Chula Med J Vol. 50 No. 1 January 2006

Factors involving patient satisfaction on postoperative pain management at King Chulalongkorn Memorial Hospital

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Kumwilaisak K, Burimsittichai R, Charuluxananan S, Premsamran P, Niruthisard S. Factors involving patient satisfaction on postoperative pain management at King Chulalongkorn Memorial Hospital. Chula Med J 2006 Jan; 50(1): 17 - 28

Background : *Patient satisfaction may involve many factors such as pain intensity, wound characteristics and pain management.*

Objective : *To discover factors that influence patient satisfaction on postoperative pain treatment at King Chulalongkorn Memorial Hospital.*

Setting : *Recovery room and surgical wards, King Chulalongkorn Memorial Hospital, 1500-bed tertiary hospital.*

Research design : *Prospective and descriptive study.*

Patients : *Patients who underwent either an elective general or urological or plastic surgery under anesthesia at King Chulalongkorn Memorial Hospital from September to December, 2004 were recruited into the study.*

Method : *Visual analog pain score (VAS=0-100 mm) for pain intensity and patient satisfaction score (0-10; 0= worst and 10=best) for postoperative pain assessment of 273 patients were collected by nurse anesthetists at recovery room and surgical wards at 24th hour. The data were statistically analyzed by SPSS version 11.5. Categorical data and continuous data were analyzed by Chi-square tests and unpaired t test respectively. Multiple logistics regression was also used. $P<0.05$ was considered significant.*

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Results : *At recovery room, 96.0 % of patient satisfaction score ≥ 7. Factors that associated higher VAS were not spinal anesthesia, P<0.001, Odd Ratio=0.07 (95%CI=0.02-0.31) and present of drainage, P=0.015, OR= 6.47 (1.45-28.92). The factors, that heightened the patient satisfaction score, were absent underlying ischemic heart disease, P= 0.008, OR=81.17 (3.23-2038.62), smaller wound size, P=0.006, OR=0.85 (0.07-0.98) and absence of drainage, P=0.048, OR=10.03 (1.92-52.34). At the wards, 26 % of the patients reported VAS ≥ 50 mm, but high VAS was not found associated with patient satisfaction score. Male gender, P= 0.003, OR=2.54 (1.37-4.71) and drainage present, P 0.048, OR=10.03 (1.92-52.34) associated with VAS ≥ 5. No factor was founded associated with patient satisfaction.*

Conclusion : *Majority of the patients in recovery room and surgical wards gave high level of satisfaction of pain management. Factors related to high satisfaction were smaller wound size and absence of drainage. However, high VAS was not found associated with low satisfaction score.*

Keywords : *Patient satisfaction, Postoperative pain management, Thai, Risk factor.*

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Received for publication. October 2005.

กัญญา คำวิลัยศักดิ์, รัตนาภรณ์ บุริมสิทธิชัย, สมรัตน์ จารุลักษณานันท์, พรเทพ เปรมสำราญ, สุปราณี นิรุตติศาสน์. ปัจจัยที่ส่งผลต่อความพึงพอใจต่อการระงับปวดของผู้ป่วยหลังผ่าตัดที่โรงพยาบาลจุฬาลงกรณ์. จุฬาลงกรณ์เวชสาร 2549 ม.ค; 50(1): 17 - 28

วัตถุประสงค์ : *เพื่อศึกษาปัจจัยที่ส่งผลต่อความพึงพอใจของผู้ป่วยหลังผ่าตัด*

สถานที่ทำการศึกษา : *ห้องพักฟื้นและหอผู้ป่วยศัลยกรรม โรงพยาบาลจุฬาลงกรณ์*

รูปแบบการวิจัย : *การศึกษาแบบพรรณนาชนิดไปข้างหน้า*

ผู้ป่วยที่ได้ทำการศึกษา : *ผู้ป่วยที่เข้ารับการผ่าตัดทางศัลยกรรมทั่วไป ศัลยกรรมตกแต่ง และศัลยกรรมทางเดิน ปัสสาวะจำนวน 273 คน*

