ORIGINAL ARTICLE

ROLE OF PREEMPTIVE ANALGESIA IN LAPAROSCOPIC CHOLECYSTECTOMY

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ABSTRACT

Objective — *To compare the effect of preemptive analgesia with post operative analgesia using diclofenac sodium in female patients undergoing laparoscopic cholecystectomy.*

Study design — *Descriptive study*

Place & Duration of study — *Study was conducted in surgical ward 3, Jinnah Postgraduate Medical Center Karachi from January 2007 to December 2008.*

Patients and Methods — *This study was carried out on two hundred patients, divided into 2 comparable groups. Group I. included 100 patients in whom post operatively injection diclofenac sodium was given without any preemptive analgesia. In group II, of 100 patients diclofenac sodium 100 mg suppository was given after induction. Same anesthesia drugs were given to all the patients. Verbal rating scale was explained to patients during pre-anesthesia consultation. Post operatively pain was assessed by verbal scale and results were recorded and comparison done between two groups.*

Results — *Most of the patients in group I experienced moderate pain (n 80) and severe pain (n 20) and requirement for analgesic drugs was also more in this group. In group II diclofenac sodium suppositories were used for preemptive analgesia. Post operatively most of the patients experienced no pain to mild pain (n 90), and post operative analgesic requirement was also less.*

Conclusions — *Preemptive analgesia in female patients who underwent laparoscopic cholecystectomy with diclofenac sodium was effective in blocking noxious stimuli and central sensitization, with subsequent prevention of acute post operative pain.*

Key words — *Preemptive analgesia, Laparoscopic cholecystectomy, NSAIDs.*

INTRODUCTION:

Preemptive analgesia given before noxious stimulation, prevents or reduces subsequent pain. Pain associated with central sensitization is called pathological pain. Preemptive analgesia could be defined as analgesia that prevents the development of pathological pain.[1] Surgery offers the most promising setting for preemptive analgesia because the timing of noxious stimuli is known.[2]

Both the peripheral and the central nervous systems (CNS) are involved in the perception of pain, with the spinal and supraspinal components of the CNS playing key roles.[3] The transduction of noxious stimuli begins with peripheral nociceptors. Signals from

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these nociceptors travel primarily along small myelinated A and unmyelinated C fibers with some lying in the dorsal root ganglion.[4] The signals then travel along the spinothalamic tract of the spinal cord to the thalamus and the cortex. Painful stimuli ultimately cause activity in both the somatotopically appropriate portion of the sensory cortex and the limbic system. The process through which the neurons of the dorsal horn of the spinal cord become sensitized by prior noxious stimuli is often referred to as "windup" or "central sensitization"[5] Preemptive analgesia thus prevents the onset of noxious stimulus to prevent central sensitization. Therefore, the concept of preemptive analgesia may have implications in reducing not only acute post operative pain but also the chronic pain.[6]

The objective of study was to compare the effect of preemptive analgesia with post operative analgesia using same the drug in female patients.

PATIENTS AND METHODS:

This study was conducted in the Department of Surgery ward 3 at Jinnah Postgraduate Medical Center Karachi, from January 2007 to December 2008. It was a descriptive study and carried out on two hundred patients, divided into 2 groups. Group I included 100 patients in whom post operatively injection diclofenac sodium 75mg was given through intramuscular route without any preemptive analgesia. Group II included 100 patients in whom diclofenac sodium 100 mg suppository was given per rectaly immediately after induction. Anesthetist standardized the anesthesia by using propofol, atracurium and isoflurane.

Verbal rating scale was explained to the patients during pre-anesthesia consultation. In this scale patient rates the pain verbally as no pain, mild pain, moderate pain, or severe pain. Verbal scale was recorded for 24 hours and pain was assessed at 0, 4,8,12 and 24 hours after the surgery. The consumption of diclofenac sodium was also recorded.

All female patients with chronic cholecystitis of 30-50 years of age scheduled for laparoscopic cholecystectomy were included. Patients with ASA-I physical status were eligible. Those patients who had any history of allergy to NSAIDS or severe hepatic, renal or coagulation disorders were excluded. Patients in whom complications of laparoscopic cholecystectomy occurred during surgery were also excluded.

