



Effect of Acupressure Technique with Wristband on Postoperative Nausea and Vomiting in Laparoscopic Cholecystectomy Patient

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ABSTRACT

Background: Laparoscopic cholecystectomy is widely recognized as the preferred method for treating gallstone disease. However, like any surgical procedure involving anesthesia, it carries the risk of postoperative complications, including common side effects such as vomiting and nausea. As a result, acupressure treatments targeting the pericardium 6 (P6) point have gained attention in alleviating nausea and vomiting. This non-invasive massage technique has been emphasized by the World Health Organization (WHO) due to its significance.

Objectives: The main purpose of this study is to assess the impact of acupressure treatment at the wristband point (P6) on nausea and vomiting experienced by patients undergoing laparoscopic cholecystectomy.

Methodology: A quasi-experimental study was conducted at Safer Al Imam Al Hussein Surgical Hospital in Karbala Holy City. Sixty patients undergoing laparoscopic cholecystectomy were divided into two groups: 30 patients in the intervention group received acupressure techniques using an elastic wristband postoperatively, which was removed after six hours, while 30 patients in the control group received routine conventional care. Descriptive analysis (e.g., frequency, percentage, and mean score) and inferential analysis (e.g., one-way ANOVA test, independent sample t-test) were employed to examine and measure the study outcomes. A p-value of <0.05 was considered statistically significant.

Results: The mean score for nausea and vomiting in the intervention group decreased significantly from 1.97 ± 0.183 before the intervention to 1.13 ± 0.354 after implementing the intervention (p-value = 0.000). In contrast, the control group did not experience any improvement in their symptoms, with their condition worsening significantly.

Conclusion: Patients experiencing nausea and vomiting after laparoscopic cholecystectomy surgery may benefit from the non-invasive treatment of wristband acupressure.

Keywords: Acupressure, laparoscopic cholecystectomy, vomiting, nausea.

INTRODUCTION

Cholecystectomy is the second most common abdominal procedure in general surgery, following appendectomy. It is a common surgical treatment for acute cholecystitis, which occurs when a gallstone blocks the cystic duct (Mannam et al., 2023).

Gallstone disease affects approximately 10% to 20% of people worldwide and is a significant risk factor for gallbladder cancer (Mahmood, 2023). Laparoscopic cholecystectomy (LC) is widely used and offers advantages such as minimal invasiveness, quick

postoperative recovery, and reduced pain. However, there are potential risks, including postoperative nausea and vomiting (Pang et al., 2020).

Postoperative complications can occur with any surgical procedure that requires anesthesia. PONV is one of the most common complications, second only to pain (Hamid et al., 2022). Surgical procedures like laparoscopic cholecystectomy carry an additional risk of PONV. Patients who experience PONV often have lower satisfaction levels with their care. PONV accounts for approximately 30% of cases in the general surgical population and can be as high as 80% in high-risk patient groups. PONV may also increase the risk of postoperative complications and prolong the patient's stay in the post-anesthesia care unit (PACU), resulting in a significant increase in healthcare costs (Jin et al., 2020). Additionally, PONV can lead to aspiration pneumonia, aspiration of vomit, and obstruction of the respiratory system. Psychologically, nausea is an extremely unpleasant sensation that, if experienced after surgery, may create a lasting aversion to future surgical procedures (Himani et al., 2022).

Recent research has highlighted the importance of non-pharmacological interventions, which have fewer side effects. Complementary medicine, such as acupressure, a traditional non-invasive massage technique, has been used for the treatment of various ailments. Its significance is further emphasized by the World Health Organization's recognition of it as an additional medical practice. The fundamental goal of acupressure is to promote a balanced flow of chi energy through meridians, which are channels that distribute energy throughout the body (Imani et al., 2024).

Non-drug therapies, also known as "Complementary and Alternative Medicine" (CAM), are becoming increasingly popular as supportive care. The P6 point, located three finger widths above the initial wrist crease on the outside of the forearm where the palmaris longus and flexor carpi radialis tendons connect, is specifically targeted for acupressure. Pressure can be applied by using fingertips or by wearing an elastic bracelet with an inserted stud (Alwan & Athbi, 2023). Acupressure on the P6 acupuncture point has been found to be as effective as pharmaceutical techniques in preventing

postoperative nausea and vomiting (Ünülü & Kaya, 2018).

AIMS OF THE STUDY

The main objective of this research study is to determine whether the presence of acupressure points on the wrists of patients undergoing laparoscopic cholecystectomy surgery leads to a reduction in postoperative nausea and vomiting when utilizing these techniques.

METHODOLOGY

Research design:

This study utilized a quasi-experimental design. The data was collected between September 25th, 2023, and March 26th, 2024.

