بسم الله الرحمن الرحيم

MONA MAGHRABY

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

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علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

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MONA MAGHRABY

Pectoral Nerves Blocks for Post-operative Analgesia after Breast Cancer Surgery

Thesis

Submitted For Partial Fulfillment
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Omar Fathy Shatoury Younis

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List of Abbreviations

Abb.	Full term

AAGBI ..... *Association of Anesthetists of Great Britian and Irland*

ASA ..... *American Society of Anesthesiologists*

BMI ..... *Body Mass Index*

CNS ..... *Central nervous system*

DVT ..... *Deep vein thrombosis*

IASP ..... *International Association for study of pain*

LA ..... *Local anesthetic*

LD ..... *Latissumus dorsi*

NRS ..... *Numeric rating scale*

PACU ..... *Post anesthetic care unit*

Pecs ..... *Pectoral nerve block*

PMm ..... *Pectoralis major muscle*

Pmm ..... *Pectoralis minor muscle*

PONV ..... *Post operative nausea and vomiting*

SAm ..... *Serratus anterior muscle*

SIPB ..... *Serratus intercostal plane block*

TPVB ..... *Thoracic paravertebral block*

VAS ..... *Visual analogue scale*

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INTRODUCTION

Breast cancer is a major health burden worldwide. According to the latest report of The International Agency for Research on Cancer (GLOBOCAN 2012), breast cancer is the world's most common cancer among women, and the most likely cause of death worldwide. The age-specific incidence rates in Egypt show a progressive increase after the age of 30 years, to reach a sharp peak at the age group of 60-64 years ***(Azim et al., 2014).***

The main treatments for breast cancer are surgery, radiotherapy, chemotherapy, hormonal therapy and biological therapy. The type and the combination of treatments depend on the type of the cancer and its stage. Surgery is usually the first choice of treatment for breast cancer ***(Maughan et al., 2010).***

After breast surgeries acute postoperative pain may occurs significantly and it may progress to chronic pain ***(Bashandy et al., 2015).***

Unfortunately, even after adequate treatment, some patients experience severe pain either due to disease progression or due to treatment related side effects. The persistent pain causes a negative physical and psychosocial impact on patients' lives. Usually adequate analgesia is achieved by adopting the WHO's three steps analgesic ladder. As the disease progresses, the pain experienced by the patient

also increases. This necessates the administration of opioids and adjuvant analgesics to the breast cancer patients experiencing severe pain. However, opioid use is associated with intolerable side effects like constipation, nausea, vomiting, fear of dependence, and tolerance. Concomitant medications are required to combat these unacceptable side effects. Adjuvant analgesics need to be added to provide adequate and satisfactory analgesia. These factors worsen the psychological state of patients and deteriorate their quality of life. Hence, there is a need to develop therapeutic modalities to provide adequate analgesia with minimum side effects ***(Handy et al., 2011).***

Postoperative pain:

Pain is defined by the International Association for study of pain (IASP) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage ***(Loeser et al., 2008).***

Postoperative pain often is characterized as acute nociceptive pain and the neuropathic pain may be associated with excessive stretching of or direct trauma to peripheral nerves ***(Hartrick et al., 2004).***

Acute pain is the normal predictable neurophysiologic response to noxious mechanical, thermal, or chemical stimuli which is carried to the higher brain center by receptors and

neurons. It is generally time-limited, and decreases with the cessation of the noxious stimuli. This pain sensation is usually limited to the area of trauma or damage or to the area that immediately surrounds it. The painful sensations associated with such an injury are expected to resolve over time when adequate wound healing has occurred. In contrast, chronic pain persists beyond either the course of an acute injury or illness or its expected time for healing and repair and it is defined as pain persisting greater than six months after surgery ***(Fishman et al., 2012).***

Although pain is a predictable part of the postoperative experience, inadequate management of pain is common. Unrelieved postoperative pain may result in clinical and psychological changes that increase morbidity and mortality as well as costs and that decrease quality of life ***(Apfelbaum et al., 2003).***

Ineffective post operative pain management may leads to:

