

Efficacy of laser acupuncture in attenuating haemodynamic response to orotracheal intubation and post operative nausea and vomiting in children undergoing strabismus surgery

Thesis

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Abstract

The results of this study showed that laser stimulation of acupuncture points P6 and Liv3 can abolish but not prevent haemodynamic stress response to endotracheal intubation in children, and effectively decrease post operative nausea, retching, and vomiting in children undergoing strabismus surgery.

Key word

MAP- DBP-(Liv3 & P6)- Laser stimulation- PONV- orotracheal intubation- haemodynamic

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Introduction

Introduction

Acupuncture, one of the leading branches of alternative medicine was approved by the WHO as one of the useful tools in the management of a big list of diseases and painful conditions. Being cheap, somewhat simple and nearly without side effects acupuncture was tried in nearly most of the medical problems.¹

when anesthetizing a child for strabismus or middle ear surgery, one may be confronted with many problems : hypertension & tachycardia associated with intubation, hemodynamic reflexes associated with traction on ocular muscles in addition to increased incidence of post operative nausea and vomiting.²

Laryngoscopy and orotracheal intubation are associated with haemodynamic responses and a rise in plasma concentrations of catecholamines.³ The resulting tachycardia and hypertension may be associated with an increase in morbidity in some patients.^{4,5}

Two symptomatic acupuncture points are chosen to minimize haemodynamic response to intubation: the first is point Liv 3 which is located in the first metatarsal space 1- 2 Cun proximal to the web space and has a blood pressure lowering effect and the second is point P 6 which lies between the tendons of palmaris longus and flexor carpii radialis muscles proximal to the wrist crease and has a regulatory effect on heart rate.⁶

Post-operative nausea and vomiting (PONV) is a distressing and common problem after strabismus surgery, with an incidence between 40 and 90% in those who did not receive antiemetic prophylaxis.^{7,8}

Although proemetic mechanisms of strabismus surgery are still not clearly understood, drugs acting on serotonin, histamine, or dopamine receptors in the chemoreceptor trigger zone decrease PONV after strabismus surgery.^{9,10}

As anaesthetists continue to search for more cost-effective approaches to improving patient outcome, attention has focused on simple, inexpensive and non-invasive methods to prevent PONV.¹¹

There is interest in the use of alternative approaches to preventing emesis, brought about by concerns regarding side effects associated with traditional pharmacological antiemetics and the cost of newer agents.¹¹

Various non-pharmacological techniques have been examined as alternatives to antiemetic drugs, these include acupuncture, electro-acupuncture, laser acupuncture, transcutaneous electrical nerve stimulation, acupoint stimulation and acupressure.¹¹

Most non-pharmacological studies have focused on the stimulation of the wrist at the Pericardium (P6) acupuncture point to reduce nausea and vomiting. The mechanism by which P6 acupoint stimulation prevents PONV has not been established.¹²

Review of literature

Theory and history of acupuncture

Acupuncture is the stimulation of specific points on the body by a variety of techniques, including the insertion of thin metal needles through the skin. It is intended to remove blockages in the flow of qi and restore and maintain health aims to restore and maintain health through the stimulation of specific points on the body.¹³

There are purported to be twelve major meridians in the human body, which are thought to be channels for the flow of vital energy or life force called qi (also spelled ch'i or ki, and pronounced "chee" or "kee") that is present in all living things. Meridians also represent an internal system of communication between specific organs or networks of organs. According to traditional Chinese medicine theory, illness may occur when the energy flow along one or more meridians is blocked or out of balance. The goal of acupuncture is to restore health and balance to the energy flow. Supporters claim that acupuncture can be used to treat physical illness, addiction, and mental illness.¹⁴

Qi: In traditional Chinese medicine, the vital energy or life force proposed to regulate a person's spiritual, emotional, mental, and physical health and to be influenced by the opposing forces of yin and yang.¹⁵

Traditional Chinese medicine (TCM): means a whole medical system that originated in China. It is based on the concept that disease results from disruption in the flow of qi and imbalance in the forces of yin and yang.

Yin and yang: The concept of two opposing yet complementary forces described in traditional Chinese

medicine. Yin represents cold, slow, or passive aspects of the person, while yang represents hot, excited, or active aspects. A major theory is that health is achieved through balancing yin and yang and disease is caused by an imbalance leading to a blockage in the flow of qi.¹⁵

Acupuncture is among the oldest healing practices in the world, as part of traditional Chinese medicine, it is based on the concept that disease results from disruption in the flow of qi and imbalance in the forces of yin and yang.¹⁶ Practices such as herbs, meditation, massage, and acupuncture seek to aid healing by restoring the yin-yang balance and the flow of qi.¹⁷ In the United States, where practitioners incorporate healing traditions from China, Japan, Korea, and other countries, acupuncture is considered part of complementary and alternative medicine which means a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine.¹⁸ Complementary medicine is used together with conventional medicine, and alternative medicine is used in place of conventional medicine.¹⁸