Participants and sampling:

A total of 60 patients who underwent cholecystectomy were included in the study. Each patient was assigned to either the intervention group or the control group, with 30 patients in each group. The researchers used a deliberate non-random purposive sampling technique to select the sample. They made decisions based on their own judgment regarding which individuals from the population should be included in the study.

Ethical consideration:

The work presented in this study has been approved by the Scientific Research Ethical Committee at the Nursing College/University of Kerbala. Prior to participating in the study, each subject provided informed consent. Furthermore, all participants have the freedom to withdraw from the research at any time.

Materials & Measures:

An instrument was developed to assess the impact of point 6 acupressure treatment on the severity of nausea and vomiting in patients undergoing cholecystectomy. The instrument comprises two components. The first section includes socio-demographic and clinical data such as age,

sex, education level, occupation, smoking status, height, and weight.

The second section utilizes the Rhodes Index of Nausea, Vomiting, and Retching (RINVR) scale, originally developed by Kim et al. (2007) to assess postoperative nausea, vomiting, and retching. This scale consists of 8 items and the English version was used. Translation into Arabic was performed using a bilingual translation method. The researcher employed expert suggestions to ensure the validity and reliability of the scale before implementation.

This interventional protocol:

The researcher developed an intervention protocol based on her clinical expertise in patient treatment, a thorough analysis of relevant scientific literature, and previous studies on the management of nausea and vomiting. The objective of this intervention is to use acupressure techniques on the pericardium point P6 to reduce the severity of postoperative nausea and vomiting. Patients are instructed to wear an elastic wristband for the first hour after surgery and to apply pressure to the stud on the band for two to three minutes every hour. After six hours, the band can be taken off.

Statistical analysis:

The researchers examined and analyzed the study data using the IBM program Statistical Package of Social Sciences Version 25. They employed descriptive and inferential statistical procedures, which included calculating the frequency, percentage, and mean of scores. Furthermore, the researchers utilized one-way ANOVA and independent sample t-tests to compare the means of nausea scores before and after the intervention. The results were deemed statistically significant, as the p-value was less than 0.05.

RESULTS

A total of 60 patients who underwent cholecystectomy were included in the study. According to **Table (1)**, the average age of patients enrolled in this study was 43.3% for the control group

and 20-39 years old, while it was 53.3% for the acupressure group. In terms of gender, 76.7% of both the control and acupressure groups were female. The educational levels of the participants were as follows: 43.3% of the control group and 23.3% of the acupressure group had a primary school education. In terms of occupational status, 60% of the acupressure group were housewives, while 76.7% of the control group were as well. Most of the patients were nonsmokers, with percentages of 76.7% and 60% for the control and acupressure groups, respectively. All sample members were given anti-emetics, with 100% for both groups. Furthermore, 63.3% of patients in the control group were overweight, while 43.3% of the acupressure group were as well.

Table (2) shows that one hour postoperatively, the patients in the control group and acupressure group experienced a moderate level of nausea and vomiting at percentages of 53.3% and 46.7%, respectively. After six hours, the second test reported that the patients in both groups had a mild level of nausea and vomiting, with percentages of 76.6% and 96.7% for the control and acupressure groups, respectively.

Table (3) reveals a significant difference between the pretest and posttest nausea and vomiting status among patients with laparoscopic cholecystectomy in all two groups. Specifically, in the control group, the t value was 4.163 at a p-value of 0.043, while in the acupressure group, the t value was 9.352 at a p-value of 0.000.

Table (4) shows that the two groups of patients experienced different degrees of nausea and vomiting, indicating a noticeable improvement in the severity of these symptoms in one group compared to the other. Using the RINVR scale, this table reports a mean difference of 1.300 between the control and acupressure groups, with a p-value of 0.000.

Table (5) indicates that there is no statistically significant correlation between the reduction of nausea and excessive vomiting and the demographic characteristics and clinical data categories (age,

educational level, occupational status, BMI, sex, and smoking status). This means that all patients, regardless of their demographic characteristics and clinical data, benefited from using acupressure to alleviate vomiting and nausea.

DISCUSSION:

This quasi-experimental study utilized acupressure wrist bands in the intervention group, but not in the control group. The results show a significant overlap in the sample distribution, with mean ages of 43.3% in the control group and 53.3% in the intervention group falling within the age range of 20-39 years. The standard deviations were 14.04 and 15.2 for the control and acupressure groups, respectively. These findings are consistent with a randomized controlled trial conducted by Karagoz and Sayilan (2023), which examined the effects of acupressure following laparoscopic cholecystectomy, with a mean age of 51.59 ± 13.39 .