วิธีการศึกษา : *วิสัญญีพยาบาลเป็นผู้เก็บข้อมูลของผู้ป่วย และสัมภาษณ์ผู้ป่วยถึงความปวดหลังผ่าตัดโดยใช้ visual analog score (VAS=0-100 mm) และคะแนนความพึงพอใจ (patient satisfaction score; 0-10, 0=ไม่พอใจมากที่สุด และ10=พอใจมากที่สุด) เพื่อวิเคราะห์ปัจจัยที่เกี่ยวข้องกับความปวดหลังผ่าตัด และความพึงพอใจต่อการรักษาความปวดหลังผ่าตัด วิเคราะห์ข้อมูลทางสถิติด้วย Chi-square tests, t tests และ multiple logistics regression*

ผลการศึกษา : *ร้อยละ 96 ให้คะแนนความพึงพอใจที่ห้องพักฟื้นมากกว่าหรือเท่ากับ 7 ปัจจัยที่มีผลเพิ่มความปวดหลังผ่าตัดที่ห้องพักฟื้น คือการไม่ให้ยาระงับความรู้สึกทางไขสันหลัง, P<0.001,OR=0.07(0.02-0.31) และการมีท่อระบายเลือดที่แผลผ่าตัด, P=0.015,OR= 6.47(1.45-28.92) โดยปัจจัยที่มีผลเพิ่มความพึงพอใจคือ ไม่มีภาวะหัวใจขาดเลือด, P=0.008,= OR=81.17 (3.23-2038.62), ขนาดแผลที่เล็ก, P=0.006,OR=0.85 (0.07-0.98) และการไม่มีท่อระบายเลือด, P=0.048,OR=10.03 (1.92-52.34) ร้อยละ 26 ของผู้ป่วยที่หอผู้ป่วยมีคะแนนความปวดมากกว่าหรือเท่ากับ 5 ปัจจัยที่ส่งผลเพิ่มคะแนนความปวดคือ เพศชาย, P=0.003,OR=2.54 (1.37-4.71) และ การมีท่อระบายเลือด, P=0.048, OR=10.03 (1.92-52.34) ไม่มีปัจจัยใดที่สัมพันธ์กับความพึงพอใจที่ 24 ชั่งโมง*

สรุป : *ผู้ป่วยที่มาผ่าตัดส่วนใหญ่มีความพึงพอใจสูง ปัจจัยที่เพิ่มความพึงพอใจได้แก่ ขนาดแผลที่เล็ก และการไม่มีท่อระบายเลือด อย่างไรก็ตามยังมีผู้ป่วยที่ให้คะแนนความปวดหลังผ่าตัดสูง แต่ไม่มีผลกับความพึงพอใจ*

คำสำคัญ : *ความพึงพอใจ, ความปวด, ไทย, การผ่าตัด*

Relief of acute pain during postoperative period is a responsibility of the anesthesiologist, because postoperative pain may cause many undesirable complications such as postoperative pulmonary complications (PPCs)[1], myocardial injury, endocrine stress responses and immunological imbalance, which trigger infections. In addition, acute severe pain may affect patients' emotion such as dissatisfaction and uncomfortable feeling. Although anesthesiologists has been trained to administrate opioids by many methods, such as patient-controlled analgesia (PCA), neuraxial opioids and intravenous opioids titration, to develop a new postoperative pain treatment protocol remains a fascinating topic. Today, multimodal approaching is an attractive way to improve pain treatment, not only to decrease pain intensity, but also to decrease postoperative complications. For example, gabapentin is known to reduce fentanyl consumption, postoperative nausea and vomiting (PONV) following a lumbar diskectomy.[2]

Effective pain management with less complication can cause higher satisfaction. Research on the correlation of patient satisfaction with pain treatment indicates that patients tend to report high levels of satisfaction even though pain severity remains relatively high. [3-8] Seldom did they report dissatisfaction, because they trusted in their treatment providers. Therefore, to improve the quality of postanesthetic care unit (PACU) and acute pain service (APS) at King Chulalongkorn Memorial Hospital, we studied a prospective and descriptive study to investigate factors related to postoperative pain severity and patient satisfaction score.