RESULTS:

Most of the patients in group I experienced moderate pain (n 80) and severe pain (n 20) and requirement for analgesic drugs was also more in this group. In group II diclofenac sodium suppositories were used for preemptive analgesia. Post operatively most of the patients experienced no pain to mild pain (n 90), and post operative analgesic requirement was also less (table I).

DISCUSSION:

Preemptive analgesia strategies include interventions at one or more sites along the pain pathway.[8] These strategies are subarachnoid block,[9] local anesthetics,[10] nerve block,[11] epidural block,[12] intravenous analgesics and anti-inflammatory drugs.[13] Infiltration of the incision site with the long-acting local anesthetic bupivacaine after administering general anesthesia and before incision was found to be more effective for hernia repair pain than either spinal anesthesia or general anesthesia alone and these benefits appeared to last many days. Anti-inflammatory drugs may play an important role in preoperative pain management by reducing the inflammatory response in the periphery and thereby decreasing sensitization of the peripheral nociceptors. This should help attenuate central sensitization.

Table I: Post operative verbal pain rating

	Group 1 (No Preemptive analgesia)		Group II (Preemptive analgesia)	
	No. of Patients	%	No. of Patients	%
No pain	00	00	15	15
Mild pain	00	00	75	75
Moderate pain	80	80	8	8
Severe pain	20	20	2	2

Pain not only effect surgical outcome but also results in the development of chronic pain. The results of a clinical study of preemptive analgesia were mostly disappointing.[14] In other study done the authors have observed that preemptive use of analgesia in no instance resulted in better postoperative pain relief.[15]

We used diclofenac sodium suppositories which proved to be very effective and simple method with no side effects as compared to other studies. Other studies done in Glostrub university hospital indicated that preemptive analgesia is very effective but further studies are needed to investigate the analgesic effect of prolonged multi model combination of different classes of analgesics and antipyretics on post operative pain.[16] A study conducted in France showed that pre operative administration of ketoprofen improves post operative analgesia after laparoscopic cholecystectomy compared with post operative administration.[17]

Above literature review showed that preepmtive analgesia is controversial but there are so many factors which affect the pain. Threshold is variable from person to person even in same patient on different occasions. It is highly variable depending on psychological variables including cultural factors, past experiences and meaning of pain for an individual. Pain effects respiratory system and can cause atelectasis, pneumonia due to reduced ability of cough and can cause deep vein thrombosis. Myocardial infarction due to immobilization and increased sympathetic out put may result .

Post operative effect of anesthetic drugs on operative pain is controversial so we standardized anesthesia by using same drugs by anesthesia team. We also included same age patients in both the group because in different age groups tolerance may be different. For pain assessment we used simple verbal rating scale which patients can easily understand instead of visual analog score which is complicated. Perhaps due to these reasons our study results are different.

Timing of analgesia seems to play a major role in reduction of post operative pain score and probably preventing the development of chronic pain syndrome.[18] We used only suppositories 20 minutes before incision was made. It had maximum concentration of drug during surgery to prevent noxious stimulus to travel. Pain can be blocked at various levels. NASID can reduce peripheral inflammatory response by reducing prostaglandin production. Epidural anesthesia blocks spinal nerve root. Opioids can produce analgesia by binding to opioid receptors in spinal cord. So administration of appropriate combination and concentration of different analgesics and their extension into post operative period is very effective.[19] In pain control after laparoscopic cholecystectomy, sub hepatic administration of bupivacaine immediately after the creation of pneumoperitoneum has been shown to be more effective than administration before the withdrawal of the trocars.[20]

CONCLUSIONS:

Preemptive analgesia in laparoscopic cholecystectomy by using diclofenac was very effective by preventing noxious stimuli to prevent central sensitization and subsequently preventing acute pain. No side effects of diclofenac were observed in this study.

LIMITATIONS OF THE STUDY:

This was not a randomized controlled trial and results are not supported by statistical analysis. It did not includ male patients and the use of analgesia was limited to laparoscopic cholecystectomy. The results thus can not be generalized. A scientifically conducted randomized controlled trial is thus needed to prove the usefulness of preemptive analgesia.

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