J Acupunct Meridian Stud 2016;■■(■):■■–■■

Available online at www.sciencedirect.com

Journal of Acupuncture and Meridian Studies

journal homepage: www.jams-kpi.com

CLINICAL CASE REPORT

Acupuncture in the Management of Intraoperative Nausea and Vomiting

Francisco Gouveia*, Carmen Oliveira, Nuno Losa

Centro Hospitalar Vila Nova de Gaia-Espinho, Department of Anesthesiology, Portugal

Available online ■ ■ ■

Received: May 30, 2016
Revised: Aug 31, 2016
Accepted: Sep 7, 2016

KEYWORDS
acupressure;
acupuncture;
anesthesia;
nausea

Abstract
Intraoperative and postoperative nausea and vomiting (IONV and PONV, respectively) are common complications of anesthesia with significant associated morbidity. Strategies for their prevention and treatment have been organized in pharmacological and nonpharmacological measures. Acupuncture at PC6 has demonstrated efficacy in randomized trials, although evidence regarding its efficacy in treating IONV and PONV has not yet been fully established. We present the case of a patient who underwent peripheral vascular surgery on a limb under a subarachnoid block and who developed IONV refractory to conventional pharmacological therapy. Acupuncture at the PC6 and the TF4 points proved to be an effective alternative treatment to conventional pharmacological treatment and resulted in almost immediate cessation of IONV.

1. Introduction

Intraoperative and postoperative nausea and vomiting (IONV and PONV, respectively) are common complications of anesthesia and, although self-limiting, may cause significant morbidity, including dehydration, water and electrolyte imbalances, suture dehiscence, esophageal rupture, and serious airway compromise [1]. They are also associated with increased length of hospital stay and increased hospital costs [1–3].

Estimating an individual's risk for PONV can indicate who will most likely benefit from prophylaxis. In adults, only a few baseline risk factors occur with enough consistency to be considered independent predictors for PONV [3]. Risk factors for PONV can be categorized into three groups: patient-specific risk factors, anesthesia-related risk factors, and surgical risk factors. Female sex, nonsmoking, and history of PONV or motion sickness are among the most important and prevalent patient-specific predictors. Anesthesia-related independent predictors are general anesthesia with volatile anesthetics, nitrous oxide, and the use of postoperative opioids. Surgical risk factors are associated with the type and the duration of surgery: PONV risk increases by 60% for every 30-minute increase in the

* Corresponding author. Rua Conceição Fernandes, 4434-502 Vila Nova de Gaia, Portugal.
E-mail: francisco.correia.gouveia@hotmail.com (F. Gouveia).

pISSN 2005-2901 eISSN 2093-8152
http://dx.doi.org/10.1016/j.jams.2016.09.005

Please cite this article in press as: Gouveia F, et al., Acupuncture in the Management of Intraoperative Nausea and Vomiting, Journal of Acupuncture and Meridian Studies (2016), http://dx.doi.org/10.1016/j.jams.2016.09.005

duration of surgery. Breast and gynecological surgeries represent the most frequent reports of PONV in adults. Strabismus, hernia repair, orchidopexy, and penile surgery are associated with higher incidences of PONV in children [2,3].

The literature comparing IONV with PONV is scanty. Some studies suggest that the overall incidence of IONV can reach 42% in patients undergoing subarachnoid anesthesia for nonobstetric surgery, whereas the incidence rates for PONV in that group range from 40% to 90% [1]. The risk factors for IONV include both anesthesia-related causes (e.g., hypotension, excessive vagal activity, and parenteral or neuraxial opioids) and nonanesthesia-related causes (e.g., surgical stimulus, sudden mobilization in susceptible individuals, and medications such as antibiotics and uterotonic agents) [1].

Regional anesthesia is associated with a lower incidence of both IONV and PONV compared with general anesthesia. Nevertheless, when performing a neuraxial approach, the high sympathetic block, the development of hypotension, and the use of intrathecal morphine are associated with higher rates of IONV and PONV [4,5]. Increased vagal activity after a sympathetic block stimulates peristalsis, which could lead to these symptoms [6].

Management of IONV and PONV requires pharmacological and nonpharmacological measures, and these encompass acupuncture, acupressure, transcutaneous electrical nerve stimulation, and electroacupuncture [7,8]. However, the limited efficacy and the side effects associated with antiemetics used as prophylaxis and treatment for IONV and PONV have led to the need for alternative treatments [2,8].