Materials and Methods

We collected data from patients who underwent elective general or urological or plastic surgery from September 1st to December 31st 2004. Nurse anesthetists recorded data at PACU and at surgical wards at 24th hour postoperatively. Two hundreds and seventy-three elective patients were recruited in our study. The following demographic data: age, gender, educational level, underlying diseases, choice of anesthesia, type of operation and complication in PACU were systematically recorded. Factors that may influence postoperative pain such as the size and position of the surgical wounds, the amount and position of drains or intercostals drainage (ICD), the retention of Foley's catheter and postoperative doctor's order which included the type, route and dose of analgesic drugs were recorded. Visual analog pain score (VAS=0-100 mm) and patient satisfaction score for postoperative pain management (0-10; 0= worst and 10=best) were asked by nurse anesthetists at PACU and surgical wards at 24th hour postoperatively. Nurse anesthetists at PACU asked patients about pain score using VAS, after they had gradually regained their consciousness. An anesthesiologist or a nurse anesthetist at PACU gave pain treatment to the patients who had pain. Before discharge from PACU, another anesthesiologist or nurse anesthetist asked the patients again about their postoperative pain VAS score and patient satisfaction score for postoperative pain management. At 24th hour, a nurse anesthetist visited and recorded VAS and patient satisfaction score at the wards again. In addition, we also collected the total amount and administration frequency of analgesic drugs which the patients received at the wards.

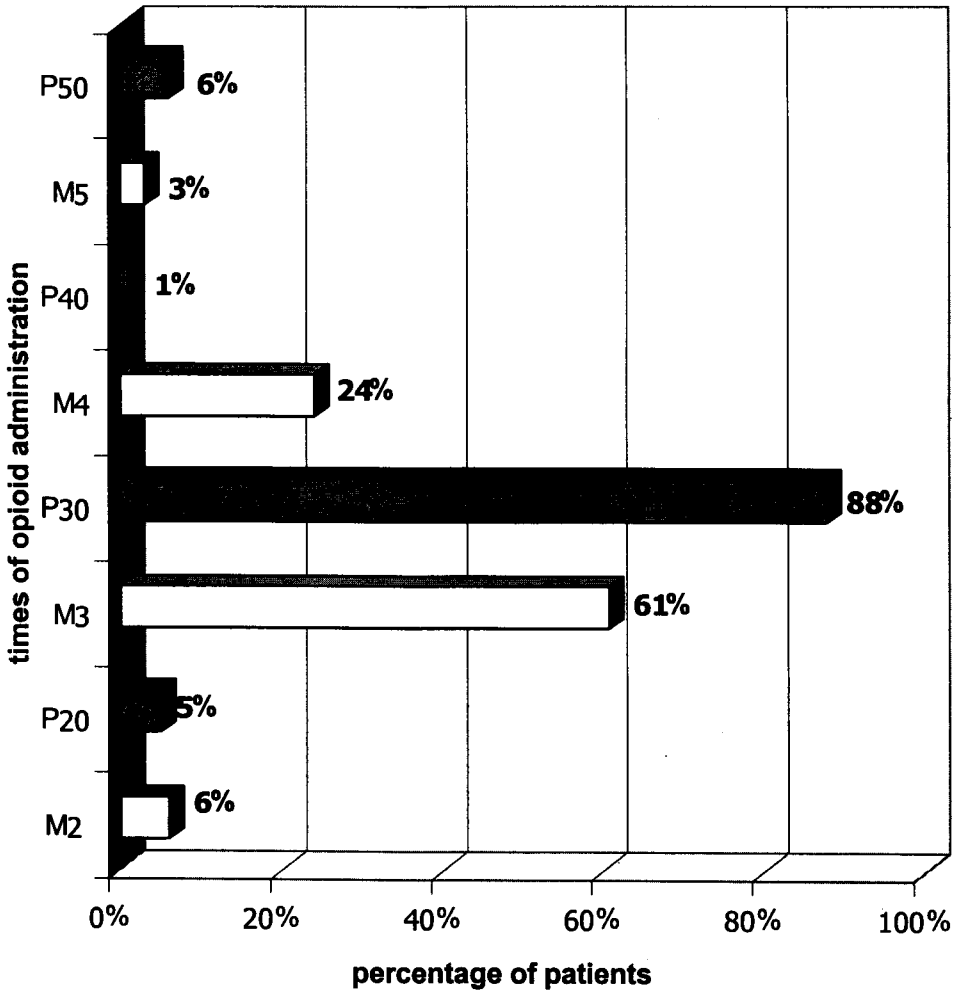
The data analysis was performed by SPSS for Windows Version 11.5. The correlations of each factor with VAS ≥ 5 or patient satisfaction score ≥ 7 were analyzed by Chi-square tests, t tests and multiple logistic regression. All comparisons were two-tailed, and P value of less than 0.05 was required to rule out the null hypothesis.

