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SHORT COMMUNICATION

Who's asking? Patients may under-report postoperative pain scores to nurses (or over-report to surgeons) following surgery of the female reproductive tract

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Abstract
Objective To determine if postoperative pain reporting via standardised visual analogue scale (VAS) is affected by which member of the healthcare team collects the information.
Materials and methods A standardised ten-point VAS measured postsurgical pain level among patients ($n = 60$) undergoing laparotomy via Pfannenstiel incision. All study patients received the same patient-controlled analgesia and uniform post-operative orders were used. VAS data were gathered from patients by surgeons (MD) and nurses (RN) 6 h and 24 h after surgery; RNs and MDs independently recorded patients' VAS pain scores in variable order.
Results When assessed 6 h after surgery, the average pain level reported by patients to RNs was significantly lower than that reported to MDs (3.3 ± 2.8 vs. 4.0 ± 2.4; $P = 0.02$). Average patient pain levels remained lower when reported to RNs 24 h post-operatively compared to that reported to MDs, although this difference was not significant (1.9 ± 2.1 vs. 2.1 ± 2.1; $P = 0.39$). Whenever post-surgical patients provided different VAS scores for pain level to RNs and MDs, the higher pain reading was always reported to the MD.
Conclusion This study identified important variances in subjective pain reporting by patients that appeared to be influenced by who sampled the data. We found patients gave lower VAS pain scores to RNs compared to MDs; the reverse pattern was never observed. Post-surgical patients may communicate pain information differently depending on who asks them, particularly in the early post-operative period. Accordingly, patient pain data gathered over time by a care team with a heterogeneous composition (i.e., RNs, MDs) may not be fully interchangeable. Patient projections of pain severity and/or intensity appear to vary as a function of who evaluates the patient.

Keywords Post-operative pain · Visual analogue scale · Nurse · Surgeon · Discordance

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Introduction

Effective relief from acute pain after surgery minimises stress and contributes greatly to a positive overall hospital experience. This key objective relies on all members of the care team working together and acting on the basis of accurate information. At the centre of this dynamic is the patient, although it is not known whether patients regard nurses and surgeons in the same way when communicating the intensity of pain following surgery. When considering how to measure a patient's post-surgical pain intensity, could it depend on who is asking? To study this, our investigation prospectively compared pain scores expressed by

post-operative patients almost simultaneously both to nurses and surgeons. This phenomenon has not been specifically examined in this way; the current pilot study was undertaken to refine our understanding of how pain intensity is communicated in the hospital setting.

Material and methods

Following approval by the Atlanta Medical Center institutional review board, female adults ($n = 60$) were enrolled for study during a 10-month period ending May 2005. Written informed consent was obtained from study participants, all of whom underwent laparotomy via Pfannensteil incision for gynaecologic indications. Patients were excluded if they reported an allergy to local anaesthetics or peptic ulcer disease, renal or liver disease, progressive neurological condition, or history of substance abuse. Only ASA Class I or II patients were eligible, and no patients receiving spinal or epidural anaesthesia were enrolled. All patients had uniform preoperative and postoperative orders and no oral or intravenous analgesics were administered preoperatively. In all cases, standard general endotracheal anaesthesia was performed under the supervision of an attending anaesthesiologist. Operative times and estimated blood loss were comparable for all patients, none of whom experienced any intraoperative complications. Fentanyl was the only analgesic given during surgery, with the final dose being administered ≥30 min before the end of the procedure. Post-operative intravenous patient-controlled analgesia (PCA) was provided for all patients with a basal morphine sulphate rate of 2 mg. Lockout interval was 6 min, maximum morphine dose was established at 12 mg/h and there was no loading dose. Additionally, all patients received i.v. ketorolac (30 mg) every 6 h × 48 h.

