

External Application of Traditional Chinese Medicines on Acupoint Shenque to Treat Gastrointestinal Reactions Caused by Intravenous Patient-Controlled Analgesia Pump in Patients After Surgery for Limb Fractures

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Wu *et al.*: Traditional Chinese Medicines on Acupoint Shenque to Treat Gastrointestinal Reactions

To explore the clinical effect of external application of Ban Xia Gan Jiang San (Powder of *Pinellia* tuber and dried ginger root) on acupoint Shenque for the treatment of gastrointestinal reactions caused by intravenous patient-controlled analgesia pump. A total of 240 patients who underwent surgery in our hospital from January 2019 to September 2020 were selected and randomly divided into a control group and a research group, 120 patients in each group. The control group received conventional treatment. The research group received external application of Ban Xia Gan Jiang San on acupoint Shenque. The clinical data of the two groups had no statistically significant differences ($p>0.05$) and the two groups were comparable. In terms of treatment effect, the research group had significantly better results than the control group and the difference was statistically significant ($p<0.05$). The external application of Ban Xia Gan Jiang San on acupoint Shenque can effectively reduce the incidence of gastrointestinal reactions caused by intravenous patient-controlled analgesia pump and it is worthy of application and promotion in clinical practice.

Key words: Acupoint Shenque, Ban Xia Gan Jiang San, intravenous patient-controlled analgesia pump, spleen-stomach disharmony

At present, patient's postoperative pain has attracted more attention. Pain has been clearly listed as the "5th vital sign" following body temperature, blood pressure, pulse and breathing rate by the 10th World Congress on Pain. Therefore, postoperative pain treatment and care has become an important part of perioperative treatment for patients after surgery^[1]. Intravenous Patient-Controlled Analgesia (IV PCA) pump is one of the most effective methods for postoperative analgesia. Compared with traditional intramuscular analgesics, the PCA pump, based on its longer-lasting analgesic effect, more closely relationship between the timing of analgesic injection and the subjective sense of pain and the tolerance of the patient himself/herself, simpler subsequent operations, safer performance and other advantages, has been widely used^[2]. However, the pump may also cause some adverse reactions, such as urinary retention, nausea and vomiting, abdominal pain and constipation, etc., causing great discomfort to the patient and significantly affecting the postoperative recovery, so it cannot be ignored in clinical practice and needs to be dealt with in time^[3]. According to statistics,

among adverse reactions caused by PCA pump, gastrointestinal reactions, including abdominal pain, bloating, nausea and vomiting, are the most common^[4]. For gastrointestinal reactions caused by PCA pump, ondansetron, methoxyclopramide and other medications are currently clinically used for symptomatic treatment, but the treatment effect is short-lasting and repeated administration is required. At the same time, such medications also have some adverse reactions and are not suitable for long-term use. If PCA pump is discontinued due to adverse gastrointestinal reactions, pain will return to the affected area. Therefore, it is very important to find a simple and operable method with few side effects and long-lasting clinical effects to prevent and treat gastrointestinal reactions caused by PCA pump. In this study, external application of Ban Xia Gan Jiang San on acupoint Shenque showed good effect in preventing gastrointestinal reactions caused by IV PCA pump, reported as follows. General data used in the study is given below. In order to exclude the stimulation effect of abdominal and other surgical operations on the gastrointestinal tract, this study only

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included patients undergoing limb orthopedic surgery. A total of 240 patients who underwent surgery for limb fractures in the Department of Orthopedics of our hospital from January 2019 to September 2020 were selected and randomly divided into a control group and a research group, 120 patients in each group. Control group includes 79 males and 41 females, aged 20~58 y, with an average age of 38.48 y, upper limb surgery 52 patients, lower limb surgery 68 patients, length of surgery 1~2.5 h, with an average of 1.86 h. Study group includes 75 males and 45 females, aged 24~60 y, with an average age of 38.17 y, upper limb surgery 49 patients, lower limb surgery 71 patients, length of surgery 1~3 h, with an average of 1.92 h. The clinical data of the two groups had no statistically significant differences ($p>0.05$) and the two groups were comparable. Inclusion criteria includes patients with age ≥ 20 y and ≤ 60 y; limb orthopedic surgery patients; PCA pump is used after surgery; Traditional Chinese Medicine (TCM) pattern differentiation which means the pattern of spleen-stomach disharmony, manifested as abdominal bloating, abdominal pain, or stomach noise, reduced and poor appetite, prone to nausea and vomiting, or abdominal bloating after dinner, belching and borborygmus, irregular bowel movements, etc. Exclusion criteria include patients with a history of digestive system diseases; patients with a history of abdominal surgery; patients with skin and drug allergies; patients who failed to cooperate with treatment. Treatment methods used in this study is as follows. For control group, provide routine preoperative preparation, postoperative routine infection prevention, analgesia, hemostasis and other symptomatic treatments. On the basis of the control group, give the study group external application of Ban Xia Gan Jiang San on acupoint Shenque. The preparation method is as follows: Grind *Pinellia* tuber and dried ginger root into powder in a 1:1 ratio for use; when applying, take 5 g powder and prepare into paste with about 2 ml of 0.9 % normal saline; put the preparation onto a special acupoint dressing sticker; conduct external application, 1 h per time, two times per day, apply from the day of the surgery and continue the treatment for 3 d. The incidence of gastrointestinal reactions such as nausea, vomiting, abdominal pain and bloating within 72 h after surgery were compared between the two groups. Response criteria^[5] was discussed below. Completely controlled means no nausea or vomiting; partially controlled means mild nausea and vomiting which do not affect eating; slightly controlled means severe nausea and vomiting which affect eating; uncontrolled means