Acupuncture has been practiced in the United States for about 200 years. The U.S. Food and Drug Administration approved the acupuncture needle as a medical device in 1996.¹⁹

In China, acupuncture is used as an anesthetic during surgery and is believed to have the power to cure diseases and relieve symptoms of illness. According to the theories and teachings of traditional Chinese medicine explain that acupoints lie along invisible meridians.¹⁹

Relatively few complications have been reported from the use of acupuncture.²⁰ However, acupuncture can cause potentially serious side effects if not delivered properly by a qualified practitioner.¹⁷

Acupuncture has been practiced in China and other Asian countries for more than 4,000 years.²¹ In China, acupuncture is part of a TCM system of traditional medical knowledge and is practiced along with other treatment modalities such as herbal medicine, tui na (massage and acupressure), mind/body exercise (e.g., qigong and tai chi), and dietary therapy. In the United States, several different acupuncture styles are practiced in addition to TCM. These include Japanese acupuncture (e.g., meridian therapy), English acupuncture (e.g., five element or traditional acupuncture), French acupuncture (e.g., French energetic acupuncture), Korean acupuncture (e.g., constitutional acupuncture), and American medical acupuncture. Most of these are derived from ancient Chinese medical philosophy and practices. All are based on the view that the human body must be perceived and treated as a whole and as part of nature; health is the result of harmony among bodily functions and between the body and nature, and disease occurs when this harmony is disrupted. TCM therapeutic interventions, including acupuncture are used to restore the state of harmony.¹³

Practiced in China and other Asian countries for thousands of years, acupuncture is one of the key components of traditional Chinese medicine. In traditional Chinese medicine, the vital energy or life force proposed to regulate a person's spiritual, emotional, mental, and physical health and to be

influenced by the opposing forces of yin and yang. (vital energy) along pathways known as meridians.¹⁶ Qi can be unblocked, according to TCM, by using acupuncture at certain points on the body that connect with these meridians. Sources vary on the number of meridians, with numbers ranging from 12 to 20. One commonly cited source describes meridians as 14 main channels "connecting the body in a web like interconnecting matrix" of at least 2,000 acupuncture points.¹⁷

Their findings, published in *Birth*, show that women less than 14 weeks pregnant can significantly reduce nausea and dry retching by using traditional or pericardium 6 (p6) acupuncture.²³

The report from a Consensus Development Conference on Acupuncture held at the National Institutes of Health (NIH) in 1997 stated that acupuncture is being "widely" practiced—by thousands of physicians, dentists, acupuncturists, and other practitioners—for relief or prevention of pain and for various other health conditions.²⁴ According to the 2007 National Health Interview Survey, which included a comprehensive survey of Americans, an estimated 3.1 million U.S. adults and 150,000 children had used acupuncture in the previous year. Between the 2002 and 2007 NHIS, acupuncture use among adults increased by three-tenths of 1 percent (approximately 1 million people).²⁴

The concept of meridians

The concept of meridians (Chinese: jing-luo) arises from the techniques and doctrines of traditional Chinese medicine including acupuncture and acupressure. According to these practices, the body's vital energy,

"qi", circulates through the body along specific interconnected channels called meridians. Disruptions of the body's energy flow (such as stagnations, blockages and redirection) are thought to cause emotional and physical illness. To release those disruptions, specific points on the meridians called acupoints, or tsubo in the Japanese practice, are stimulated via needles, pressure or other means.

The Standard Acupuncture Nomenclature published by the World Health Organization listed about 400 acupuncture points and 20 meridians connecting most of the points.

There are twelve meridians on the arms and the legs: Heart, Lung, Pericardium, Small Intestine, Large Intestine, Triple Warmer, Kidney, Spleen, Liver, Stomach, Bladder, and Gall Bladder. Meridians are divided into Yin and Yang groups. The Yin meridians of the arm are, Heart, Lung and Pericardium. The Yang meridians of the arm are: Small Intestine, Large Intestine, and Triple Warmer. The Yin Meridians of the leg are Kidney, Spleen, and Liver. The Yang meridians of the leg are Stomach, Bladder, and Gall Bladder.²⁵

Treatment of acupuncture points may be performed along the twelve main or eight extra meridians, located throughout the body, or on 'ashi' points. Of the eight extra meridians, only two have acupuncture points of their own, the other six are 'activated' by using a master and couple point technique which involves needling the acupuncture points on the twelve main meridians that correspond to the particular extra meridian. Ten of the main meridians are named after organs of the body (Heart, Liver, etc.), and the other two are named after so-called body functions (Heart Protector or Pericardium,