

The Effect of Acupuncture on Relieving Pain after Inguinal Surgeries

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Background:

Postoperative pain is one of the most prevalent and bothersome issues found in the surgical department. Nowadays, there are various methods of acupuncture used for relieving pain without the complications found in some routine postoperative analgesics. These methods could be especially useful for high risk patients prone to complications from analgesics, such as transplantation recipients. The aim of this study was to evaluate the efficacy of electro-acupuncture on postoperative pain control after inguinal surgeries.

Methods:

Ninety male patients, who were referred to our department with indications of inguinal surgery, were included in the study and randomly divided into two groups, such as acupuncture and control. We used electro-acupuncture for the acupuncture group and no actual acupuncture (but placed needle electrodes similar to the acupuncture group) for the control group. Postoperative pain was quantified by a blind observer in both groups using a visual analogue scale (VAS) standard score before being compared.

Results:

Pain intensity and analgesic use were significantly higher in the control group ($P < 0.05$). In the acupuncture group, the VAS pain scores were significantly lower than the control group at 0.5, 1 and 2 hours post operation. When the opioid related side effects were compared for each group, the results showed that the number of subjects who experienced dizziness in the acupuncture group was significantly lower than the control group ($P < 0.05$).

Conclusions:

Acupuncture in patients, after inguinal surgery, can reduce the need of analgesics, which also directly reduces the complications that may occur when analgesics are used in relieving pain postoperatively. (Korean J Pain 2013; 26: 46-50)

Key Words:

analgesics, electro-acupuncture, inguinal surgery, postoperative pain.

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INTRODUCTION

Pain is an important symptom that is encountered in all fields of medicine, especially in surgical wards. The International Association for the Study of Pain has proposed the following working definition: pain is ‘an unpleasant sensory and emotional experience associated with either actual or potential tissue damage, or is described in terms of such damage [1].’ Pain is a complex experience that results from physiological, sensory, affective, cognitive, and behavioral factors. Thus, an individual’s perception of pain intensity relates to the interactions of physical, psychological, cultural, and spiritual factors [2]. Therefore, for the same type of operation, the degree of pain experienced by the patient varies from person to person [3].

Approximately 70% of patients who have undergone a surgical procedure experience a certain degree (moderate, severe or extreme) of postoperative pain (POP) [4]. POP is usually underestimated and undertreated [1,4]. POP is one of the most prevalent problems that occur after surgery, which can result in increased morbidity and mortality (mostly due to respiratory and thromboembolic complications), increased hospital stay, impaired quality of life, and the development of chronic pain [5]. Pain can cause patients to feel uncomfortable resulting in sleeplessness or agitation. In addition, pain also stimulates the sympathetic nervous system, which causes an increase in heart rate, blood pressure, sweat production, endocrine hyper-function, and delays in the patient’s recovery from surgery [6].

Preoperative assessments and preparation of the patient can allow for a more effective pain management regimen. Adequate POP assessments can lead to a more effective management of pain control and fewer postoperative complications. Now, most forms of pain are treated with opioids or nonsteroidal analgesic drugs, but in the face of high complications associated with these methods, especially in some groups of patients affected by co-morbidities, researchers are evaluating various new methods of analgesia, such as acupuncture [7].

Acupuncture is one of the oldest analgesic approaches available, with a history that dates back 3000 years in China. In 1980, WHO announced 43 types of different diseases that could be treated with acupuncture without any significant side effects [6]. At the present, acupuncture analgesia and acupuncture pain relief are highly emphasized by international medical researchers [8,9]. There-

fore, the aim of this study was to find the effects of acupuncture in alleviating postoperative pain.

MATERIALS AND METHODS

This was a prospective, randomized, double-blinded, placebo-controlled study, performed at Mashhad University of Medical Science. We studied 90 patients who had undergone inguinal surgeries during a time period of three years (from 2007 to 2010). Patients with a history of inguinal surgery, opium addiction, or interfering neurological diseases were excluded from this study. The patients were divided into two equal groups, one receiving true electro-acupuncture (EA) (the acupuncture group) and the other without receiving any true acupuncture (the control group). Before the operation, the subjects’ age, weight, and medical history were all carefully recorded. The anesthesia technique was the same for all the patients of both groups, which was general anesthesia using fentanyl 2 µg/kg, sodium thiopental 5 mg/kg, atracurium 0.5 mg/kg, and the maintenance of propofol 100 µg/kg/min.

