

## Acupuncture - A Preemptive Analgesic Technique

S.Parthasarathy, M.Ravishankar

### ABSTRACT

**Background:** Preemptive technique is administration of analgesics before the advent of noxious stimulus. Acupuncture is a technique of insertion of small gauge needles at selected points to produce analgesia and sedation. In our study, we tried to use acupuncture as a preemptive technique.

**Patients & Methods:** Fifty patients admitted to our hospital were randomly divided into two groups of twenty five each. All patients underwent inguinal herniorrhaphy under intrathecal lignocaine. Patients of Group "A" received preemptive acupuncture treatment while Group "C" did not receive any. Intra operative sedation, postoperative pain scores, post operative sedation, analgesic requirement and any untoward side effect were observed by a blinded observer.

**Results:** The intra operative sedation was significantly more while the post operative pain scores and analgesic requirements were significantly less in Group "A". There was no significant side effect in any patient belonging to either group

**Conclusions:** Preemptive acupuncture technique can be safely and effectively used as a post operative analgesic technique.

**KEY WORDS:** Acupuncture, Preemptive Analgesia, Postoperative Pain.

Acupuncture is an ancient system of medicine with universal acceptance. It is basically insertion of needles at described points to get clinical benefits. Analgesia is one of the major actions of acupuncture and the mechanisms by which it is effected are varied. Preemptive technique is administration of analgesics before the advent of noxious stimulus. This technique is known to be an effective postoperative method of analgesia. Hence a prospective randomized observer blinded study was conducted to evaluate the efficiency of preemptive acupuncture on postoperative pain relief.

### PATIENTS AND METHODS

After approval from the hospital ethics committee and informed consent, fifty patients of ASA grade I and II scheduled for inguinal herniorrhaphy under spinal anaesthesia were enrolled for the study. Patients with spinal abnormalities, neuropathies and coagulation problems were excluded. All patients received Inj. diazepam 0.2mg kg<sup>-1</sup> and Inj. atropine 0.6mg intramuscular (IM) 45 minutes before anaesthesia. Then they were randomly divided into two groups, Group A (Acupuncture) and Group C (Control) by a sealed envelope technique. Twenty minutes after premedication, patients of Group 'A' received insertion of acupuncture needles at the following sedative and analgesic points (Du20, Li4, St44, Sp6). The insertion of needles in limb points was bilateral. (Fig 1) (Tsun = body inch = approximate width of thumb)

1. **Li4: Hegu:** bulge of the first dorsal interosseous muscle when thumb is kept in adduction. Action: powerful analgesia.
2. **Du 20: Bahui:** on the scalp in the midline midway between the line connecting both auricles. Action: Powerful sedation and tranquility.
3. **St 44: Neiting :** On the dorsal aspect of the foot just (0.5 Tsun) proximal to the web space between the second and third toes. Action: analgesia.
4. **Sp 6: Sanyinjiao:** 3 tsun proximal to tip of medial malleolus. Action: General tonification, treatment of genital diseases and analgesia.

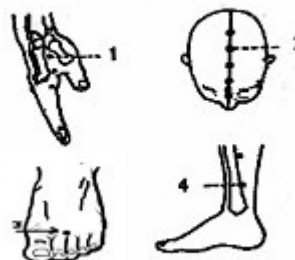


Figure 1

Showing used acupuncture points.

These points were distal from the site of incision. Electrical stimulation was not used in any of these points. All patients of Group A were informed that needles were inserted to facilitate spinal anaesthesia to eliminate the

Drs. S.Parthasarathy, M.Ravishankar, Professor of Anaesthesiology, Mahatma Gandhi Medical College and Research Institute. Pondicherry. India

Correspondence : Dr.S.Parthasarathy, Email : [painfreepartha@yahoo.com](mailto:painfreepartha@yahoo.com)

suggestion effect on post operative pain. Twenty minutes later, patients of both groups were given 1.5 ml of hyperbaric 5% lignocaine. Patients of Group C received no needles. The surgery lasted around twenty minutes and was uneventful in all cases. The intraoperative sedation scores were noted by a blinded observer as follows: 1. Deeply sedated responding to pain. 2. Asleep, responds to touch. 3. Asleep, responds to oral commands. 4. Awake and comfortable. 5. Awake and anxious.

The spinal level was adequate in all cases and no patient received additional intraoperative sedatives. The needles were removed after surgery so that the total duration of needles was restricted to one hour. The post operative pain scores were studied by a blinded staff nurse as a 0-10 eleven point Numerical Rating scale (NRS). The post operative sedation scores was also monitored. The regression of spinal level below the incision site was taken as "0" hours. All the patients were shifted to the postoperative ward and the regression was noted by the blinded staff nurse. The pain and the sedation scores, pulse, blood pressure, respiratory rate were monitored and entered in a proforma every three hours for a study period of twelve hours. Inj. Pentazocine in 6 mg IV increments was used when the patient complained of pain or the NRS is = 6. If the pentazocine requirements exceeded 30 mg within a three hour period, a rescue analgesic in the form of Inj. Ketorolac 30 mg IM was used. All data were entered in a proforma, fed into the computer for SPSS and subjected to statistical analysis. Student's 't' test and  $\chi^2$  analysis were performed in appropriate situations and a 'p' value of less than 0.05 was taken as significant.

**RESULTS**

There was no significant difference between the groups with respect to age and weight. Table 1.