obvious nausea and vomiting which make the patient completely unable to eat. Control rate=(Completely controlled cases+Partially controlled cases)/Total cases $\times 100$ %. TCM syndrome grading is grade according to the frequency and severity of abdominal bloating, abdominal pain, nausea and vomiting within 72 h after surgery, 3 points for less than 5 times occurrence of the above four symptoms, 6 points for 5~10 times occurrence and 9 points for more than 10 times occurrence. According to severity, classify the above four symptoms into asymptomatic, mild, moderate and severe levels, with 0 point, 2 points, 4 points and 6 points for each level, respectively. Add up the total of the four symptoms and compare. IV PCA pump usage time and patient satisfaction grading is shown here. Count the PCA pump usage time and patient satisfaction scores of the two groups. The longer the usage time is, the lower the incidence of gastrointestinal reactions will be. The total satisfaction score is 100 points and the higher the score is, the higher the satisfaction level will be. The incidence of gastrointestinal reactions between the two groups was compared. The incidence of gastrointestinal reactions in the study group was significantly lower than that in the control group and the difference was statistically significant ($p<0.05$) (Table 1). The response criteria of nausea and vomiting between the two groups were compared. The control rate of nausea and vomiting in the study group was significantly higher than that in the control group and the difference was statistically significant ($p<0.05$) (Table 2). TCM syndrome scores between the two groups were compared. The score of the study group within 72 h after surgery was significantly lower than that of the control group and the difference was statistically significant ($p<0.05$) (fig. 1). Comparison of IV PCA pump usage time and patient satisfaction scores between the two groups were shown here. The PCA pump usage time in the study group was significantly longer than that in the control group and the difference was statistically significant ($p<0.05$). The satisfaction score of the study group was significantly better than that of the control group and the difference was statistically significant ($p<0.05$) (fig. 2). TCM always had good effects on gastrointestinal reactions caused by various clinical treatments or Western medicines, such as gastrointestinal reactions caused by chemotherapeutic drugs, gastrointestinal reactions in pregnant women and gastrointestinal reactions after abdominal surgery^[6-10]. Therefore, TCMs provide a good idea for the treatment of gastrointestinal reactions caused by IV PCA pump. Gastrointestinal reactions

caused by PCA pump are mainly manifested as abdominal bloating, abdominal pain or stomach noise, reduced and poor appetite, prone to nausea and vomiting, or abdominal bloating after dinner, belching and borborygmus, irregular bowel movements, etc. which are categorized as the pattern of spleen-stomach disharmony according to TCM pattern differentiation. Therefore, the author believes that the main therapeutic principle for gastrointestinal reactions caused by IV PCA pump is to harmonize the spleen and stomach. Since most patients with this pattern are difficult to take medicines, external therapies are the main method. The author used external application of Ban Xia Gan Jiang San on acupoint Shenque. This method belongs to the TCM umbilical therapy which can stimulate acupuncture points in the belly button, go into the skin, pass through and energize the meridians and collaterals, coordinate organ functions, dredge channels, promote the energy and blood supply among the organs, regulate yin and yang, strengthen energy and eliminate evil, thus to prevent and treat diseases^[11]. Shenque, also known as qizhong (the center of the belly button), is an important acupuncture point on the Ren channel. Located in the belly button and parallel to acupoint mingmen, Shenque can regulate the meridians and collaterals in the whole body and connect the five solid organs and six hollow organs, the limbs and bones, the five sensory organs and nine orifices, as well as the skin, flesh and fascia. “The umbilicus is the basis of the five solid organs and six hollow organs, and the root of vigor return and collection”, as the saying goes. This point is in the portal of original spirit, so it has the effect of recovering