Table 1. Univariate analysis of demographic, anesthetic characteristics divided by pain intensity at 24th hour.

Variable	Pain intensity at 24 th hour		
	VAS ≥ 5	VAS<5	P value
	72(26.4 %)	201(73.6 %)	
Gender			0.003
• Male	48 (66.7 %)	86 (42.8 %)	
• Female	24 (33.3 %)	115 (57.2 %)	
Weight (kg)	60.8±11.6	59.7±11.8	0.150
Age(yrs)	52.3±16.1	53.1±17.2	0.693
Level of Education			0.158
• Below university	59 (81.9 %)	147 (73.1 %)	
• University	13 (18.1 %)	54 (26.9 %)	
Underlying Diseases			
• DM	5 (6.9 %)	31 (15.4 %)	0.068
• Hypertension	16 (22.2 %)	37 (18.4 %)	0.483
• Ischemic heart disease	1 (1.4 %)	2 (1.0 %)	0.783
• Renal failure	1 (1.4 %)	4 (2.0 %)	0.744
Choice of anesthesia			0.071
• General anesthesia	42 (58.3 %)	129 (64.2 %)	
• Spinal anesthesia	20 (27.8 %)	61 (30.3 %)	
• Others	10 (13.9 %)	11 (5.5 %)	
Postoperative pain prescription			
• Morphine IV/IM	20 (27.8 %)	41 (20.4 %)	0.899
• Pethidine IV/IM	44 (61.1 %)	108 (53.7 %)	0.285
• NSAIDs	0	8 (4.0 %)	0.086
• COX-2 inhibitor	0	5 (2.4 %)	0.129
Site of wound			
• Upper abdomen	11 (15.3 %)	25 (12.4 %)	0.541
• Lower abdomen	24 (33.3 %)	44 (21.9 %)	0.054
• Extremities	6 (8.3 %)	27 (13.4 %)	0.255
• Superficial (breast, thyroid)	13 (18.1 %)	62 (30.8 %)	0.074
Size of wound			
• > 10 cm	18 (30.3 %)	43 (21.4 %)	0.006
• 5-10 cm	22 (36.7 %)	55 (27.4 %)	
• < 5 cm	20 (33.3 %)	73 (36.3 %)	
Drain			
• Surgical drain	6 (8.3 %)	4 (2.0 %)	0.035
• Foley's catheter	13 (18.1 %)	35 (17.4 %)	0.902

Results

The demographic data, patient characteristics, anesthetic profile, postoperative complication and wound characteristics are shown in table 1. In the view of postoperative pain order, intravenous, was the major route of pain treatment (71.8 %), oral route was 9.1 % and intramuscular was 5.4 %. Opioids, pethidine (55.7 %) and morphine (22.3 %), were the most common drugs used for postoperative pain management. Doses of morphine and pethidine are showed in Figure 1. Non-opioid such as NSAIDs (2.9 %), COX-2 inhibitor (1.8 %) and tramal (7.3 %) were occasionally prescribed.



Abbreviation: M2, M3, M4, M5 = morphine 2, 3, 4, 5 mg
P20, P30, P40, P50 = pethidine 20, 30, 40, 50 mg

Figure 1. Percentage of patients received postoperative prescription with in 24 hours.

