AROUND THE CLOCK PAIN MANAGEMENT IN SURGICAL UNITS

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Abstract: Objective: The purpose of the study was to examine the relationship between the types of acute pain management (on demand (SOS) vs. around the clock (ATC)) and the quality of treatment for postoperative pain among patients hospitalized in a surgical department.

Subject and Methods: We conducted a cross-sectional study in a surgical division of an academic center from January 2014 until the end of April 2015 that included patients over the age of 18 who underwent surgery. Patients completed three questionnaires: pain assessment, pain management patterns, and patient education.

Results: The study included 172 patients with an average age of 53.2 ± 18.1 years. The majority (94%) had pain of magnitude over 4 on the VAS scale. About half (60%) reported that the pain affected their mobility or their sleep (50%). Half of the patients (54%) received pain relievers by muscle injections, and only 15% were given combined ATC and SOS analgesic treatment. Approximately a third (38%) did not receive any guidance on the possibility of receiving pain medication. There was a statistically significant difference in reported pain intensity between patients who received ATC versus SOS analgesics (X²=6.67, p=0.030).

Conclusions: ATC analgesic regimen for postoperative pain was better tolerated by patients. There is a need to establish a unique body that will coordinate and manage acute pain management in the hospitals.

Key words: postoperative pain management, patient education, quality of life.

Introduction

Pain assessment is the basis for effective treatment, including detection and active prevention of pain, with reference to the subjective verbal reporting of the patient. The standard scale used by patients is verbal analog scale (VAS), which ranges from 0, which refers to no pain, to 10.

Uncontrolled pain is a global health problem. Over 50% of patients after surgery or trauma suffer from an unbearably high level of pain. The post-operative pain experience is a personal subjective experience that is an inseparable part of post-operative recovery and therefore the issue of pain control is of great importance.

The relief from pain is a basic human right. Despite the various guidelines written to improve the quality of acute pain treatment, acute pain continues to be felt by many patients. Postoperative pain is perceived by both patients and caregivers as something to be tolerated and overcome. Effective treatment of acute pain was associated with preventing complications, shortening hospitalization, encouraging recovery, and reducing the risk of chronic pain syndrome.

Frequent assessment of pain intensity and pain behaviors by the nursing staff will enable them to make effective decisions about the treatment and transfer of effective information to physicians and nursing staff. Many factors influence the frequency and complexity of performing repeated pain estimates. In an acute pain situation, a repeated pain assessment should be performed within 30 minutes from parenteral analgesic administration, within an hour of oral analgesic administration, and any time a patient reports a change in pain or a new pain.

Various guidelines have been written to improve the quality of acute pain management. The most important of these is treatment around the clock (ATC). The goal of this regimen is to manage the patient's basal pain level and adjust it during the first 24 hours after surgical intervention. The ATC regimen ensures the constant presence of pain relieving drugs within the patient's body, thus reducing the pain intensity and its nadirs, reducing the amount of pain medication the patient consumes, as well as preventing undue pain.

Treatment with ATC regimen is associated with a reduction in the side effects of analgesics and postoperative analgesia. The ATC regimen guidelines require the provision of rescue doses to ensure patient pain relief to the maximum extent. The intramuscular delivery of ATC and the rescue dose should be avoided. Injections into the muscle are accompanied by pain and sometimes with quite a few complications, so the recommendation is to avoid giving pain relievers in this way.

Relief of suffering is first and foremost a moral and human duty. In addition, effective treatment of postoperative pain has been associated with preventing complications, shortening the duration of hospitalization, encouraging recovery, and reducing the risk of developing chronic
pain. Patient education is a procedure in which the patient receives information about the postoperative pain. Patient education should address the following issues: the importance of pain management, the tool for measuring pain, treatment options, how and when the patient must report his or her pain, and how the patient can be an active partner in the treatment, which improves the effectiveness of pain treatment and reduces the consumption of opiates. Working by standards, team training, and patient education are part of quality pain management.