In terms of gender composition, 76.7% of both the control and acupressure groups were female. This finding aligns with the results of a study by Çakmak et al. (2022) that investigated the role of P6 acupressure in postoperative nausea and vomiting following laparoscopic cholecystectomy, where approximately 84.0% of the patients were female. Moreover, these results are in agreement with a study conducted by Al-Hayali (2021) that explored the incidence and efficacy of elective laparoscopic cholecystectomy, where the majority of the patients were also female, with a mean age of 49.1 ± 13.3 years.

Regarding educational levels, 43.3% of the control group and 23.3% of the acupressure group had completed primary school. Farhadi et al. (2016), in their randomized controlled trial investigating the effectiveness of P6 acupoint in preventing postoperative nausea and vomiting, similarly reported that the majority of participants in both the experimental and control groups had completed primary education (37% and 33% respectively).

In terms of occupational status, 60% of the acupressure group were housewives, while 76.7% of the control group were housewives. This finding is consistent with a randomized controlled trial conducted by Eslami et al. (2019) in Iran, which sought to determine the impact of applying acupressure to the Pericardium 6 acupoint on postoperative nausea and vomiting. The study revealed that 40% of patients in the intervention group and approximately 31.4% in the control group were housewives. Lastly, all participants in our study received antiemetics, accounting for 100% in both groups. Elvir et al. (2020) reported that postoperative nausea and vomiting (PONV) is common, and patients should be given different antiemetic drugs with various mechanisms of action after surgery and prior to discharge. Our study shows that participants were evenly distributed between the two groups based on demographic characteristics, with no statistically significant differences. The majority of patients, 76.7% in the control group and 60% in the acupressure group, were nonsmokers. A study by Shrestha et al. (2021) found that approximately 92% of their patients were nonsmokers, with a small percentage being smokers. Among the nonsmokers in our study, 56.5% experienced PONV compared to 26.6% of smokers.

Regarding the BMI of our patients, the table indicates that 63.3% of the control group were classified as overweight, while 43.3% of the acupressure group fell under obesity class I. There was a statistically significant difference in BMI categories between the groups, with a p-value of 0.014. This finding aligns with a randomized controlled study by Unlue & Kaya (2018), which found that approximately 43.26% of patients in the acupressure group were overweight, while 40.83% in the control group fell under obesity class I. The p-value in that study was 0.022.

Table 2 presents the results of the pre- and post-test assessments of nausea and vomiting levels in the control and acupressure groups. One hour after

surgery, the control group reported a moderate level of nausea and vomiting at 53.3%, while the acupressure group reported 46.7%. After six hours, the second test showed that both groups experienced a mild level of nausea and vomiting, with percentages of 76.6% for the control group and 96.7% for the acupressure group. These findings are consistent with a study by Putra et al. (2021), which demonstrated that patients initially had a moderate degree of nausea and vomiting before receiving acupressure, but experienced a significant reduction in symptoms resulting in mild nausea after the intervention.

Table 3 demonstrates significant correlations between pretest and posttest nausea and vomiting status in both the control and acupressure groups. In the control group, the t-value was 4.163, with a p-value of 0.043. Similarly, the acupressure group showed a t-value of 9.352, with a p-value of 0.000. These findings align with a study conducted by Salamah et al. (2023), which revealed that acupressure, as a non-invasive acustimulation technique, can be an alternative to pharmacological medication for preventing PONV in patients.

Table 4 reveals variations in the degree of nausea and vomiting between patients in two groups, indicating a noticeable improvement in the degree of symptoms in one group compared to the other. The RINVR scale was used to report a mean difference of 1.300 ($p < .000$) between the control and acupressure groups. This finding is consistent with a randomized placebo-controlled study conducted by Kiliç and Oulu in 2022, which demonstrated the effectiveness of acupressure in reducing nausea, vomiting, pain, and sleep disturbances post laparoscopic cholecystectomy. Similarly, another study by Mohsin et al. (2022) conducted a randomized clinical trial in Iraq and found that non-pharmacological methods for the prevention of postoperative nausea and vomiting are as effective as pharmacological methods.

Table 5 indicates that there is no statistically significant relationship between the improvement in

the degree of nausea and vomiting and various demographic and clinical characteristics such as age, educational level, occupational status, BMI, sex, and smoking status. This suggests that all patients, regardless of these characteristics, derived benefits from acupressure therapy in alleviating the severity of symptoms. These findings align with a randomized controlled trial conducted by Gülten and Banu in 2020, which evaluated the effectiveness of acupuncture as an adjunct to routine postoperative care after laparoscopic cholecystectomy. The study found no significant difference between the groups in terms of demographic and clinical characteristics.

