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Incidence of severe postoperative pain after cancer surgery despite intraoperative anticipation: a case controlled study

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Abstract. **Background and methods.** Anticipating postoperative pain is a routine practice in our institution. As part of a quality assurance program we used our computerized anesthetic record system database to evaluate incidence of patients having very severe postoperative pain (grade 4 on a subjective pain scale ranging from 0 to 4) in the Post Anesthetic Care Unit during a two year period. These patients were compared to a control group matched on age, type and date of surgery. Demographic characteristics, type and duration of the surgery, preoperative and intraoperative medications were compared between groups. **Results.** 78 patients out of 12,510 (0.6%) with a pain score of 4 were compared to another group of 78. No significant difference was observed with regards of demographic characteristics, duration, type of surgery, and operative pain medications. Pain scores and morphine consumption were significantly higher in the cases study group in comparison to the controlled group, 4 vs 1.6±1.1, ($p<0.05$) and 13.2±6 vs. 6.9±7mg ($p<0.05$). Patients in the cases study group had significantly more preoperative psychoactive medication: antidepressant and benzodiazepine 13 vs. 2, ($p<0.05$). **Conclusion.** The incidence of severe postoperative pain scores were less than 1% in our institution. In patients with preoperative opioid treatment, adaptation of analgesic treatment has probably prevented the occurrence of severe pain. Multimodal anticipation of postoperative pain should remain mandatory while efforts should focus to identify such patients before surgery. ▲

Keyword: postoperative pain, severe postoperative pain, benzodiazepines, morphine consumption, postoperative care unit

Introduction

In recent years, high importance is given to the prevention of postoperative pain including anticipated intraoperative pain management but also minimally invasive surgery (laparoscopy) [1-3]. There is still a percentage of patients (up to 80%) who still suffer from mild to severe postoperative pain especially upon arrival in the Postanesthetic Care Unit (PACU) which need immediate intervention [4] while progress should also to be made on education of healthcare categories [5, 6]. Adverse effects of postoperative pain are well known: significant initial distress, negative effect on immune function, wound healing and perhaps even chronic post surgical pain syndrome in case of very high postoperative pain scores [7, 8].

Anticipated postoperative pain management protocol is our current clinical practice since several years. In addition, our department saves all anesthesia and PACU events into an important database (DEIO) including more than 57,000 cases since 2001. Therefore, as part of quality-assurance program, this study was designed to assess the incidence of patients having very high postoperative pain scores, in the PACU and to identify independent factors of severe postoperative pain by comparing these patients to another group of patients having a similar type of surgery in an adjacent period.

Methods

After anesthesia and PACU stay, all the information concerning events and monitoring trend curves are saved into a powerful data base fuelled with a computerized anesthesia record system (ARK DEIO-GE ™).

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Our primary objective was to evaluate the incidence of patients having severe postoperative pain in PACU despite anticipation and to assess their demographic characteristics. Our secondary objective was to detect significant factor contributing to these high postoperative pain scores by comparison to a similar population not having severe pain. Our local ethical board committee approved the use of our database to perform this retrospective case-controlled analysis. Patients approved these types of study by signing their acceptation to participate during one of the first consultations in our hospital.

About 6,000 patients transit in our PACU per year. As a routine care, all patients undergoing surgical or interventional radiology procedures under general or regional anesthesia transit via the PACU, in addition to these cases some patients having local anesthesia only might transit the PACU for surveillance in a case by case basis depending on the type of the procedure. All patients had a standardised evaluation: temperature, pain score in a 5 grades numerical scale at rest (0 no pain, 1 mild pain, 2 moderate pain, 3 severe pain, 4 very severe pain) and a 4 grades sedation scale (0 alert, 1 sometimes drowsy easily aroused, 2 often drowsy easily aroused, 3 often drowsy difficult to arouse). Nurses enter these data manually in our computerised record via predefined lists. Other criteria such as blood pressure, pulse oximetry, pulse rate are automatically stored.

Postoperative pain was anticipated by preoperative analgesic administration using standardised multimodal protocol as follows: systematic use of moderate pain killer such as paracetamol, tramadol, nefopam, and IV morphine in case of the use of remifentanil in surgery known to yield severe pain, but also the intraoperative injection of local anesthetics through epidural or perineural injection [9]. The dose of intraoperative morphine in our setting depends on the type of anticipated postoperative pain (none, moderate or severe) and varies from 0.05 to 0.2mg/kg, according to type surgery and preoperative opiate treatment [10], local anaesthetics through epidural and peripheral catheters for all patients was injected thirty minutes before the end of surgery. Other drugs such as ketamine or non steroidal anti inflammatory drugs were also used at the discretion of the anesthetistt in charge in the PACU in rescue situations. More than 99% of the patients are extubated in the operating room after control neuromuscular blockade (NMT Datex GE™) in addition to other criteria including temperature. For PACU discharge, the following parameters are systematically checked and recorded: pain score, sedation score, temperature and vital signs such as blood pressure, oxygen saturation, pulsation, respiratory rate and postoperative nausea and vomiting status. Preoperative events, including preoperative anesthetic evaluation and patient's history are not linked to the data base. Morphine titration in PACU is started when patients has a pain score of 3 or 4. Titration starts with boluses of 2 or 3 mg (depending on age) and are renewed every 7min, it is stopped when pain scores decrease to 2 there is no limit of IV morphine titration.

During the period 2006-2007, patients were selected from the data base for having a numeric pain score-of 4. The control group was selected using similar age, type of surgery in an adjacent time period (before or after one week maximum).

Emergency surgical patients were not considered because most of them were directly managed in the intensive care unit upon completion of surgery.

Several parameters were compared between the two groups: pain scores at the arrival and before leaving PACU,

– Morphine consumption defined as the total amount of morphine injected during anesthesia and recovery period.

– Preoperative treatment classified into groups: cardiovascular, psychoactive, analgesic (opiates and non-opiates), anti-inflammatory.

Epidural failure was considered when additional IV morphine injection was necessary to decrease postoperative pain related to surgery as was peripheral nerve block failure. Student t test, Mann Whitney rank sum test, χ^2 test or Fischer exact test were used to compare data with Sigmastat statistical software for Windows V3 (USA).

Results

Data were obtained from a total of 12,510 patients, 6,495 in 2006 and 6,015 in 2007. Exhaustivity (number of patients with at least a record of one pain score divided by the number of procedures) was 91% in 2006 and 94% in 2007.

Demographic characteristics are represented in Table 1; no significant difference was detected