A visual analogue scale (VAS) was used to assess post-operative pain intensity similar to the methods reported previously [1–6], where 0 = no pain and 10 = maximum/intolerable pain. VAS scores were obtained from all patients in duplicate, by nurses ($n = 11$) and surgeons ($n = 5$), who were clearly identified as such and who independently evaluated patients at defined periods. The interval between measurement by nurse and surgeon of patients' post-operative pain was <5 min and the order of assessment (i.e., nurse first-MD next vs. MD first-nurse next) was random. Pain scores were registered at 6 and 24 h after surgery. All VAS score information was immediately entered into a secured research datasheet which could not be accessed by any RN or MD prior to their interval pain score assessment. After all study patients were discharged from hospital, VAS pain data were stratified according to "RN-gathered" versus "MD-gathered". Mean (±SD) VAS scores from the two groups were compared by two sided paired Student's *t*-test; differences with P-value < 0.05 were considered statistically significant.

Results

Post-operative pain was registered in a total of 60 patients. As shown in Table 1, when patients used VAS scores for pain reporting to RNs, results were significantly lower 6 h after surgery than when pain was reported to MDs (3.3 ± 2.8 vs. 4.0 ± 2.4; $P = 0.02$). Patients reported persistently lower VAS pain scores to RNs at 24 h post-surgery compared to the VAS score given to MDs (see Fig. 1), although this difference was not significant (1.9 ± 2.1 vs. 2.1 ± 2.1; $P = 0.39$). In this population, the mean time to initiate oral analgesics was 23.0(±5.0) h and average length of stay (LOS) was 49.0(±15.1) h. In the post-surgical recovery area, the mean quantity of post-operative i.v. morphine sulphate used was 8.1(±3.7) mg. On average, PCA was discontinued 26.1(±5.5) h following surgery, and mean total morphine sulphate consumption was 46.5(±30.3) mg for the entire hospitalisation.

Table 1 Mean visual analogue scale (VAS) pain scores reported by patients ($n = 60$) after gynaecologic surgery

Post-operative interval (h)	RN	MD	P[a]
6	3.3 ± 2.8	4.0 ± 2.4	0.02
24	1.9 ± 2.1	2.1 ± 2.1	0.39

RN nurse, *MD* surgeon

[a] By paired Student's *t*-test

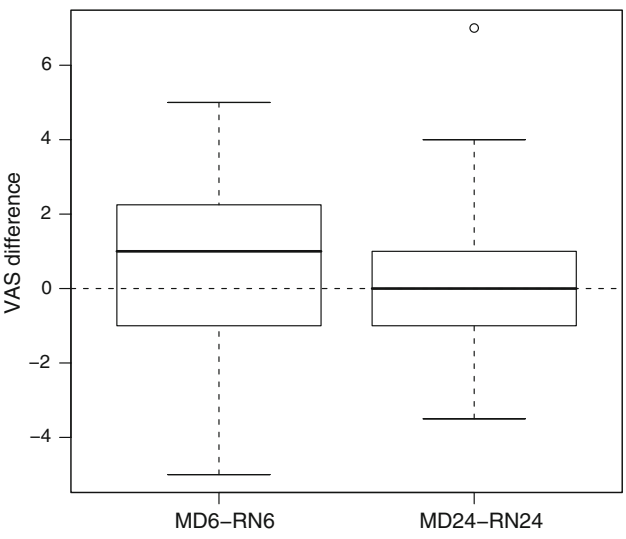

Fig. 1 Comparison of VAS pain score differences as reported by patients to surgeons (MD) and nurses (RN) at 6 and 24 h after gynaecologic surgery

Discussion

How best to manage postoperative pain represents a significant challenge in current GYN-surgical practice. Unrelieved discomfort after surgery is a common clinical problem [7, 8] and numerous standardised evaluation tools have been developed specifically for its clinical assessment [1, 2, 9–12]. The highly variable and essentially subjective nature of pain [13] understandably brings little consensus on which assessment methodology is ideally matched to measure it. Certainly as the age of the patient population increases, research on effective postoperative pain control is needed with even greater urgency [4]. However, if clinical interpretations of pain were found to be influenced by the professional role of the healthcare team member assessing it, then the basic pain management equation would require recalibration. We explored this possibility, and important differences between how patients communicate their pain to nurses and surgeons were indeed noted.