At PACU

Table 2 and 3 show factors significantly related to postoperative pain VAS score ≥ 5 and patient satisfaction score ≥ 7 for postoperative pain management. During patient admission in PACU, the most common complication was PONV (4.0 %). 248 patients (89.7 %) reported VAS lowers than thirty millimeter when they were discharged from PACU. Spinal anesthesia was related to lower VAS, P<0.001, OR=0.07 (0.02-0.31). Present of drainage related to higher VAS, P 0.015, OR= 6.47(1.45 - 28.92).

256 patients (96.0 %) had satisfaction score equal or more than seven. Comparatively, the factors, which associated patient satisfaction score <7, were underlying ischemic heart disease, P=0.008, OR=81.17 (3.23-2038.62), wound size<5 cm, P=0.006, OR=0.85 (0.07-0.98) and present of drainage, P=0.048,OR=10.03 (1.92-52.34).

Table 2. Factors associated with VAS ≥ 5 at PACU (multivariable models).

Variables	Parameter estimate	Standard error	P	Adjusted odds ratio (95%CI)
Spinal anesthesia	-2.63	0.75	<0.001	0.07 (0.02-0.31)
Drain	1.87	0.70	0.015	6.47 (1.45-28.92)

Table 3. Factors associated with patient dissatisfaction (PSS< 7) at PACU (multivariable models)

Variables	Parameter estimate	Standard error	P	Adjusted odds ratio (95%CI)
Ischemic heart disease	4.40	1.65	0.008	81.17 (3.23 -2038.62)
Wound size<5cm	-2.47	1.25	0.006	0.85 (0.07-0.98)
Drain	2.30	0.83	0.048	10.03 (1.92-52.34)

Table 4. Factors associated with VAS ≥ 5 at 24 hour (multivariable models).

Variables	Parameter estimate	Standard error	P	Adjusted odds ratio (95%CI)
Male	0.93	0.31	0.003	2.54 (1.37-4.71)
Drain	1.46	0.68	0.048	10.03 (1.92-52.34)

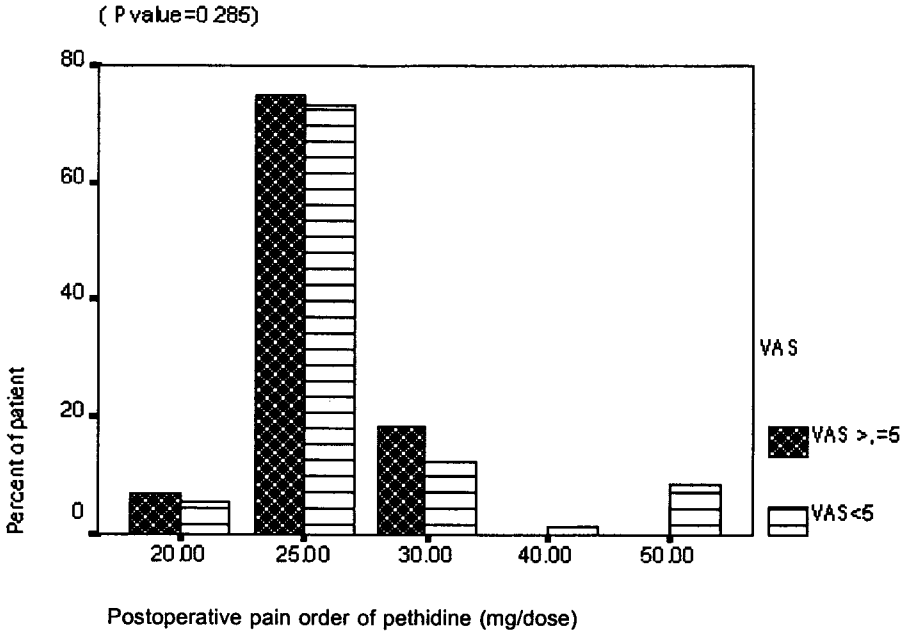


Figure 2. The percentage of pateint clustered by pethidine dose and VAS.