We used the SDZ V Nerve and Muscle Stimulator (Service4all, Saudi Arabia) with needles inserted through local pain control points (LI4 and SD36) and nearby the incision (total of 4 needles, 2 on each side of the incision) for both groups. The needles were inserted 1.0–1.5 cm deep, perpendicularly into the skin and were then attached to the device and started. The impulses were in the form of intermittent waves with an intensity of 2 HTZ and 2–5 mA. EA was applied through these electrodes, 30 minutes before the operation, and also 1 and 2 hours after the surgery (20 minute durations for each time). In the control group, there was no electrical excitement through the needles. The score for pain sensation was recorded by a blind observer for all of the patients using the VAS standard score with a number from 1 to 10 after the surgery at definite intervals (0.5, 1, 2, and 6 hours) and also if the pain was so severe that a request for analgesic drugs was made. We prescribed pethidine 1 mg/kg/dose intravenously on demand (in the form of PCA) for pain relief. The time of analgesic prescription was also recorded after the operation. All the data collected were taken into account for future recordings and evaluated with the SPSS program at the end of the study.

In the recovery room, the data collected dealt with first time requests of analgesics, the vital signs (such as blood

Table 1. The Prevalence of Analgesic Use, Required in Each Group

	Analgesics drugs not required	Analgesic drugs required	Total
Acupuncture group	23 (51.1)*	22 (48.9)*	45 (100)
Control group	11 (24.4)	34 (75.6)	45 (100)
Total	34 (37.8)	56 (63.3)	90 (100)

Data are number of cases (percentage). * $P < 0.05$ compared with control group.

pressure, heart rates, and blood oxygen level), and the VAS score. In the ward, the dosage and the frequency of opium demand were also recorded. The opioid related side effects, such as nausea, vomiting, dizziness, and pruritus, were also documented in both groups at regular intervals. All the data was collected by another well trained doctor double blindly.

The assessment and analysis of the data was performed with Mann Whitney and t-tests for quantitative variables, and with the Chi-square and Fisher's exact tests for qualitative variables.

RESULTS

The data of the two experimental groups were analyzed and compared with each other. The demographic data showed no statistically significant differences in age, body weight, and the duration of operation. All the patients were male. The mean age of the patients was 25.0 ± 5.0 years old (oldest was 55 and youngest was 12). The anesthesia technique was the same for all patients in both groups.

The subjects' first time requests for the analgesic drug, morphine, were recorded in the post analgesia room. The results showed that the extract acupuncture group (37 ± 6 minutes) first requested morphine after reversing anesthesia significantly later, when compared with the control group (29 ± 3 minutes).

In addition, the number of morphine requests among the two groups was compared within the first 6 hours after the operation. The results showed that during the whole of this interval, the demands for morphine of the acupuncture group were less frequent than the control group, which reached a statistical significance (Table 1). The dosage of patient controlled analgesia (PCA) morphine was also compared within 6 hours. The dosage of the acupuncture group (6.3 ± 1.3 mg) was significantly lower than that of the control group (8.2 ± 2.0 mg).

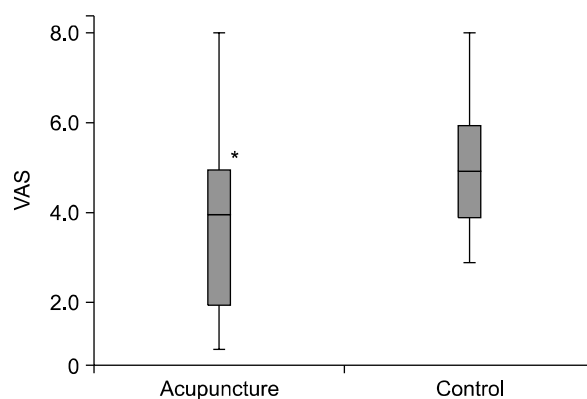


Fig. 1. Comparison of the mean VAS score between the groups of the study. The VAS score was significantly lower in the acupuncture group than the control group. The boxes are interquartile ranges; thick lines are medians and error bars are 10th and 90th percentiles. * $P < 0.05$ compared with the control group.