- Development of chronic post mastectomy pain which is associated with impaired quality of life in 50% of the patients undergoes breast surgeries. Specific early analgesic interventions may reduce the incidence of chronic pain after surgery. The development of chronic post-mastectomy pain is a complex process. It may be referred to nerve injury and associated ectopic neural activity which leads to neuropathic pain. In addition, inflammatory and immune reactions after axonal damage release neurotransmitters which act locally

and in the spinal cord to produce hypersensitivity. In turn, central sensitization is developed and characterized by heightened dorsal horn neural activity and amplification of sensory flow. It may alter central nervous system function and structure ***(Kehlet et al., 2006).***

- Limitation of the movement of the thoracic and abdominal muscles and this may cause some degree of respiratory dysfunction with secretions and sputum being retained because of a reluctance to cough and may be followed by atelectasis and pneumonia ***(D'Arcy et al., 2013).***

- Increase sympathetic nervous system activity which, in turn, increases heart rate, blood pressure and peripheral vascular resistance that increase the oxygen consumption of the myocardium. When oxygen consumption is greater than oxygen supply, myocardial ischemia and myocardial infarction mayoccur ***(Macintyre et al., 2001; Warltier et al., 2000).***

- Psychological factors that influence the experience of pain include the processes of attention, cognitive processes, behavioral responses, and interactions with the person's environment ***(Mayes et al., 2007).***

- Suppression of immune function by the surgical stress response and by increasing the need for opioids. Opioids, especially morphine, inhibit both cellular and humoral immune functions ***(Sessler et al., 2014).***

- Increase cortisol, antidiuretic hormone, and catecholamines, decrease insulin, hyperglycemia, glucose intolerance and retention of water and sodium ***(Kehlet et al., 2003).***

- Untreated pain may cause reduction in fibrinolysis, increase platelets activity and activation of coagulation cascade may increases the risk of deep vein thrombosis (DVT) and pulmonary embolism ***(McCaffery et al., 1999).***

- Delayed gastric emptying and reduced bowel motility increase the potential for the development of paralytic ileus ***(Baig et al., 2004).***

Pain assessment helps to determine whether pain management is adequate, whether analgesic drugs or analgesic dose changes are required and whether changes in the postoperative pain management plan or additional interventions are needed ***(Chou et al., 2016).***

The evaluation of pain after surgery is complex. The visual analogue scale (VAS) and numeric rating scale (NRS) for assessment of pain intensity are equally sensitive in assessing acute pain in adults after surgery ***(Reich et al., 2016) (Fig1)***

The studies suggest that the reliability of the VAS for acute pain measurement appears to be high ***(Bijur et al., 2001).***

The Visual Analogue Scale (VAS) was first used in psychology by Freyd in 1923.(VAS) consists of a straight line of 10 cm length with two end point representing the extreme limits such as ‘no pain at all’ and ‘pain as bad as it could be’. The patient is asked to mark his pain level on the line between the two end points. The distance between the two end points defines as the subject’s pain. The advantages of (VAS) are it can be used positively with other self-reporting measures of pain intensity. Also when pain intensity measured at two different points of time by VAS, it represents the real difference in the magnitude of pain which seems to be a major advantage of this tool compared to others. But the VAS as disadvantage seems to be more difficult to understand than other measurement methods and more susceptible to misinterpretations. In conclusion, VAS is valuable instruments to assess pain intensity and changes due to therapy when respondents are given good instructions ***(Haefeli et al., 2006).***

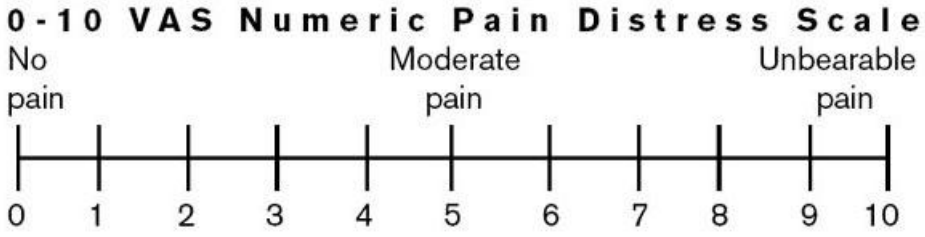

Fig. 1: Visual analogue scale **(*Breivik et al., 2016)***