The Effect of Pectoralis Major Block type 1 (PECS 1) on intraoperative general anesthetic requirements and postoperative analgesic requirements for breast cancer patients Undergoing Mastectomy

Thesis

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List of Abbreviations

Abb.	Full term
ACS	American cancer society
ACTH	Adrenocorticotrophic hormone
ADH	Antidiuretic hormone
AVP	Arginine vasopressin
BCS	Breast cancer surgery
BPI	The brief pain inventory
CNS	Central nervous system
Cox	Cyclooxygenase
CRH	Corticotrophin-releasing hormone
DVT	Deep venous thrombosis
FSH	Follicle stimulating hormone
GA	General anesthesia
IL	Interleukins
LH	Lutinizing hormone
MAC	Minimal alveolar concentration
MAC	Monitored anesthesia care
NPRS	The numerical pain rating scale
PECSB	Pectoralis major block
PG	Prostaglandins
PONV	Postoperative nausea and vomiting
SSR	Surgical stress response
TIVA	Total intravenous anesthesia
TPVB	Thoracic paravertebral block
TSH	Thyroid stimulating hormone
VAS	Visual analogue scale
VRS	The verbal rating scale

INTRODUCTION

Breast cancer is the top cancer in women both in the developed and the developing world. The incidence of breast cancer is increasing in the developing world due to increase life expectancy, increase urbanization and adoption of western lifestyles ***(Anderson et al., 2008).***

According to the American Cancer Society (ACS), breast cancer makes up 25 percent of all new cancer diagnoses in women globally. In 2012, nearly 1.7 million new cases were diagnosed worldwide. Survival rates vary worldwide but are improving overall. In countries with advanced care, the rate is 80 to 90 percent for those with a first-stage diagnosis, and 24 percent if diagnosis occurs at a later stage ***(American Cancer Society, Cancer Facts & Figures 2018).***

Breast cancer is not always a systemic disease, and mastectomy has cured a significant number of patients ***(Osborne et al., 1990).***

In describing how patients feel after surgery, Armitage stated that "slapping the patient on the face and telling him or her that it's all over is a complete inversion of the truth" because as far as the patient is concerned, "it is often just the beginning." Although the current armamentarium of analgesic drugs and techniques is impressive, effective management of postoperative pain still poses some unique challenges in the

ambulatory setting. The increasing number and complexity of operations being performed on an outpatient basis has presented anesthesia practitioners with new challenges with respect to acute pain management. Outpatients undergoing day-care procedures require a perioperative analgesic technique that is effective, has minimal side effects, is intrinsically safe, and can be easily managed away from the hospital or surgery center ***(Armitage, 1989).***

Peripheral nerve blocks and wound infiltration with local anesthetics are commonly used adjuvants to both monitored anesthesia care (MAC) and general anesthetic techniques because they can provide intra- and postoperative analgesia.More effective pain relief in the early postoperative period from the residual sensory block provided by regional anesthesia can facilitate the recovery process, enabling earlier ambulation and discharge home (i.e., fast-tracking). The use of regional anesthetic techniques also decreases the incidence of postoperative nausea and vomiting and thereby decreases the incidence of prolonged recovery stays and unanticipated hospital admissions related to intractable emetic symptoms. Although additional clinical studies are needed to identify the most cost-effective anesthetic techniques for ambulatory surgery, it would seem that peripheral nerve blocks with sedation (i.e., MAC techniques) offer significant advantages over central neuraxis blockade and general anesthesia in the ambulatory setting ***(Vloka et al., 1997).***

Although the primary role of the stress response after surgery is to augment the healing process, either overactivity or underactivity of host-defense mechanisms paradoxically may lead to negative consequences. For instance, the surgical stress response may provide optimal conditions for persistence of residual minimal malignant disease after surgery. Surgery has been suggested to accelerate the development of preexisting micro metastases and to promote the establishment of new metastases ***(Ben-Eliyahu, 2003).***

A wealth of basic science data supports the hypothesis that the surgical stress response increases the likelihood of cancer dissemination and metastasis during and after cancer surgery. Anesthesia might decrease recurrence after cancer surgery. Other factors such as blood transfusion, temperature regulation, and statin administration may also affect long-term outcome ***(Gottschalk et al., 2010).***

Regional anesthesia reduces the stress response caused by surgery, which is believed to be a mediator of postoperative immunosuppression. Regional anesthesia attenuates the surgical stress response by blocking afferent neural transmission. This prevents noxious afferent input from reaching the central nervous system ***(Liu et al., 2004).***

Most regional anesthesia in breast surgeries is performed as postoperative pain management under general anesthesia, and not as the primary anesthesia. Regional anesthesia has very

few cardiovascular or pulmonary side-effects, as compared with general anesthesia ***(Moon et al, 2017)*.**

Regional anesthesia techniques, such as thoracic epidural block, thoracic paravertebral block (TPVB), and intercostal nerve block, have been used in anesthesia and/or analgesia in breast surgery. However, these invasive regional techniques lead to some complications during the perioperative period; therefore, they are not appropriate on a day-stay basis ***(Moon et al, 2017).***

The pectoral nerves block (Pecs block) is a novel superficial nerve block, alternative to neuraxial and paravertebral blocks, which provides good analgesia during and after ambulatory breast surgery. Pecs block has been performed as postoperative pain management and not as a primary anesthesia in breast surgeries under general anesthesia (GA). However, when conducted in combination with monitored anesthesia care (MAC), it could suffice as primary anesthesia. Pectoral nerve block is a relatively new technique, with fewer complications than other regional anesthesia ***(Moon et al, 2017)*.**

Aim of the Work

In a selected category of patients undergoing mastectomy for breast cancer, we compare the intraoperative anesthetic requirements and postoperative analgesic requirements in patients receiving PECS block type I besides general mode of anesthesia, to patients undergoing general mode of anesthesia, hence assessing the anesthetic and analgesic role of PECS block type I in mastectomy. Thus, the capability of PECS block type 1 of providing a good coverage for surgical incisions involving cancer breast simple mastectomies shall be targeted as well.