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# Post-Laparotomy Pain: How to Achieve a Satisfactory Control

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## Abstract

**Objective:** The purpose of this study is to demonstrate how a better post-laparotomy pain control can be achieved by individually assessing patients' pain three times a day.

**Methods:** A prospective randomized study conducted in the General Surgery Department of a district hospital, from April to July 2019.

**Results:** A total of 20 post-laparotomy patients were analyzed. Patients were divided into two cohorts: Group A, pain score assessed three times a day and analgesia provided accordingly, Group B, usual practice patients (analgesia administered when asked by the patient) and pain score assessed as in Group A, over a four day period. Mean age was similar in both groups (70.5 ± 16.2 *vs*. 72.6 ± 11.5, p=0.74). Pain score assessed on Day 1 at 9 AM was 2.6 ± 1.07 *vs*. 2.4 ± 1.89, p=0.78, pain score assessed on Day 4 at 5 PM was 0 *vs*. 1.5 ± 1.65, p=0.01.

**Conclusion:** Pain score in Group A showed a significant downward trend over the four day period, compared with Group B.

**Keywords: Post-operative pain; Acute pain management; Pain relief**

## Introduction

The World Health Organization and International Association for the Study of Pain have recognized pain relief as a human right [1]. Postoperative Pain has been inadequately managed for decades and recent surveys from USA and Europe failed to show any significant improvement [2]. Suboptimal acute pain management in surgical patients carries a wide range of negative consequences, including increased morbidity, impaired physical function and quality of life, and slowed recovery [3,4]. The effects occur in diverse organ systems, the pulmonary (hypoventilation, decreased vital capacity, pulmonary infection), cardiovascular (coronary ischemia, myocardial infarction, thromboembolic events), gastrointestinal (reduced motility, ileus, nausea, vomiting) and renal (increases in urinary retention and sphincter tone, oliguria) systems. A negative impact may also be seen on immune function, the muscular system and wound healing. Finally, poorly controlled pain may impair sleep and cause psychological effects, such as demoralization and anxiety [5-7]. In addition, early postoperative pain appears to trigger prolonged use of opioids during and after hospitalization and may result in the development of chronic pain [5]. Based on literature reviews, persistent pain affects between 10% and 60% of patients after common operations [8-10]. Furthermore, inadequate pain-relief results in increased length of stay, time to discharge, readmission rates, and time before ambulation, all of which can increase the cost of care [11,12]. Numerous factors can contribute to suboptimal pain management, including lack of sufficient physician training and of patient education, as well as the side effects associated with certain analgesic therapy which contribute to non-compliance [7]. Among the factors which make pain control difficult is a lack of pain level surveillance protocols or intervention guidelines that would provide more efficient means of adjusting therapy in order to provide better pain-relief [13]. The America Pain Society Guidelines recommend the use of a valid pain assessment tool to track responses to postoperative analgesia and adjust treatment plan accordingly. Moreover, clinicians should offer multimodal analgesia, medications combined with non-pharmacological interventions [14].

## Methods

A prospective, observational, analytical study was conducted in the general surgery, department

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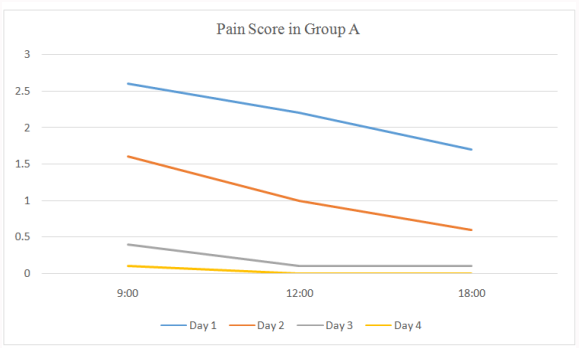