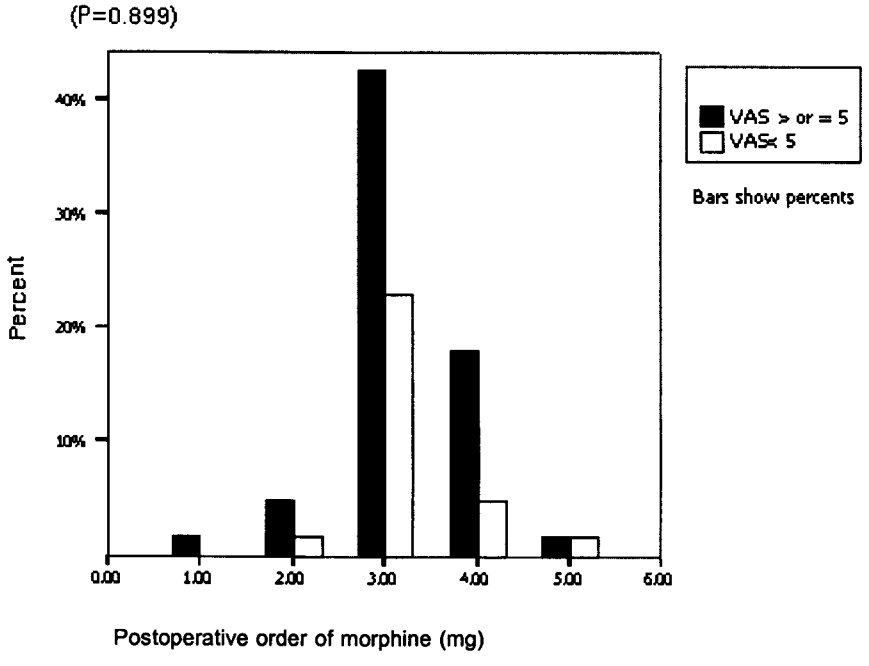


Figure 3. Postoperative morphine order (mg) clustered by VAS.

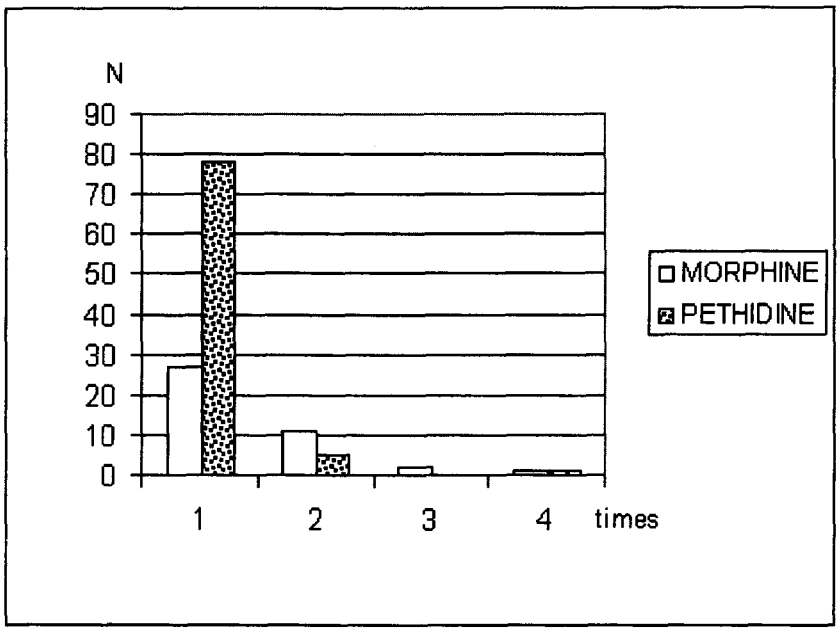


Figure 4. Frequency of opioid administered at ward with in 24 hours.

At the wards

There were 26 % of the patients who reported VAS higher than fifty millimeter, but high VAS at 24th hour did not associate with the patient satisfaction score. Male gender, P=0.003, OR=2.54 (1.37-4.71) and drainage present, P=0.048, OR=10.03 (1.92-52.34) associated with VAS $\geq$ 5. However, no factor demonstrated statistical significant relationship with patient satisfaction.

In real situation, the opioid administration with in 24 hours postoperative period is demonstrated in Figure 4. The mode of frequency of opioids administration during 24-hour was only once. However, the majority of patients (95.3 %) revealed satisfaction score for postoperative analgesia higher than 7.

