Applied Nursing Research 33 (2017) 121–126

Contents lists available at ScienceDirect

Applied Nursing Research

journal homepage: www.elsevier.com/locate/apnr

The effect of standard pain assessment on pain and analgesic consumption amount in patients undergoing arthroscopic shoulder surgery

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ARTICLE INFO

Article history:
Received 9 August 2016
Accepted 12 November 2016

Keywords:
Postoperative pain
Pain assessment protocol
Analgesic consumption
Pain management
Orthopedic nursing

ABSTRACT

Pain assessment has a key role in relief of the postoperative pain. In this study, we aimed to examine the effect of the Standard Pain Assessment Protocol (SPAP), which we developed based on acute pain guidelines, on pain level, and analgesic consumption. The study population consisted of a total of 101 patients who had arthroscopic shoulder surgery. The routine pain assessment was administered to the control group, while the SPAP was administered to the study group. The routine pain therapy of the clinic was administered to the subjects from both groups based on the pain assessment. Throughout the study, pain was assessed nearly two times more in the study group ($p < 0.001$) and the mean pain levels were lower at 8th–11th hours in the study group ($p < 0.001$). Pain assessment was not performed after 12th hour despite the severe pain in the control group, and, therefore, analgesia was administered at irregular intervals or was not administered at all. However, the hours of analgesic administration were found to be more regular according to the pain levels of the patients in the study group. In conclusion, the SPAP reduced the pain level by providing regular analgesia when used in combination with regular pain assessment.

Perspective: This article highlights the appropriate assessment for patients with surgical pain. In majority of literature on the subject, the authors emphasize the importance of Standard Pain Assessment Protocol to provide adequate pain relief.

1. Introduction

Upper extremity surgeries are among major surgical interventions which may cause severe pain in the postoperative period (Beecroft & Coventry, 2008; Fredrickson, Krishnan, & Chen, 2010; Sommer et al., 2008). They are also associated with increased severe pain-related complications (atelectasis, hypertension, deep vein thrombosis, etc.), opioid requirement and opioid-related side effects (respiratory depression, nausea, vomiting, constipation, etc.), and hospital admission after discharge (Fredrickson et al., 2010; Fortier, Chung, & Su, 1998). A study investigating the postoperative pain experiences of patients showed that 96.4% of the patients had difficulties in cough, 78.3% in movement, and 46.7% in breathing due to postoperative pain (Yılmaz & Gürler, 2011). Another study, which was conducted with 15.172 ambulatory surgery patients, reported that 12% of the patients were re-admitted to the hospital due to pain, 60% of these presenting patients were orthopedic surgery patients, and this resulted from postoperative insufficient pain management (Fortier et al., 1998).

A cohort study with 50.523 patients in 105 German hospitals demonstrated that the highest pain score was in orthopedic surgery clinics and the pain expected to be in mild to moderate levels were expressed as severe pain by the patients (Gerbershagen et al., 2013). The study highlighted that regardless of the surgery type and analgesia, the pain could be more severe than expected, and, therefore, it should be frequently and periodically assessed for the management (Gerbershagen et al., 2013). A meta-analysis (2011) investigating the frequency of pain assessment during postoperative movement established that the pain was assessed only in 39% of the studies and the assessment time was not clear in certain studies. Pain would be more severe during movement than it is at rest, and this would create differences in pain results. Researchers have recommended to specify and standardize the

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http://dx.doi.org/10.1016/j.apnr.2016.11.009
0897-1897/

pain assessment times (movement and/or rest) to remove such differences (Srikandarajah & Gilron, 2011).

The assessment of pain is a critical step for providing good pain management. In the April 2016 report, JCAHO emphasizes that comprehensive pain assessment and reassessment of the pain (Joint Commission Statement on Pain Management, 2016). In the literature, randomized-controlled studies report that pain should be properly assessed for an efficient pain management (Dewar, 2006; Schofield, O'Mahony, Collett, & Potter, 2008; Silva, Pimenta, & Cruz Dde, 2013). Wells, Pasero, and McCaffery (2008) found that the lack of pain assessment was one of the most problematic barriers to achieve improved pain control (Wells et al., 2008). Pain management guidelines have been developed for an effective pain management in the postoperative period (Agency for Health Care Policy and Research (AHCPR), 1992; American Society of Perianesthesia Nurses (ASPAN), 2003; Clinical Practice Guideline for the Management of Postoperative Pain, 2002; JCAHO, 2001). Such guidelines include recommendations for standard pain assessment and treatment which cover pre- and postoperative periods, and highlight that each hospital should formulate its own protocol based on these recommendations (Agency for Health Care Policy and Research (AHCPR), 1992; American Society of Perianesthesia Nurses (ASPAN), 2003; Clinical Practice Guideline for the Management of Postoperative Pain, 2002; Joint Commission Statement on Pain Management, 2016). Recently, the American Pain Society using the data of the American Society of Anesthesiologists commissioned an interdisciplinary expert panel and developed a clinical practice guideline to promote an evidence-based, effective, and a safer postoperative pain management in children and adults (Chou et al., 2016).