The aim of this study is to examine the effect of different types of acute pain treatment on the quality of postoperative pain among hospitalized patients in a surgical department. We hypothesized that pain intensity among patients receiving ATC pain regimen will be lower compared with patients receiving on-demand regimen, and this in turn will be reflected in the reported degree of disturbance to daily activity.

Methods

Study design: A cross-sectional study.

Patients: We enrolled a convenience sample, which included men and women over the age of 18, undergoing surgery in the General Surgery/Orthopedics/Urology Departments at our Medical Center.

The research tool included three questionnaires: 1) The Brief Pain Inventory short form (BPIsf) developed by Cleveland in 1989, which measures the intensity of the patient’s pain during the last 24 hours and at the time of filling out the questionnaire, as well as the extent to which pain interferes with daily life. The questionnaire contains 12 items, with an 11-level (0-10) scale. The Cronbach’s alpha reliability of the pain intensity section is 0.81, and the level of pain disorder reliability is 0.81. 2) Medical Record Audit Tool, which measures the pain management patterns. This tool focuses on three topics: pain assessment, pain reliever orders, and pain management. It examines documentation of pain assessment by physicians and nurses, pain intensity, physicians’ orders for pain relievers, the actual treatment given, the methods and the frequency of administration of the treatment, and the use of drug combinations and non-pharmaceutical methods. 3) Patient education questionnaire. This questionnaire includes eleven questions related to postoperative pain patient education. This questionnaire Cronbach’s alpha reliability is 0.79.

Data analysis was described using frequency and percentage. Quantitative data was analyzed using averages and standard deviations, median and range. The data were described for the entire sample and separately for different types of treatment (SOS, ATC, and combination of the two methods). Comparison of qualitative data between groups was performed by Chi square test or Fisher's exact test, by adjustment. A comparison of serial data was performed using Wilcoxon rank sum test. The results were based on SPSS version 19, at a significance level of 5%.
Results

Between January 2014 and the end of April 2015 we recruited 172 patients, with a mean age of 53.2±18.1 years. Sixty percent of the participants were men. Less than half (46.4%) of the surgeries were elective. About one third (48, 27.9%) of patients underwent major surgery (such as hip or knee replacement, abdominal surgery), with 85% (41/48) of them having orders for SOS pain relief, and only 12.5% (6) had a combined order (ATC and SOS) compared to patients who underwent minor or moderate surgery (124), in which 79.6% were given orders for SOS pain medication, and only 16.7% (18) had a combined (ATC and SOS) order for pain medication (see Table 1).

Most patients (148, 86%) suffered from some degree of pain during the first 48 hours after surgery. The pain was rated on a 1-10 VAS scale. When patients described pain as being 'strong' it measured 7.1±2.2, 'moderate' measured 4.8±1.9, and 'light' measured 3.1±2.4. One-third of the subjects reported having moderate or strong pain most of the time from surgery to the time of completing the questionnaires, and 35% of all patients reported that pain relievers helped them to a very small or moderate extent. The pain interfered moderately (2.4±4.27) with deep breathing and coughing and at a higher level (2.9±6.3) for activity such as bed mobility, decreased sleep, sleep at night, and affecting mood. There was a statistically significant association between the worst pain intensity and all disturbances measured (t=4.55, p=0.008). In addition, a statistically significant positive correlation was found between those who reported the worst pain intensity of 7 and above and mobility problems in bed, sleep deprivation, and effect on mood (p=0.009, p=0.041, p=0.008, p=0.006, respectively). There was also a statistically significant relationship between the mean pain during hospitalization (according to the BPIsf questionnaire) and getting out of bed and the effect on sleep: (p=0.0000 and p=0.004, respectively). In addition, there was a statistically significant negative correlation between the influence of pain relievers and the effect of pain on the mobility in bed and on mood (p=0.008, p=0.023, respectively). In contrast to the recommendations, only 19.8% of patients were given orders for an ATC analgesic. Drug combinations from different categories (NSAID, Opioid, Non-Opioid) were seen in 78.5% of patients. In about half of patients (53%) orders were given to administer intramuscular pain relief, and in half of them (52.9%) it was in the form of pethidine.