The finding that nurses might underestimate a patient's post-operative pain is not new [8]. The patient-nurse relationship during post-operative convalescence is important because nurses figure prominently in post-operative pain management [14], particularly when analgesics are prescribed by a physician on an "as needed" basis [15]. Despite nurses' central role in post-operative pain control, there is little agreement about when and how often to evaluate the effectiveness of postoperative pain control [15]. Since our study focused on standardised pain scores expressed by patients almost simultaneously both to nurses and surgeons, the present study was able to frame the nurse-collected VAS data together with the surgeon-collected VAS data for direct comparison. We found that when variances were evident, study patients routinely conveyed the lower pain score to their nurse. To our knowledge, this phenomenon has not been previously reported in the literature. Such a finding immediately reshapes the communicative problem-model of pain management away from a receiver (caregiver) defect, and strongly suggests the need for additional studies on transmitter (patient) issues. This dynamic merits close study, since patient communication about pain intensity is a major factor affecting the success of pain management [16].

This pilot investigation of post-operative pain assessment by nurses and surgeons has some important limitations. First, our study relied on VAS to assess patient pain after surgery, but other approaches to pain measurement could have been used. Intraclass correlations of pain scales (including VAS) found that of four scales assessed to report pain intensity, the Faces Pain Scale-Revised (FPS-R) was preferred [2]. However, previous investigators have validated VAS as an effective method to assess pain [6, 17, 18]. Since our study was based on female patients undergoing surgery of the reproductive tract, it cannot be known if our findings are generalisable to male patients. It would have been intriguing to compare variation in pain reporting as a function of pain intensity, although this was outside the scope of this investigation. And, although more frequent pain queries would have yielded additional data, our study was designed to avoid any unintended effect of agitating patients by excessive intrusiveness during the post-operative period. The gender of surgeons and nurses also was not correlated to patient VAS score reports, and this may have introduced some bias.

Nevertheless, this investigation brings forward a vexing issue in the study of post-operative pain control. Because our research found patients reporting the same pain differently to nurses and surgeons, the familiar axiom "someone with two watches can never know the exact time" finds an unwelcome application. An earlier study of patient-reported pain scores and observational pain-related behaviour scores found a tenuous relationship between patient perception and expression of pain as interpreted by a health care provider [1]. More recent research has confirmed this gap between patient and nurse assessments of postoperative pain management [15]. Differences in "content of strategies" for clinical pain assessment between nurses and physicians have been explored [19] but not with the primary aim of directly comparing how patients report pain information to these care providers. One investigation of pain rating accuracy as a function of who collects pain data (RN vs. MD) found both nurses and physicians to be poor estimators of pain intensity [7], but again no specific RN versus MD comparison was undertaken. But why would patients report relatively higher pain scores to surgeons, compared to nurses? Is the information relayed to the surgeon any more accurate than that conveyed to nurses? Can either VAS score be believed? What is it about the role of "surgeon" that might induce exaggeration in reporting of patient pain intensity after surgery? Although tentative answers have been proposed, definitive conclusions await additional data—preferably derived from multi-institutional, trans-disciplinary studies. Such future research could clarify earlier reports intimating a propensity of nurses to "down-grade" patient pain. While this tendency has been attributed to workload issues, scheduling concerns, and staffing limitations [15], the a priori possibility that patients might attenuate their own projection of post-operative pain when queried by a nurse apparently has never been considered.

In summary, we strongly endorse the need for ongoing scholarship in the area of post-operative pain management. Yet the present study cautions against interchanging or combining patient pain data gathered by both nurses and surgeons, because any differences could reflect projector bias related to which member of the clinical team listened

to the patient. If patients modify their subjective appreciation of pain as a function of the target receiving the message, as suggested here, then some established and fundamental paradigms about nurse under-reporting of pain should be revisited. While nurses' management of patients' postoperative pain has been described as inadequate [14], it is unclear if surgeons actually do a better job. Moreover, the information patients give surgeons about pain after surgery may not be as accurate as originally thought.

Conflict of interest statement None.

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