yang, saving qi and resuscitating a faint. In addition, as located in the middle of the abdomen, the hub of the lower Jiao (Burner), near the stomach and intestines, this point can also strengthen the spleen and stomach, regulate the intestines and treat diarrhea^[12,13]. Besides apoplectic collapse and cold limbs with phlegm, this point can also be used to treat diarrhea, angina and other diseases. *Pinellia* tuber is pungent in taste and warming in action. It can enter the spleen and stomach, eliminate dampness, resolve phlegm and dissipate stagnation, regulate qi and prevent vomiting. Clinically, *Pinellia* tuber can be used for symptoms such as excessive phlegm, cough and asthma, dizziness and palpitation with phlegm and fluid retention, dizziness with internal phlegm, vomiting and nausea, chest tightness, etc. Dried ginger root is pungent in taste and heating in action. It can enter the spleen, stomach, kidney, heart and lung, warm the spleen and stomach, support yang and dispel coldness. Clinically, dried ginger root is used for symptoms such as abdominal pain and coldness, vomiting and diarrhea, cold limbs and weak pulses, cough and asthma with cold fluid, etc. Modern pharmacology has confirmed that the external application of the two materials on acupoint Shenque in this study mainly played the effects of harmonizing the spleen and stomach as well as regulating qi and prevents vomiting. This study confirmed that the external application of TCMs on acupoint Shenque can effectively reduce the incidence of gastrointestinal reactions caused by IV PCA pump and it is worthy of application and promotion in clinical practice.

TABLE 1: COMPARISON OF THE INCIDENCE OF GASTROINTESTINAL REACTIONS BETWEEN THE TWO GROUPS

Group	Number of cases	Number of cases developing adverse reactions	Incidence
Control group	120	43	35.8 %
Study group	120	14	11.7 %
53	53	53	53

Note: *p<0.05 compared with the control group

TABLE 2: COMPARISON OF THE RESPONSE CRITERIA OF NAUSEA AND VOMITING BETWEEN THE TWO GROUPS

Group	Number of cases	Completely controlled	Partially controlled	Slightly controlled	Uncontrolled	Control rate
Control group	120	19	28	32	41	65.8 %
Study group	120	25	36	48	11	90.8 %*

Note: *p<0.05 compared with the control group

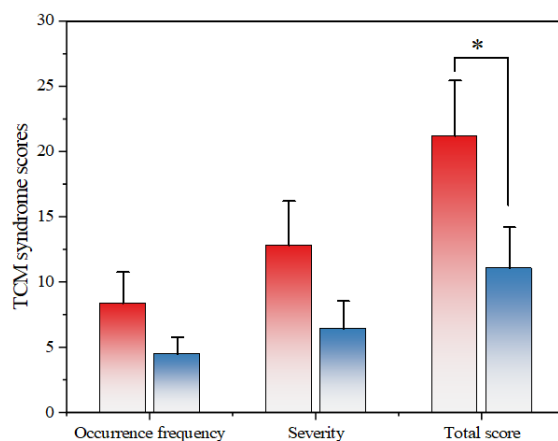


Fig. 1: Comparison of TCM syndrome scores between the two groups, * $p < 0.05$ compared with the control group, (■) Control group; (■) Study group

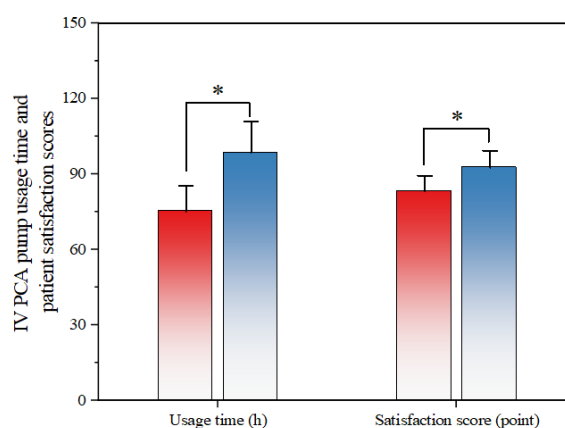


Fig. 2: Comparison of IV PCA pump usage time and patient satisfaction scores between the two groups, * $p < 0.05$ compared with the control group, (■) Control group; (■) Study group

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Conflict of interests:

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