Study Limitations

The main limitation of the current study was that patients self-administered acupressure wrist band; thus, they might not have followed the intervention closely because of physical or psychological issues. Additionally, there was no follow-up assessment time, and the study intervention was also rather brief. Additional study is recommended to assess the long-term impacts of acupressure wrist band in reducing nausea and vomiting post-laparoscopic cholecystectomy.

CONCLUSIONS:

In conclusion, applying the acupressure technique, specifically by using an elastic wrist band, for 2-3 minutes every hour over a period of 6 hours has been proven effective in reducing nausea and vomiting intensity in adult patients who have undergone laparoscopic cholecystectomy.

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TABLES:

Table (1): Distribution of participants according to their demographic characteristics and clinical data

Demographic characteristics		Control group		Acupressure group		p-value
		N	%	n	%	
Age	< 20 years	0	0	1	3.3	.744
	20- 39 years	13	43.3	16	53.3	
	40- 59 years	13	43.3	5	16.7	
	≥ 60 years	4	13.4	8	26.7	
	Mean	44		43		
	S.D	14.04		17.9		
	Total	30	100	30	100	
Sex	Male	7	23.3	7	23.3	.227
	Female	23	76.7	23	76.7	
	Total	30	100	30	100	
Educational level	Illiterate	5	16.7	5	16.7	.35
	Read and write	6	20.0	7	23.3	
	Primarily school	13	43.3	7	23.3	
	Secondary school	1	3.3	5	16.7	
	Institute	3	10.0	0	0	
	Collage And More	2	6.7	6	20.0	
	Total	30	100	30	100	
Occupational status	Retired	1	3.3	0	0	.63
	Housewife	23	76.7	18	60.0	
	Government employee	4	13.4	9	30.0	
	Unemployed	1	3.3	2	6.7	
	Free business	1	3.3	1	3.3	
Are you a smoker?	yes	7	23.3	12	40.0	.44

Were you given anti-emetics	No	23	76.7	18	60.0	---
	Yes	30	100	30	100	
BMI	No	0	0	0	0	.014
	Normal	0	0	1	3.3	
	Over weight	19	63.3	13	43.3	
	Obesity class I	9	30.0	10	33.3	
	Obesity class II	2	6.7	6	20.0	
	Obesity class III	0	0	0	0	
Total		30	100	30	100	

Table (2): levels of nausea and vomiting among patients with cholecystectomy using RINVR scale

Levels	Control group				Acupressure group			
	Pretest		Posttest		Pretest		Posttest	
	N	%	n	%	n	%	N	%
None	0	0	0	0	1	3.3	0	0
Mild	6	20.0	23	76.6	7	23.3	29	96.7
Moderate	16	53.3	4	13.3	14	46.7	1	3.3
Severe	6	20.0	3	10.0	5	16.7	0	0
Great	2	6.7	0	0	3	10.0	0	0

n: number, %: percentage. None: 0, mild: 1-8, moderate: 9-16, severe: 17-24, and great: 25-32.

Table (3): comparison between pretest and posttest of nausea and vomiting status among patients with cholecystectomy using RINVR scale

Group		Mean	S.D	Independent Samples Test	
				T	p- value
Control group	Pretest	3.13	.819	4.163	.043
	Posttest	2.33	.661		
Acupressure group	Pretest	1.97	.183	9.352	.000

Table (4): Comparisons between differences of nausea and vomiting status among patients with cholecystectomy in groups using RINVR scale

Scale	Comparison between groups		Mean Difference (I-J)	p- value
	I	J		
RINVR scale	Control group	Acupressure group	1.300	.000

Table (5): association between improvement of nausea and vomiting and Demographic characteristics and clinical data of patients after using acupressure therapy.

Demographic characteristics and clinical data		Mean	S.D	One way ANOVA test	
				F	p- value
Age	< 20 years	1.00	.000	.270	.847
	20- 39 years	1.06	.250		
	40- 59 years	1.00	.000		
	≥ 60 years	1.00	.000		
Educational level	Illiterate	1.00	.000	.799	.537
	Educated	1.00	.000		
	Primarily	1.14	.378		
	Intermediate	1.00	.000		
	Institute	1.00	.000		
	Collage And More	1.00	.000		
Occupational status	Retired	0	.000	.204	.893
	Housewife	1.06	.236		
	Government employee	1.00	.000		
	Unemployed	1.00	.000		
	Free business	1.00	.000		
BMI	Normal	1.00	.000	1.387	.269
	Over weight	1.00	.000		
	Obesity class I	1.00	.000		
	Obesity class II	1.17	.408		
	Obesity class III	1.00	.000		
				Independent Samples Test	
				T	p- value
Sex	Male	2.43	.787	.429	.671
	Female	2.30	.635		
Are you a smoker?	Yes	2.42	.669	.557	.582
	No	2.28	.669		