There was a statistically significant difference in the mean pain intensity reported among patients who received ATC pain medication compared to patients who received it as SOS ($X^2=6.67$, p=0.03), as shown in Figure 1. In addition, there was a statistically significant difference (p=0.001) between the two groups in all measures of the effect of pain, including on mood, in favor of patients receiving ATC pain medication, as can be seen in Figure 2.
A substantial part (40%) of patients, regardless of the type of surgery, reported that they received no education whatsoever on the possibilities of receiving pain medication after surgery or what to do if the pain medication does not help, and only 13% of those who did receive education indicated that they received insufficient instructions needed for postoperative pain relievers.

There was a statistically significant negative correlation between patient education and pain intensity (p=0.011) as can be seen in Figure 3. In the other measures of pain or pain effect on quality of life, there was no statistically significant difference between those who were given pain education by the medical staff and those who werenot.

**Discussion**

The purpose of our study was to examine the relationship between the types of acute pain treatment regimens and the quality of postoperative pain among patients hospitalized in the surgical departments of our medical center. Assessing the quality of pain management is essential for improving treatment. There is a lack of uniformity in the literature in relation to measures that should be used to evaluate the quality of pain treatment. In some of the studies the treatment procedure was evaluated as a measure of the quality (types of medication, frequency of administration of drugs, frequency of pain assessment), and in others pain intensity was used as a measure of the quality of pain therapy. Some of the studies also considered patients' attitudes regarding pain and their satisfaction with pain management.

The current study compared the two types of treatment regimens (ATC vs. SOS) with respect to the quality of pain treatment, based on pain management patterns and patient education and its effect on pain intensity and quality of life. The main finding in our study was that there was a statistically significant difference in the reported pain intensity among patients who received ATC vs. SOS regimens in all pain scores. The finding corresponds with other studies done on ATC pain medication regimens, which ensure a daily therapeutic level, reduce pain intensity and pain fluctuations, reduce the amount of pain medication in addition to preventing unmeasured pain, reduce patients' anxiety, and improve their quality of life.\textsuperscript{1,5,8} The ordersregimens used for pain killers in our study were mainly SOS and not ATC. In addition, treatment patterns included intramuscular drug administration to more than half of patients, all of which were in contrast to the recommended guidelines for the treatment of postoperative pain. Chou et al.,\textsuperscript{6} Dahl et al.,\textsuperscript{9} and Nagi et al.\textsuperscript{10} found that intramuscular injections were used for 25-36% of patients in most medical centers in the United States and England, although it was contrary to recommendations. In our study, there was a statistically significant association between the mean pain intensity and the degree of disturbance to performing different
activities, especially mobility and effect on mood. Rawal found that untreated pain has negative physical and mental consequences for the patient. However, effective treatment of acute pain was associated with preventing complications, shortening hospitalization, encouraging recovery, and reducing the risk of chronic post-operative pain syndrome. Postoperative pain also affects the patient's ability to perform essential activities for his or her recovery. Gorden et al. found a significant association between the worst pain intensity and the degree of disturbance to various activities such as walking, deep breathing, and coughing. Mentally, acute pain is associated with anxiety, helplessness, difficulty falling asleep, a decline in mood, and a sense of helplessness. The additional cost associated with postoperative pain is attributed primarily to the prolongation of hospitalization. Relief from suffering is first and foremost a moral and human obligation. In addition, effective treatment of postoperative pain has been associated with preventing complications, shortening the duration of hospitalization, encouraging recovery, and reducing the risk of developing chronic pain.

In the present study, two-thirds of patients reported that they received pain-control education, which corresponds to recommendations for improving the quality of pain management and the call to educate patients and medical staff as core components in a nurse-based pain service model. Patient education before surgery is of great importance in reducing pre-surgery anxiety and increasing patients' satisfaction with the treatment of pain. Relating to patient's pain in an empathetic and caring manner was found to increase patient satisfaction, regardless of the intensity of their pain. A structured pain education allows for reference to the subject and allows the patient to report their pain and thus contributes to their satisfaction.