**Figure 1:** Group A Pain Score Trend.

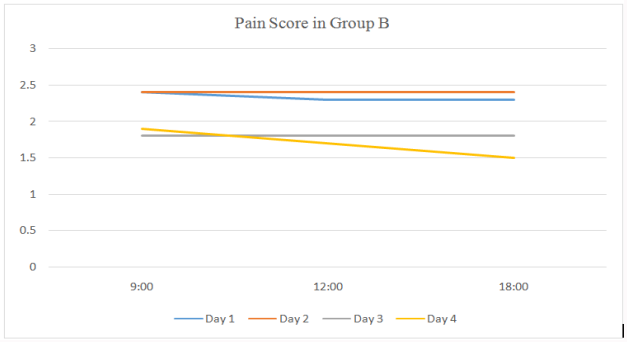


**Figure 2:** Group B Pain Score Trend.

of a district hospital. Patients subjected to laparotomy surgery under general anesthesia were included. The study period was from April to July 2019. Permission from the Quality Improvement Department of North Lincolnshire and Goole Foundation Trust was obtained. The following patients were excluded: those in intensive care unit, those who were unable to communicate, and pediatric patients. Patients were randomly divided into two cohorts: Group A, pain score was assessed three times a day and analgesia was provided accordingly, Group B, pain score was equally assessed three times a day but analgesia was provided following the routine practice (administered when requested by the patients). The pain assessment was accomplished using the Visual Analogue Scale; this involves the use of a metric line marked from 0 to 10 with word descriptions of pain at either extreme, where 0 represents "no pain" and 10 the "worst possible pain". The analgesic therapy provided was: NSADs and opioids (Codeine orally and Morphine orally/intravenously). For the quantitative variables, mean and standard deviation were calculated. The statistical test carried out was the unpaired t-test. A p-value <0.05 was considered statistically significant.

## Results

A total of 20 patients were analyzed, 10 patients each cohort group. The age ranged from 36 to 88, and mean age was 70.5 ± 15.6 in Group A and 72.6 ± 11.5 in Group B, p=0.74. 50% of patients were male in Group A compared with 40% in Group B, p=0.67. The type of surgery was: colon resection (20% Group A *vs.* 40% Group B), small bowel resection (50% *vs.* 10%), Ileo Colic Resection (0 *vs.* 20%), Anterior resection (0 *vs.* 10%), Hartmann's (20% *vs.* 10%), Incisional hernia (0 *vs.* 10%) and exploratory laparotomy (10% *vs.* 0) (Table 1). On Day 1 the Pain Score for Group A and Group B was 2.6 ± 1.07 *vs.* 2.4 ± 1.90, p=0.77 at 9 AM, 2.2 ± 1.32 *vs.* 2.3 ± 1.95, p=0.89 at 12 PM, 1.7 ± 1.34 *vs.* 2.3 ± 1.95, p=0.43 at 6 PM, respectively. On Day 2, the Pain Score for Group A and Group B was 1.6 ± 0.97 *vs.* 2.4 ± 1.71, p=0.22 at 9 AM, 1 ± 0.82 *vs.* 2.4 ± 1.71, p=0.03 at 12 PM, 0.6 ± 0.70 *vs.* 2.4 ± 1.71, p=0.009 at 6 PM, respectively. On Day 3, the Pain Score for Group A and Group B was 0.4 ± 0.52 *vs.* 1.8 ± 1.68, p=0.03 at 9 AM, 0.1 ± 0.32 *vs.* 1.8 ± 1.68, p=0.01 at 12 PM, 0.1 ± 0.32 *vs.* 1.8 ± 1.68, p=0.01 at 6 PM, respectively. On Day 4, the Pain Score for Group A and Group B was 0.1 ± 0.32 *vs.* 1.9 ± 1.29, p=0.001at 9 AM, 0 *vs.* 1.7 ± 1.49, p=0.005 at 12 PM, 0 *vs.* 1.5 ± 1.65, p=0.01 at 6 PM, respectively (Table 2). Group A showed a downward trend in the pain score throughout the four day period, compared with Group B, which maintained a nearly steady trend, with increased score on Day 2 and Day 4. There was no difference in Pain Score during Day 1. Conversely, the difference in pain score between the two cohorts was statistically significant in multiple observations thereafter, in particular Day 2 12 PM (p=0.03) and 6 PM (p=0.009), Day 3 9 AM (p=0.03), 12 PM (p=0.01) and 6 PM (p=0.01), Day 4 9 AM (p=0.001), 12 PM (p=0.005) and 6 PM (p=0.01) (Figure 1 and 2).

