniquet cuff on the anaesthetized part of the arm with release of proximal tourniquet, 10 minutes after injection of solution (Table-III).

Table-I. Mean pain score at 0,1,2,3,4,5,6 in both groups after release of tourniquet		
Quality	**Group A n = 30**	**Group B n = 30**
Excellent	2.28±0.75	1.29±0.35
1	2.83±1.12	1.57±0.68
2	3.21±1.05	1.75±0.56
3	3.35±0.85	1.95±0.73
4	4.15±0.86	1.95±0.82
5	4.50±0.67	1.96±0.85
6	4.85±0.50	2.00±1.15

Table-II. Quality of Analgesia		
Quality	**Group A n = 30**	**Group B n = 30**
Excellent	08	20
Good	02	04
Fair	06	06
Poor	14	-
Total	30	30

Table-III. Incidence of Tourniquet Pain	
	Tourniquet Pain
Group A Lignocaine (n = 30)	NIL
Group B Lignocaine + Ketorolac(n = 30)	NIL

DISCUSSION

Intravenous regional anaesthesia is widely used in forearm and hand surgery. The draw back with this technique is the absence of postoperative anaesthesia[1]. In several studies it was tried to find a local anaesthesia mixture that allows prolonged duration of analgesia after tourniquet release. In this context non-steroidal anti-inflammatory drugs. Opioids and combination of opioid and muscle relaxant have been used[2]. Clinical use of opioid analgesics is based on the principle of their dose response relationship. The relation between the dose of NSAID and its analgesic effectiveness is less well established, although a similar concept probably applies. Thus administration of ketorolac to an isolated extremity would be expected to produce more intense analgesia in that extremities than would occur when the same dose was given systemically. In present study combination of lignocaine 0.5% and ketorolac 30 mg has been used and compared the degree of anaesthesia and duration of postoperative analgesia while using lignocaine alone in the other group.

During IVRA the hand and forearm are isolated from the rest of body. Some leakage of drug, into the general circulation can occur when injected distal to tourniquet. However, steps were taken to minimize this. The principle site of anaesthesia in IVRA is debated[6]. Tourniquet ischaemia alone will produce anaesthesia[3] but at a considerable slow rate than in combination with local anaesthetic agent. Local anaesthetic agents probably act at two sites, anaesthesing both large sheathed nerves at the elbow and also affecting small unsheathed nerve peripherally[7]. The administration of ketorolac locally decrease the incidence of systemic side effects while providing the analgesic benefits suggested by Lundell et al[8].

Ruban et al used mepridine in IVRA. They used 75 mg of mepridine, but even this large dose failed to block conduction in median nerve[9]. Also large dose lead to a more frequent incidence of side effects without significant prolongation of postoperative analgesia. With mepridine, there were unexpected adverse clinical effects such as severe skin vasodilatation, associated with severe pruritis[10]. With this large dose postoperative analgesia lasts approximately 5 hours, but Teinbage et al studied that addition of ketorolac 30 mg to local anaesthesia in IVRA provides effective postoperative analgesia without side effects for 10 hours[8]. In our study also postoperative analgesia lasted for more than 10 hours with ketorolac and lignocaine than lignocaine alone[3]. Mean duration in lignocaine + ketorolac group was 585.13±227.54 minutes whereas in lignocaine group it was 113.03±8.65 minutes. Also mean VAS was better in lignocaine±ketotolac than in lignocaine alone (1.57±0.65 versus 2.83±1.12).

In another study abdulla and Fadhil obtained successful

analgesia in 100% of cases with combination of lignocaine (100 mg)+Fentanyl (50 mg) and Pancuronium (0.5 mg). Although they obtained better loss of power with pancuronium, however, no improvement in postoperative analgesia was found with the addition of fantanyl[11]. In another study done by Ruben et al in which they used non-steroid anti-inflammatory drug ketorolac, has been reported to improve regional anaesthesia both in terms of dosage and postoperative analgesia[12].

Ketorolac provides effective postoperative analgesia when added to lignocaine as component of IVRA for ambulatory hand surgery[12]. The doses used in this study are equivalent to those administered systemically. These systemic doses of ketorolac have been associated with severe systemic side effects, limiting clinical utility of systemic ketorolac. The administration of ketotolac locally could possibly decrease the incidence of side effects while providing analgesic benefits[7]. It is unclear whether the analgesia observed represent pharmacological action of ketorolac at the site of surgery or a pre-emptive analgesic effect[6]. Systemic effect of ketorolac are unlikely to have contributed to the prolonged analgesia we observed, because ketorolac has systemic half life of 4-6 hours as compared with duration of analgesia which exceeded 10 hours in our study. The persistence of ketorolac in peripheral tissue when administred as a component of IVRA is not known[13].

Most adverse events associated with the use of systemic ketorolac in the context of either large doses or prolonged used. However, limiting the administration of ketorolac to the region of surgical procedure produces a local ketorolac concentration much higher than that after systemic administration and thus avoiding the systemic adverse affects.

CONCLUSION

It was found that the duration of analgesia and degree of block, both were better in patients with ketorolac + lignocaine than in patients with lignocaine alone and no systemic side effects of local anaesthesia or ketorolac were noted in any of the patients after the tourniquet release. It is also concluded that 30 mg ketotolac added to lignocaine in IVRA increases degree of anaesthesia and also provides prolonged postoperative analgesia.

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