Many patients are not knowledgeable enough in the subject of pain in order to know what guidance they want or deserve. Therefore, in our study, 60% of patients found it difficult to rate the information they received regarding the information they needed. In addition, only 53.5% of patients who were instructed about pain were given explanation as to "what to do if the pain reliever does not help". This issue was not sufficiently emphasized during the pain education by the medical staff, in contrast to the literature recommending patients' sharing of the treatment options available to them and of the extent of training as an alternative measure of satisfaction with pain treatment.

In light of the results of our study, we see that the quality of treatment for postoperative pain is still lacking. There is a need for the use of postoperative pain management protocols, including ATCrescue treatment regimen and its assimilation among the medical staff, nurses and physicians alike. In addition, preoperative patient education on post-operative pain
management is important as part of actions to provide essential and quality treatment and preventing patients from suffering.

Study limitations: The limitation in our study is that the sample is a convenience sample, and the study population was from one medical center. In order to draw the appropriate conclusions for a larger population a multi-institutional study is warranted after implementation of national pain treatment protocols.

Conclusion

Pain experience is a personal subjective experience and an integral part of postoperative recovery, and therefore it is of utmost importance to control the pain. Despite increased focus on pain management programs and the development of new standards for pain management, many patients continue to experience intense pain after surgery. Effective and appropriate pain management requires a proactive approach through a variety of treatment methods in order to achieve optimal outcome in relation to relief and rapid recovery, and return to full function and rapid discharge from the hospital.

Clear policy, establishing standards, team training, and patient education are part of building a quality pain management system. The recommended method for constructing a system for treating acute pain in hospitals is the establishment of a unique body that will coordinate and manage different aspects of pain management in addition to assimilating recommended and evidence-based treatment regimens to improved outcomes.

Authors contribution: OR, SA, GA, RY, HS, HA, SH, NImade significant contribution to study concept and design, acquisition of data, or analysis and interpretation of data;

Drafting and revising the manuscript for important intellectual content; andapproval of the final version to be published.

References:


Figure 1: Mean and worst pain intensity in the study groups.

There was a statistically significant difference in the mean pain intensity reported among patients who received ATC pain medication compared to patients who received it as SOS ($X^2=6.67$, $p = 0.03$). Worst pain intensity is shown with black bars and mean pain intensity is shown with white bars.

SOS - on-demand; ATC - around the clock.
Figure 2: Effect of pain on patients' activities in the ATC and SOS groups. A statistically significant difference between the ATC (white bars) and SOS (black bars) groups was found in all measures of the effect of pain, in favor of patients receiving ATC pain medication (p = 0.001).

SOS - on-demand; ATC - around the clock

Figure 3: Pain education effect on pain intensity.
There was a statistically significant negative correlation between patient education and pain intensity (p = 0.011). Patients receiving pain education are represented in black columns and patients who did not receive pain education are represented in white columns.

Table 1. Number of patients according to type of surgery and pain medication regimen that was subscribed to them.

<table>
<thead>
<tr>
<th>Regimen</th>
<th>Major surgery [N (%)]</th>
<th>Minor or moderate surgery [N (%)]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>48 (27.9)</td>
<td>124 (72.1)</td>
</tr>
<tr>
<td>SOS</td>
<td>41 (85.4)</td>
<td>99 (79.8)</td>
</tr>
<tr>
<td>ATC</td>
<td>1 (2.1)</td>
<td>7 (5.7)</td>
</tr>
<tr>
<td>ATC+SOS</td>
<td>6 (12.5)</td>
<td>18 (14.5)</td>
</tr>
</tbody>
</table>

Most patients in both groups were on SOS pain medication regimen, rather than on combined ATC+SOS regimen. SOS - on-demand; ATC - around the clock.