**Table 1**  
Showing Mean and Std. Dev. of both groups

	Group A	Group C
AGE (years)	39.2 ± 13.91	36.2±13.17
WEIGHT (Kg)	56.6 ± 4.31	56.88 ± 4.37

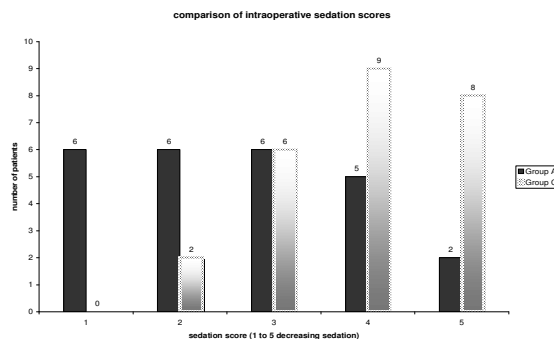
The percentage of patients who required additional rescue analgesic in the form of Inj. IM ketorolac was significantly less in Group A (16.6%) than Group C (73.3%) The pain scores were similar in both the groups except at 0 hours when the scores were significantly high in Group C. (fig 2 & 3)

The mean and SD of the pentazocine requirements were 38.64 ± 8.4 mg. in Group A while it was 50.4 ± 10.6 mg. in Group C during the study period. Nine patients of Group A and 23 patients of Group C received the first

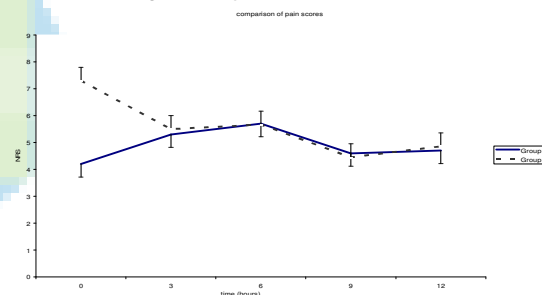
**Table 2**  
Showing greater sedation in Group A patients

Sedation score	Group A	Group C
1 ( ↑ sedation)	6	0
2	6	2
3	6	6
4	5	9
5 ( ↓ sedation)	2	8

The intraoperative sedation was significantly more pronounced in Group A. Table 2 and fig 2



**Figure 2**  
Showing intraoperative sedation scores



**Figure 3**  
Showing comparable pain scores (Mean ± SD)

narcotic dose at "0" hours. It clearly establishes the necessity of analgesic administration for Group C at "0" hours. It also explains the higher pain scores of Group C at 0 hours which get equalized with progression of time. With regard to the requirement of rescue analgesic, 22 patients of Group C while only 5 patients of Group "A" needed ketorolac. The postoperative sedation scores were similar in both groups. There were no untoward side effects in either group.

**DISCUSSION**

Preemptive analgesia<sup>1</sup> is an antinociceptive treatment that prevents establishment of altered processing of afferent input, which amplifies postoperative pain. The concept of preemptive analgesia was formulated by Crile<sup>2</sup> on the basis of a few clinical observations. The pharmacological modalities available may modify the physiological responses at various levels of the pain pathways. Effective preemptive analgesic

techniques<sup>3-5</sup> require multi-modal interception of nociceptive input, increasing threshold for nociception, and blocking or decreasing nociceptor receptor activation. Although the literature is controversial regarding the effectiveness of preemptive analgesia, some general recommendations can be helpful in guiding clinical care. Regional anesthesia induced prior to surgical trauma and continued well into the postoperative period is effective in attenuating peripheral and central sensitization. Pharmacologic agents such as NSAIDs (non-steroidal anti-inflammatory drugs), opioids<sup>6</sup>, and NMDA (N-methyl-D-aspartate) and  $\alpha$ -2-receptor antagonists, especially when used in combination, act synergistically to decrease postoperative pain. Considering acupuncture, there are many theories as to how acupuncture has its analgesic effects. One theory of acupuncture analgesia suggests that it generates its analgesic effects through afferent sensory stimulation. According to theories in pain, stimulation of large A-Beta fibers which mainly carry touch sensation will inhibit transmission of small A- delta and C fibers which have been found to transmit pain.<sup>7</sup> There is also a suggestion that acupuncture analgesia is caused through endogenous opioids that are released from the anterior pituitary such as beta-endorphin. Beta-endorphin has been found to bind to analgesic receptors in the dorsal horn of the spinal cord causing pain inhibition. Additionally, acupuncture's analgesic effects have found to be diminished by administration of naloxone<sup>8</sup>, a pharmaceutical substance that blocks the effects of beta-endorphin in the spinal cord. Another theory of analgesia mediated through acupuncture suggests that Meridians that are full of energy are closely related to the gap junctions of neurons.<sup>7</sup> It is thought that these synapses that connect neurons are the places of highest energy in the nervous system and thus the place where acupuncture meridians must lie. This suggestion links acupuncture to pharmacology. Many drugs, including psychotropic and pain relievers have their effects at the synapses of neurons on mono aminergic re-uptake mechanism. This theory would suggest that acupuncture works on the nervous system by a similar mechanism to create analgesia. In our study we used preemptive acupuncture and found it to provide higher intraoperative sedation and significant postoperative analgesia. Gupta, S<sup>9</sup> et al in their study on knee arthroscopies found no evidence of preemptive effect of acupuncture in their patients. There are many studies<sup>10, 11</sup> which observed the use of acupuncture as preemptive analgesic. Many studies suggesting the effects of acupuncture on postoperative pain are inconclusive and are dependent on the timing of the intervention and the patient's level of consciousness.<sup>12</sup> As we used the needles twenty minutes before anaesthesia, we were able to get necessary sedation and possible release of endorphins better than the accepted previous studies.

Hence we think that allowing adequate time after insertion of needles before any anaesthetic technique may be a possible reason for our patients getting pain relief with acupuncture.

## CONCLUSION

To conclude, acupuncture could be used as preemptive technique & it produces effective sedation and postoperative pain relief. Sufficient time should be allowed after insertion of acupuncture needles to initiate sedation and analgesia.

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