**Table 1**: Demographics.

| | Group A | Group B |
|---|---|---|
| **N** | 10 | 10 |
| **Age** | 70.5 ± 15.6 | 72.6 ± 11.5 |
| Male | 5 (50%) | 4 (40%) |
| Female | 5 (50%) | 6 (60%) |
| **Type of Surgery** | | |
| Colon resection | 2 (20%) | 4 (40%) |
| Small bowelresection | 5 (50%) | 1 (10%) |
| IleoColicresection | - | 2 (20%) |
| Anteriorresection | - | 1 (10%) |
| Hartmann's | 2 (20%) | 1 (10%) |
| Incisionalhernia | - | 1 (10%) |
| Exploratorylaparotomy | 1 (10%) | - |

## Discussion

Acute pain control remains a key point in the post-operative management. Inadequate pain-relief in surgical patients is associated with several negative implications, including increased morbidity, impaired wound healing, psychological effects, prolonged length of staying and increased costs [5]. An interprofessional approach should be sought to target an individualized pain management plan; in particular, different health care figures should be involved, such as clinicians, nursing staff, healthcare assistants, pharmacists and physiotherapists. Indeed, in the immediate post-operative period, nurses play an essential role in monitoring the severity of patient's pain level [13]. It is interesting to note how a meticulous approach to assess the intensity of pain can have a significant impact on reducing the postoperative pain. This study has shown an effective and easy-to-use method to achieve a safer and better pain control. Patients should be asked to score their pain on the Visual Analogue Scale three times a day, in particular, at morning, lunch time and late afternoon, and analgesia should be provided accordingly. The figures in the two cohorts showed a statistically significant difference in the postoperative pain score trend (Table 2, Figure 1 and 2). This method leads to a progressive decrease in pain over a considerably short period of time, such as the one analyzed in this study, consequently reducing morbidity, length of staying and improving the quality of life. The limitations of our study are the small sample size and the

**Table 2:** Pain Score Trend in the twoGroups over the 4 dayperiod.

| | Group A | Group B | p-value |
|---|---|---|---|
| **Day 1** | | | |
| 9 AM | 2.6 ± 1.07 | 2.4 ± 1.90 | p=0.77 |
| 12 PM | 2.2 ± 1.32 | 2.3 ± 1.95 | p=0.89 |
| 6 PM | 1.7 ± 1.34 | 2.3 ± 1.95 | p=0.43 |
| **Day 2** | | | |
| 9 AM | 1.6 ± 0.97 | 2.4 ± 1.71 | p=0.22 |
| 12 PM | 1 ± 0.82 | 2.4 ± 1.71 | p=0.03 |
| 6 PM | 0.6 ± 0.70 | 2.4 ± 1.71 | p=0.009 |
| **Day 3** | | | |
| 9 AM | 0.4 ± 0.52 | 1.8 ± 1.68 | p=0.03 |
| 12 PM | 0.1 ± 0.32 | 1.8 ± 1.68 | p=0.01 |
| 6 PM | 0.1 ± 0.32 | 1.8 ± 1.68 | p=0.01 |
| **Day 4** | | | |
| 9 AM | 0.1 ± 0.32 | 1.9 ± 1.29 | p=0.001 |
| 12 PM | 0 | 1.7 ± 1.49 | p=0.005 |
| 6 PM | 0 | 1.5 ± 1.65 | p=0.01 |

lack of functional outcomes of the patients. However, the purpose of the study was to demonstrate the positive effects of using the Visual Analogue Scale to score the post-operative pain and provide analgesia accordingly with the aim to achieve a satisfactory pain control.

## Conclusion

A suboptimal post-operative pain management represents a highly frequent condition. An effective way to allow for an adequate pain-relief in surgical patients is to assess the severity of their pain three times a day using the Visual Analogue Scale and to provide analgesia accordingly.

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