The mean values of pain in the VAS system were significantly lower in the acupuncture group than the control group, at 0.5, 1, 2, and 6 hours postoperatively (Fig. 1), with the P values as ($P = 0.023$), ($P = 0.031$), ($P = 0.017$), and ($P = 0.011$), respectively.

When opioid related side effects were compared, the results showed that the number of subjects with dizziness and nausea in the acupuncture group was significantly lower than the control group.

DISCUSSION

Postoperative pain is defined as an expected, inevitable symptom associated in surgical patients with surgical tissue damage, the presence of drains and tubes, postoperative complications, or a combination of the above [1,2].

Pain is a complex experience resulting from physiological, sensory, affective, cognitive, and behavioral factors. Thus, an individual's perception of the intensity of pain re-

lates to the interactions of their physical, psychological, cultural and spiritual factors [2].

Pain perception can be affected by many factors, such as age, personality, sex, education, society status, patient's knowledge, degree of the understanding about the operation, level of discomfort, level of the medical staff's attitude and care, posture of movement, time, and physical condition, thus pain is a very subjective phenomenon that changes from one person to another [3].

In general, the worst postoperative pain was experienced in thorax or upper abdominal operations followed by lower abdominal operations, whereas superficial operations have the less pain reported [5,6].

The aims of effective postoperative pain management are: 1- to improve the comfort and satisfaction of the patient, 2- to facilitate recovery and functional ability, 3- to reduce morbidity, 4- to promote rapid discharge from the hospital [6]. As a result, postoperative pain should be treated adequately in order to avoid post-operative complications and the development of chronic pain [2].

In a study, it has been concluded that preoperative EA leads to a reduction in intraoperative alfentanil consumption, though this effect may not be specific, while having a morphine sparing effect during the early postoperative period [10]. In a study by Wang et al., they concluded that high transcutaneous acupoint electrical stimulation produced a significant decrease in the PCA opioid requirement and the opioid related side effects after low intra-abdominal surgery [5].

Others showed that at least some acupuncture techniques provided substantial postoperative analgesia and significantly reduced the opioid requirement. They found that preoperative insertion of intradermal needles reduced post-operative pain, the analgesic requirement, and opioid-related side effects after both upper and lower abdominal surgery. Acupuncture analgesia also reduces the activation of the sympathoadrenal system that normally accompanies surgery [11].

In another study, it was found that EA cannot be generally recommended as a pain-relieving method at oocyte aspiration, but may be an alternative for women desiring a non-pharmacological method. An advantage of EA is that less postoperative tiredness and confusion is experienced when compared with conventional analgesia [12].

Many studies have shown that age affects the sensation of pain. Therefore, in many PCA studies, to compare

the effective dosage of morphine given to people older than 55 years, the effective dosage of morphine given to people less than 55 years old was doubled [9]. However, in this research, the differences in age, height, and body weight for the 90 subjects were not large, and these effects were not considered in this experiment. In addition, the duration of analgesic and the time of operation also had no significant differences.

In this study, the results showed that the acupuncture group had a delayed request for first time analgesic. This meant that acupuncture and electro-acupuncture can effectively delay the pain similar to opioid drugs. When the PCA demands were compared among these groups, the results showed that the subjects in the control group were more demanding of pain relief than the acupuncture group.

Furthermore, the total dose of morphine used in the acupuncture group was significantly lower than the control group at all stages. Also, the total dose of PCA used for the acupuncture group was significantly less than that of the control group. These results indicated that electro-acupuncture can reduce postoperative pain.

In addition, when comparing the results of PCA demands, the acupuncture group's demand was significantly lower than the control group at all stages. This proved that the control group had a more desperate need for analgesics than the acupuncture group.

The results for the opioid related side effects displayed that the subjects in the acupuncture group had less dizziness when compared to the other subjects of the control group, which had a statistical significance. This result could be due to the dosages of morphine applied in the acupuncture group, which were significantly lower than those administered in the control group [7].

Our results showed that electro-acupuncture alone had analgesic effects. Electro-acupuncture in patients who have undergone inguinal surgery can reduce the need for analgesics, and therefore, its complications in relieving pain postoperatively.

In future studies, different acupoints can be applied in different types of operations, so as to find the best points for electro-acupuncture. More studies may be required to investigate the changes of the physical mechanism when acupuncture is applied as an analgesic, in order to reduce the use of analgesic drugs and to widely use acupuncture in clinical situations.

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