Faculty of Nursing

Obstetrics& Gynecologic Nursing Department

Protocol for postdoctoral research

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.

Title:

In English:

Effect Of Trendelenburg Position, Warm Pad Application and Deep Breathing Exercise on Shoulder Pain and Post Gynecologic Laparoscopic Recovery

Keywords: Trendelenburg position, Warm Pad, Breathing exercise, Gynecologic laparoscopy, shoulder pain, postoperative recovery.

INTRODUCTION

Laparoscopic gynecologic surgery has evolved from a limited surgical procedure used only for diagnostic purposes to a major surgical approach for treating a multitude of malignant and non-malignant pathologies. It is currently considered one of the most common surgical procedures performed by gynecologists.(**Zeein et al., 2020**) . Laparoscopic surgery, has become widely recognized as a viable alternative to traditional laparotomy in treatment of different gynecologic diseases (**Hsuan et al., 2019**). The advantages of laparoscopic surgery over traditional laparotomy include a smaller surgical wound, less postoperative pain, a shorter hospital stay, faster recovery, and a better cosmetic result. (**chen et al., 2011**). However, post-laparoscopic shoulder pain (PLSP), is a prevalent complaint following laparoscopic surgery with an incidence as high as 80%. The pain can be severe and is usually relieved in 24–48h, but rarely persists for over 72h after surgery. It has also been found that PLSP is less responsive to treatment than incision and visceral pain **(Kiyak, 2019**).

The precise mechanism of post-laparoscopic shoulder pain remains unclear. Carbon dioxide accumulation and phrenic nerve irritation as a result of diaphragmatic stretching are the most accepted explanations(**Phelps, 2008**). A number of techniques that are proposed to diminish shoulder pain as intraperitoneal instillation of local anesthetics, pulmonary recruitment maneuver, warm and humidified dioxide, low pressure pneumoperitoneum and intraperitoneal normal saline infusion. Unfortunately, these interventions have often found quite varied and sometimes even conflicting results regarding their effectiveness (**Tian, 2021).**

Optimal pain management is imperative for the success of immediate and long term rehabilitation. Therefore, relieving PLSP is a problem that can no longer be ignored. Effective pain control is best achieved through a combination of both pharmaceutical and non-pharmaceutical therapies. Non pharmacological methods increase women/Patient control of her feeling, improve the activity level and functional capacity and reduce dosage of analgesic drugs thus decreasing the side effects of treatment (**Metawie et al.,2015).**

One of the popular non-pharmacological techniques is heat therapy, it is easy to use, inexpensive, require no prior practice, and have minimal side effects when used properly. In addition to being used for pain relief, heat is used to relieve chills or trembling, decrease joint stiffness, reduce muscle spasm, and increase connective tissue extensibility (**Mohamed & Elhady, 2016).**

Also, one of the recommended non-pharmacological actions is to use deep breathing relaxation techniques. The technique of breathing relaxation itself is an act of nursing care, which in this case the nurse teaches the patients how to do deep breathing techniques, slow breathing (hold inspiration to the maximum) and how to exhale slowly. In addition to reducing pain intensity, deep breathing relaxation techniques can also improve lung ventilation and increase blood oxygenation **(Asman & Maifita, 2019).**

In addition, the trendelenburg position might decrease shoulder pain by reducing the mechanical pressure exerted by CO2 on the diaphragm and the upper abdominal muscles. CO2, known for its high solubility, would also be displaced to the pelvis that has a rich vasculature which in turn speeds up the resorption of pneumoperitoneum **(Zeein et al., 2020)**. However, evidence-based research is still needed in the area of pain relief after gynecologic laparoscopy and few studies have attempted to identify the effect of warm application and trendelenburg position versus deep breathing technique on PLSP. So, the purpose of this study is to determine the effect of postoperative trendelenburg position, warm application, and deep breathing exercise on shoulder pain

AIM OF THE STUDY

The present study aims to:

investigate the effect of postoperative trendelenburg position versus warm pad application and deep breathing technique on shoulder pain intensity and post gynaecologic laparoscopic recovery

Hypothesis

- Women who assume trendelenburg position after gynecological laparoscopic surgery exhibit less shoulder pain intensity and high quality postoperative recovery than those who receive warm application and who perform deep breathing technique.

- Women who receive warm pad application after gynecological laparoscopic surgery exhibit less shoulder pain intensity and high-quality postoperative recovery than those who assume trendelenburg position and who perform deep breathing technique.

- Women who perform deep breathing technique after gynecological laparoscopic surgery exhibit less shoulder pain intensity and high-quality postoperative recovery than those who assume trendelenburg position and who receive warm application.

PLAN OF THE STUDY

MATERIALS AND METHOD

Materials

Research design:

A comparative quasi-experimental research design will be utilized in this study, where the effect of three independent variables (Trendelenburg position, heating pad and deep breathing technique on two dependent variables (shoulder pain and post gynecologic laparoscopic recovery) will be examined in this study.

Setting:

This study will be conducted in the laparoscopic unit at El Shatby Maternity University Hospital in Alexandria Governorate, Egypt. This hospital was particularly chosen because the turnover of gynecologic laparoscopy is suitable for the study and the women attending this hospital have nearly the same socio-economic status which maintain homogeneity of the study sample

Subjects:

A convenient sample of 90 women attending the previously mentioned setting will be recruited. The Epi info 7 program version 10 was used to estimate the sample size using the following parameters; Population size= (1000) over 3months, Expected frequency 50%, Acceptable error of 5%, and Confidence coefficient 95%. The minimum sample size 84

women will be selected according to the following criteria:

- Age from 18-70 years
- who were scheduled for diagnostic or operative gynecological laparoscopic surgery for non-malignant pathologies (e.g., hysterectomy, myomectomy, ovarian

cystectomy)

- Free from any medical or gynecological risk factors such as, morbid obesity (BMI > 45). Medical history of deep vein thrombosis, rupture of ectopic pregnancy, rupture of an ovarian cyst, shoulder surgery and chronic shoulder pain.