Discussion

Through extensive scientific investigation, the knowledge on the pathophysiology of acute pain was not only explored, but new nociceptives were also discovered. Indeed, the understanding of the pathway of acute pain is usefully that it improves post-anesthesia care and acute pain service (APS). Many researches have established different protocols for pain treatment that can decrease pain intensity.[12-16] Although, some researches presented the efficacy of various pain treatment protocol,[12-16] others focused on the association of patient satisfaction with pain treatment which was indicated by less correlation among them.[3-8]

According to our study, almost 90 % of postoperative VAS scores at the recovery room was lower than three when the patient was discharged from PACU, which reflects very good postoperative analgesia service at PACU. Even though, the pain treatment at PACU has not been under a specific protocol, all anesthesiologists were able to treat their patients properly. Factors that involved heightening

of VAS scores at PACU were not spinal anesthesia and present of drainage. Normally postoperative patients, who underwent general anesthesia, perceived pain after the woke up. A meta-analysis showed that epidural analgesia provided better postoperative analgesia when compared with parenteral opioids.[16] However, a study on postoperative pain management in abdominal procedure by Shapiro et al.[14] found that basic pain treatment was the least expensive, adequate pain management and less intensive nursing care when compared to epidural analgesia and IV-PCA. At King Chulalongkorn Memorial Hospital, however, spinal morphine was frequently provided for postoperative analgesia, this has caused high patient satisfaction score.[17-19] Constructing the postoperative pain treatment protocol for high-risk patients may be able to improve acute pain service at King Chulalongkorn Memorial Hospital.

Regarding the patient satisfaction on postoperative pain treatment, the factors that increase patient satisfaction were, namely: having no underlying ischemic heart disease, having smaller wounded size and absence of drainage. As patients who have ischemic heart disease may have type A personality, they may easily experience discomfort. Two other factors were smaller wounded size and absence of drainage. Consequently, minimal invasive surgery seems necessary.

In a previous study[20], four important factors of patient preference for immediate postoperative recovery were: PONV, pain, alertness and additional cost. In our study, however, small proportion of PONV patients (4 %) did not give low satisfaction score. One explanation was that our study population, which was different from the previous study was confined to gynecological surgery.

At the ward, one-fourth of the patients perceived moderate to severe pain (VAS $\geq$ 50 mm) which might associate with male gender and present of drainage. Although, rarely did the patients receive opioid injection more than twice, low frequency of opioid injection did not relate to pain intensity. Three mg of morphine and 25 -30 mg of pethidine may be adequate for pain relief in Thai patients. Patient satisfaction score in our study was not related to visual analogue pain score, and neither was it in any previous study.[3-8] Moreover, no other factor was found associated with patient dissatisfaction at surgical ward. However, many factors that were not studied in our study and they, may influence patient satisfaction such as nurses' attention and complication from pain treatment.

Basic pain treatment is still useful for postoperative pain management.[15] However, patient who has factor involving high pain intensity such as not spinal anesthesia and larger surgical wound should be treated carefully. Postoperative supplement of NSAIDs and COX-2 inhibitor could not only reduce pain intensity but also increase patient satisfaction.[21] Finally, minimally invasive surgery could improve patient satisfaction.

Conclusion

Majority of the patients in PACU and surgical wards gave high satisfaction levels of pain management. Factors related to high satisfaction were, namely: smaller wound size and absence of drainage. However, high VAS was not correlated with low satisfaction score.