Acupuncture is a Chinese millenary treatment consisting of the stimulation of specific points on any of 12 individual meridians that control the flow of energy ("qi") throughout the body [9]. Each meridian has a distinct number of points located along it, and it passes through or near the organ for which the meridian is named. Inhabiting the 12 meridians are 365 common points, with each point being denoted by the meridian name followed by a specific number. In addition to the points within the meridian system, several points and systems exist on "extra" meridians and anatomical regions such as the ear (i.e., auricular acupuncture) [9–11].

Acupuncture has numerous indications, including nausea and vomiting during the perioperative period. Although not completely understood, the antiemetic effect of acupuncture apparently stems from the resultant increase in hypophyseal secretion of beta-endorphins and adrenocorticotropic hormone, with subsequent inhibition of the chemoreceptor trigger zone and vomiting center. Acupuncture also affects the upper gastrointestinal tract, decreasing acid secretion [12].

Acupuncture point PC6 (also named *Neiguan*) is located on the Meridian Pericardium *Jueyin*; its stimulation regulates the flows of *qi* and blood, which have been altered by surgery [5]. PC6 is located on the anterior side of the distal part of the forearm, 2 cm proximal to the wrist crease, between the tendons of the palmaris longus and the flexor carpi radialis [13]. Another important acupuncture point is auricular TF4 (*Shenmen*), located on the upper half of the ear, near the inferior lateral wall of the triangular fossa. *Shen* means mind, spirit, consciousness; *men* stands for door, gate. It shares the name and the activities of another point on the Heart Meridian (HT7), although the former shows a broader range of therapeutic effects. TF4 stimulation relieves anxiety, reduces the occurrence of nausea and vomiting, and improves the functions of the stomach and the intestine to expedite postoperative recovery [14]. Similarly, other acupuncture points are associated with the reduction of pain, anxiety, and nausea and vomiting after surgery [2,9,15]. These can reduce the requirement for anesthesia [9]. Adverse effects arising from acupuncture are uncommon and usually self-limiting, with the most frequent being local erythema, edema, paresthesias and pain [2]. Serious complications have not been reported [2].

We present the case of IONV refractory to conventional pharmacological therapy that was successfully managed with acupuncture and acupressure as an alternative therapy. In our case, the conventional therapy would have been the administration of naloxone or a conversion to an anesthetic procedure involving general anesthesia with an increased risk of cardiac and pulmonary complications. Thus, acupuncture proved to be a safe and effective alternative to the conventional pharmacological treatment of IONV.

2. Case Presentation

We report the case of a 78-year-old female patient scheduled for a left femoropopliteal bypass owing to a history of a very limitative intermittent claudication with several months of evolution. An inferior limb Eco-Doppler showed a significant atherosclerotic occlusion on the left femoral artery with surgical indication. She had a poorly controlled arterial hypertension, although it had been medicated with two different classes of antihypertensive drugs. She had no clinical history of anesthetic complications including IONV or PONV.

After the preanesthetic evaluation, exclusion of contraindications and American Society of Anesthesia (ASA) standard monitoring (noninvasive arterial blood pressure and heart rate, pulse oximetry, continuous electrocardiogram), 4 mg dexamethasone IV was administered as a PONV prophylaxis. After that, the subarachnoid block was performed using a beveled Quincke needle with a 25-gauge caliber; then, 12 mg hyperbaric bupivacaine and 0.4 mg morphine were administered. The technique proceeded uneventfully.

After the quality of the subarachnoid block had been tested, surgery was initiated. The surgical procedure consisted of skin incisions, then dissection until identification of the vascular structures (femoral artery, saphenous vein, popliteal artery among others) in the femoral and popliteal area. When these structures had been identified, the lesions could be identified and bypassed with healthy veins or prosthetic material. Twenty minutes after the beginning of the surgery, when the vascular structures were being identified, the patient started complaining of nausea and started vomiting. An intravenous administration of 4 mg ondansetron was prescribed, resulting in a slight improvement of the symptoms. Thirty minutes after the initial treatment and because of a recurrence of symptoms, a decision was made to sequentially administer 0.625 mg

Please cite this article in press as: Gouveia F, et al., Acupuncture in the Management of Intraoperative Nausea and Vomiting, Journal of Acupuncture and Meridian Studies (2016), http://dx.doi.org/10.1016/j.jams.2016.09.005