Sampling technique: The selected subjects were assigned to one of the following two groups:

- Study group 1 included 30 women, who will assume the trendelenburg position.
- Study group 2 involved 30 women, who will receive the warm pad on shoulder
- Study group 3 included 30 women who will perform deep breathing technique

Tools:

Three tools will be developed and used by researcher to collect the necessary data as following:

Tool (I): woman's Socio-demographic and Clinical Data Structured Interview Schedule

This tool will be developed by the researcher. It entails the following two sections:

Part (I): Socio-demographic characteristics such as: the subjects' age, level of education and occupation. In addition to her marital status, residence, family type and income etc.-----.

Part (II): Profile of current gynecologic surgery including: name, date, duration, reason for surgery and postoperative complaint.

Tool (II): Postoperative Quality of Recovery scale(QoR40)

This tool was originally developed by Myles (2000), **(Myles et al., 2000)** it is used to measure quality of recovery. It is consisted of 40 items, the items are grouped according to various aspects (dimensions) of recovery: emotional state (9items), physical comfort (12items), psychological support (7items), physical independence (5 items), and pain (7items). Subjects' response to each item will vary according to a 5 point likert scale, it was scored for positive item as "1= none of the time, 2=some of the time, 3= usually,4=most of time, and 5=all of the time. For negative items the scoring will be reversed.

Total score of QoR scale will range from (40- 200) scores, the total quality of recovery score was calculated as the following:-

Low quality of recovery----------< 60% of total quality of recovery scores (< 120 scores). Moderate quality of recovery ------60-75% of total quality of recovery scores (< 120-150 scores). High quality of recovery -------->75% of total quality of recovery scores (> 150-scores).

Tool (III): Numerical Pain Rating Scale (NRS)

This tool will be adapted from the Clinical Manual for Nursing Practice (McCaffery, M. and Beebe, A. ,1993) **(McCaffery& Beebe.,1993).** It will be used to assess the severity of shoulder pain. Women will be instructed to choose a number from 0 to 10 that best describes their current pain. 0 means "No pain" and 10 means sever pain'. It was scored as no pain (0), mild pain (1-3), moderate (4-7), and sever pain (8-10).

METHOD

The study will be accomplished according to the following steps:

1. An official approval will be obtained from the Research Ethics Committee, Faculty of Nursing, Alexandria University. An official letters from the Faculty of Nursing, Alexandria University will be directed to the responsible authorities of the study settings to obtain the permission to collect data after explaining the study purpose.
2. Tool (I) will be developed by the researcher after thorough review of recent& relevant literature.
3. Tool (II, III) will be adapted and translate into Arabic language to suite Egypt culture.
4. Tools will be tested for content validity by a jury of 5 experts in Obstetrics and Mental health fields.
5. Tools will be tested for their reliability by using the appropriate test.
6. A pilot study will be carried out on 9 women; to test the feasibility of the study as well as to ascertain the clarity and applicability of the tools in addition to calculate the time needed to complete them. (This number will be excluded from the study).

7. Each woman in the two groups will be individually interviewed during the preoperative period to collect basic data using tool I.
8. Again, for women undergoing the present study, the researchers will reassure that they have the same technique of surgery, doses of anesthetic drugs, and intra-operative measures to drain CO2 gas from the abdominal wall .
9. The subjects will be assigned to one of 3 groups as follows:

- **Group 1** (trendlenburg position group) in which the women will be positioned in a Trendelenburg position (20 °) once fully awake and cooperative in the recovery room and will remain in this posture for the first 24 hrs postoperatively. The maximum time allowed in a straight-up position will be three 15-min intervals over a 24-h period.
- **Group 2** (warm pad application group) in this group warm pad (38◦C -40◦C) will be applied on the shoulder after four hours postoperatively for a period of 5-10 minutes. Each woman will be asked to place heat pads when needed during the first 24 hours.
- **Group 3**: (deep breathing group) the researcher will instruct women after the end of surgery and upon consciousness to take slowly deep breathing while observing her chest and hold her breath for about 5 seconds and then exhale slowly, repeating this deep breathing technique five times after full vigilance within the first 3 hours after surgery. Then, the process will be repeated 6, 12, and 24 h later. The patient will be instructed about this type of breathing before surgery by researchers.

10. Pain intensity will be evaluated for all groups 4 times: at arrival to recovery room, & 4, 6, 12 and 24 hours postoperatively using tool III.
11. postoperative recovery will be evaluated for all groups after 24 h postoperatively using tool II
12. Comparison between all groups will be done to determine which intervention induces less shoulder pain and improve in postoperative recovery.

Ethical considerations:

For each recruited subject the following issues will be considered:

- Written informed consent will be obtained from women before data collection after explanation of the study aim.
- Privacy of women will be maintained during data collection processes.
- Confidentiality of data will be maintained during the execution of the study.
- Women's anonymity will be maintained during the execution of the study.
- Women will be informed that their participation in the study is voluntary, and they can withdraw at any time.

RESULTS

Analysis of data will be carried out by the researcher with the help of a statistical specialist. The collected data will be categorized, coded, computerized, tabulated and analyzed, using SPSS program.

DISCUSSION

The obtained findings will be explained and compared to current related literature and recent researches in the field.

CONCLUSION AND RECOMMENDATIONS

Conclusion and recommendations will be derived from the findings of the study.

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