References

1. Shea RA, Brooks JN, Dayholl NE, Keck J. Pain intensity and postoperative pulmonary complications among the elderly after abdominal surgery. Heart Lung 2002 Nov/ Dec;31(6):440-9
2. Pandey CK, Navkar DV, Giri PJ, Raza M, Behari S, Singh RB, Singh U and Singh PK. Evaluation of optimal dose of gabapentin for posto-perative pain relief after lumbar diskectomy. J Neurosurg Anesthesiol 2005 Apr;17(2): 65-8
3. Dawson R, Spross JA, Jablonski ES, Hoyer DR, Sellers DE, Solomon MZ. Probing the paradox of patients' satisfaction with inadequate pain management. J Pain Symptom Manage 2002 Mar;23(3):211-20
4. Miaskowski C, Nichols R, Brody R, Synoid T. Assessment of satisfaction utilizing the American Pain Society's Quality Assurance Standards on acute and cancer-related pain. J Pain Symptom Manage 1994 Jan;9(1):5-11
5. Jamison RN, Ross MJ, Hoopman P, Griffen F, Levy L, Daly M, Schaffffer JL. Assessment of postoperative pain management: patient satisfaction and perceived helpfulness. Clin J Pain 1997 Sep;13(3):229-36
6. Jornson LR, Magnami B, Chan V, Feranate FM. Modifers of patient-controlled analgesia efficacy. I. Locus of control. Pain 1989 Oct; 39(1):17-22
7. Sherwood G, Adams-McNeill J, Starck PL, Nieto B, Thompson CJ. Quality assessment of hospitalized patients' satisfaction with pain management. Res Nurs Health 2002 Dec; 23(6):486-95
8. McCracken LM, Klock PA, Mingay DJ, Asbury JK, Sinclair DM. Assessment of satisfaction with treatment of chronic pain. J Pain Symptom Manage 1997 Nov;14(5):292-9
9. Woolf CJ. Recent advances in the pathophysiology of acute pain. Br J Anaesth 1989 Aug; 63(2): 139-46
10. Kehlet H, Dahl JB. The value of "multi-modal" or "balanced analgesia" in postoperative pain treatment. Anesth Analg 1993 Nov;77(5): 1048-56
11. Woolf CJ, Chong MS. Preemptive analgesia-treating postoperative pain by preventing the establishment of central sensitization. Anesth Analg 1993 Aug;77(2):362-79
12. Dahmani S. Dupont J. Mantz J. Desmonts M, Keita H. Predictive factors of early morphine requirements in the post-anesthesia care unit (PACU). Br J Anaesth 2001 Sep;87(3):389-9
13. Aubrun F, Langeron O, Quesnel C, Coriat P, Riou B. Relationships between measurement of pain using visual analog score and morphine requirement during postoperative intravenous morphine titration. Anesthesiology 2003 Jun;98(6):1415-21
14. Shapiro A, Zohar E, Hoppenstien D, Ifrach N, Jedeikin R. A comparison of three techniques for acute postoperative pain control following major abdominal pain surgery. J Clin Anesth 2003 Aug;15(5):345-50
15. Sekar C, Rajasefaran S, Kannan R, Reddy S, Ajoy T, Shetty P, Pithwa YK. Preemptive analgesia for postoperative pain relief in lumbosacral spine surgeries: a randomized

controlled trial. Spine J 2004 May-Jun;4(3): 261-4

16. Block BM, Liu SS, Rowlingson AJ, Cowan AR, Cowan JA, Wu CL. Efficacy of postoperative epidural analgesia. JAMA 2005 Nov;290(18): 2455-63
17. Rodanant O, Sirichotewithayakorn P, Sriprajittichai P, Charuluxananan S. An optimal dose study of intrathecal morphine in gynecological patients. J Med Assoc Thai 2003 Jun; 86 Suppl 2: S331-7
18. Charuluxananan S, Sriprajittichai P, Rodanant O and Kyokong O. Factors related to patient satisfaction regarding spinal anesthesia. J Med Assoc Thai 2003 Jun ;86 Suppl 2: S338-43
19. Charuluxananan S, Somboonviboon W, Kyokong O, Nimcharoendee K. Ondansetron for treatment of intrathecal morphine-induced pruritus after cesarean delivery. Reg Anesth Pain Med 2000 Sep-Oct;25(5):535-9
20. Eberhart LH, Morin AM, Wulf H, Geldner G. Patient preferences for immediate postoperative recovery. Br J Anaesth 2002 Nov;89(5): 760-1
21. Urusopone P, Sirichotvithyakorn P, Sindhvananda W, Charuluxananan S. Comparative study of the efficacy and side effects of oral rofecoxib, intrathecal morphine with local anesthetics and intrathecal local anesthetics in patients undergoing anorectal surgery in first 24 hours. Chula Med J 2004 Jan;48(1):23-30