There is a few number of studies examining the effect of standard pain assessment on pain and analgesic consumption in the literature (Silva et al., 2013; Harmer & Davies, 1998). In addition, the number of studies on pain of shoulder surgery patients is also limited (Brown, 2008). A study evaluating the efficacy of treatment-based on acute pain protocol found decreased rates of patients with moderate to severe pain, when the protocol was applied (Sommer et al., 2008). In another study, the authors reported significantly reduced postoperative pain and morphine consumption in patients for whom standard and routine pain assessments were performed by nurses (Silva et al., 2013). Although the protocols emphasize the importance of standard pain assessment, our observations and the literature data suggest that pain assessment scales are not effectively used in clinical practice, and there is no periodical assessment and there is no adequate recording system for pain assessment at hospitals (Erden, Akcali, Bulut, & Babacan, 2015; Yılmaz & Gürler, 2011; Yuceer, 2011). In a study which was conducted in Turkey with 360 surgical patients in 2011, all patients reported that nurses did not use any form to measure the pain level, only 11.4% of the patients had expectations from the nurses toward pain relief, and 36.6% of these patients asked nurses to check the pain more frequently after the operation (Yılmaz & Gürler, 2011).

Pain assessment is also guiding in determining the optimum analgesic dose and administration frequency (Faydalı, 2010). For an effective postoperative pain management, a routine and standard pain assessment which guides the option of analgesia and also measures the efficacy of analgesia should be performed (Gerbershagen et al., 2013; Yuceer, 2011). Previous studies have shown that pain assessment based on acute pain protocols enhances pain awareness and pain management (Karlsten, Ström, & Gunningberg, 2005; Silva et al., 2013; Sommer et al., 2008). The clinical practice guideline of the Agency for Health Care Policy and Research and the Joint Commission on Accreditation for Healthcare Organizations publish the following suggestions for postoperative pain assessment: (Agency for Health Care Policy and Research (AHCPR), 1992; Joint Commission Statement on Pain Management, 2016; JCAHO, 2001)

- Informing the patient and his/her family on the pain assessment (pain scale, pain assessment frequency, etc.),
- Selecting a valid, reliable, and a commonly used pain scale (Verbal or Numerical Pain Scale, Visual Analogue Scale, etc.) prior to the operation and using this scale after the operation,
- Determining the pain level only by a self-rated scale filled by the patient,
- Allowing patient to express his/her pain, determining the pain-reducing and increasing factors,
- Measuring the pain level routinely (within the first 24 h, once in 2 h, once in four to 8 h, once in shift, etc.) after the operation as a vital sign,
- Measuring the pain both at rest and during activity (cough, mobilization, etc.),
- Assessing the pain after every analgesic administration (30 min after parenteral analgesia, 1 h after oral analgesia/non-pharmacological analgesia), and
- Recording the pain level and analgesic practices performed.

In accordance with the specified recommendations, each hospital should formulate its own pain protocols and properly assess the pain. In this study, Standard Pain Assessment Protocol (SPAP) was developed by the researchers considering the recommendations of available guidelines. This protocol involves organized and standard practices in several aspects from pain scale to the assessment frequency.

In this study, we aimed to examine the effect of the SPAP on pain and analgesic consumption amount in patients undergoing arthroscopic shoulder surgery.

2. Methods

2.1. Study design and participants

This study was conducted as an interventional research on patients who had arthroscopic shoulder surgery at Gazi University Health Practice and Research Center Orthopedics and Traumatology Clinic.

The study population consisted of patients who had arthroscopic shoulder surgery in the Orthopedics and Traumatology Clinic of the hospital. The mean number of shoulder surgery performed at the hospital is 250. Of these 250 patients, 101 patients met the inclusion criteria. The study population consisted of a total of 101 underwent arthroscopic shoulder surgery patients (study group, $n = 51$; control group, $n = 50$) aged above 18, who had no operations within the past six months, no orthopedic surgery within the past one year for any reason, had the first shoulder surgery, and gave a consent to participate in the study. Patients who did not meet these criteria were excluded. The patients were randomly selected for the study and control groups. Randomization was performed according to the surgery date to prevent any interaction among the patients. The patients with an odd number of surgery date were included in the control group, while those with even numbers were included in the study group.

2.2. Procedures

There is not any pain assessment protocol applied to orthopedics and traumatology patients in the clinic where the study was conducted. The patients undergoing arthroscopic shoulder surgery are admitted to the clinic on the surgery day and discharged on postoperative day one. The pain of the patient is assessed at varying intervals on the surgery day and in the subsequent periods. The analgesic treatment of the patients following arthroscopic shoulder surgery includes tenoxicam (20 mg, bid, intravenous), diclofenac sodium (as needed, intramuscular), and Pethidine hydrochloride (as needed, intramuscular).

In our study, the operations of the control and study group patients were performed by the same team (orthopedist and anesthesia). Following the operation, the routine pain assessment and analgesic treatment of the clinic were administered to the control group patients. To the study group patients, SPAP which was developed by the researchers