Pain Reduction of a Pain Management Regimen in Orthopedic Patients at Lamphun Hospital

Choochat Kantayaporn MD*, Jayanton Patumanond PhD**,
Chamaiporn Tawichasri PhD**, Thanin Chattrapiban PhD**

** Department of Orthopedics, Lamphun Hospital, Lamphun, Thailand*
*** Division of Clinical Epidemiology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand*

Background: *VAS pain score is an effective method to evaluate patients. Pain control regimens are varied and rarely evaluated. The objective of this study is to evaluate the clinical benefit of pain control regimens using a visual analogue scale during hospital stays.*
Material and Method: *The retrospectively comparative time-series study was used. A total of 509 adult orthopaedic patients admitted between September 2006 and February 2007 were included. The average VAS pain score during the hospital stays and the length of hospital stay for each patient were evaluated. Exact probability tests, rank sum tests were used to compare the two groups. To adjust for any discrepancies in prognostic factors between the two groups, a regression analysis was employed.*
Results: *The VAS average pain score was significantly 33% less in the regimen application group (OR = 0.67, 95% CI = 0.49-0.91, p = 0.015), but length of hospital stays were similar (p = 0.836). After adjusting for the differences in percentage of operative procedures and anxiety, and simultaneously controlling for gender and age, the chance of patients who have moderate pain level or worse was reduced by 40% (OR = 0.60, 95% CI = 0.59-0.61, p < 0.001).*
Conclusion: *The pain regimen was found to be effective in pain reduction. However, the length of hospital stays was not reduced by this regimen as it may be affected by many other factors.*

Keywords: *Pain scale, Pain control, Pain regimen, Pain reduction, Pain management*

J Med Assoc Thai 2009; 92 (Suppl 6): S217-20
Full text. e-Journal: *http://www.mat.or.th/journal*

Ability to control pain is a major clinical problem in most patients with pain-associated conditions. The visual analogue pain scale is an effective tool to evaluate pain and is generally used. The regimens for pain management are varied and rarely were evaluated for their effectiveness. The American College of Physicians used the treatment regimen in order to titrate the analgesic dose. Mild pain (VAS pains core = 1-3) can usually be satisfactorily controlled with aspirin, acetaminophen or non-steroidal anti-inflammatory drugs (NSAIDs). In moderate pain (VAS pain score = 4-6), the low-dose opioid drugs added to aspirin, acetaminophen or NSAID regimens can effectively reduce pain. For severe pain (VAS pain score = 7-10) the treatment commonly requires the use of higher dose of opioid drugs at the same time as aspirin, acetaminophen or NSAIDs are continued as the co-analgesics. At any of the steps in the WHO Analgesic Ladder, the adjuvant therapy may provide additional relief[1]. Although many pain regimens were well described, they were seldom used[2].

The Orthopedic Department of Lamphun Hospital created the "pain regimen" using visual analogue pain scale as a standing order for the pain treatment in patients with an aim to achieve the early pain response and the reduction of narcotics use. For VAS pain score 0-3, the patients were asked whether or not they require the analgelsic drug use. If they said "yes", then the acetaminophen 1,000 mg is given. For VAS pains score 4-6, the patients were routinely prescribed with acetaminophen 1,000 mg. In those patients with VAS pain score 7-8, diclofenac sodium injection was administered. In most sever pain (VAS

Correspondence to: Kantayaporn C. Orthopedic Unit, Lamphun Hospital, Ampur Meung, Lamphun 51000, Thailand. Phone: 053-569-100. E-mail: chootuan@yahoo.com

pain score = 9-10), the attending nurse asked the in-charged physician for narcotics prescription. The objective of this study is to evaluate the effectiveness of the above mentioned regimen for pain control during hospital stays.

Material and Method

The retrospectively comparative time-series study design was used. All adult orthopedic in-patients (age > 15 years) who stayed in the hospital for more than 4 days were included. The diagnosis was classified using ICD-10 in five categories as arthropathy (osteoarthrosis, gouty arthritis), connective tissue disease (rheumatoid arthritis), spinal disease (spinal stenosis, herniated nucleus pulposus, spondylosis, spondylolisthesis), osteopathy (osteomyelitis) and injuries (fracture, dislocation, sprain, strain). The index patients (regimen group) were those whose admissions occurred during the 3 months before the "pain regimen" were implemented which was September 2006-November 2006 and the reference patients (Non-regimen group) were those patients admitted during 3-months after the implementation of pain regimen (December 2006-February 2007). Patients with admissions partly covered November 2006-December 2006 were excluded. Anxiety status were also evaluated by using the questionnaires introduced by the department of Mental Health, Ministry of Public Health. The average pain scale during the hospital stays and the length of hospital stay for each patient were evaluated. Exact probability tests, rank sum tests were used to compare the two groups. To adjust for any discrepancies in prognostic factors between the two groups, a regression analysis was used to quantify the "pain regimen" effect.

Results

During the study periods, 256 patients were included in the regimen group and 253 in the non-regimen group. There were no differences in gender, age, diagnosis and underlying medical diseases between these two groups. Anxiety status in the regimen group was more frequently reported than in the non-regimen group. The operative procedures were significantly less in the regimen group. The average pain scale was significantly 33% less in the regimen group (OR = 0.67, 95% CI = 0.49-0.91, p = 0.015), but the length of hospital stay was found insignificantly different (p = 0.836).

After adjusting for the differences in percentage of operative procedures and anxiety, and simultaneously controlling for gender and age, the chance of patients who have moderate pain level or worse was significantly reduced by 40% (OR = 0.60, 95% CI = 0.59-0.61, p < 0.001). The absolute percentage

Table 1. Patients' characteristics

Characteristics	Regimen group		Non-regimen group		p-value
	n	%	n	%	
Gender					0.478
Male	138	53.9	128	50.6	
Female	118	46.1	125	49.4	
Age (year)	53.9	(19.3)	51.1	(19.8)	
15-34	56	21.9	44	17.4	
35-54	103	40.2	110	43.5	
>55	97	37.9	99	39.1	
Mean (SD)	53.9	(19.3)	51.1	(19.8)	0.112
Underlying medical disease					0.843
No	185	72.3	185	73.1	
Yes	71	27.7	68	26.9	
Mental status					0.017
Normal	141	55.1	112	44.3	
Anxiety	115	44.9	141	55.7	
Operative procedure					0.041
No	64	25.0	85	33.6	
Yes	192	75.0	168	66.4	0.041

Table 2. Professional diagnosis of the study groups

ICD-10 Diagnosis	Regimen group		Non-regimen group		p-value
	n	%	n	%	
Anthropathy	4	1.6	8	3.2	0.875
Connective tissue disorder	3	1.2	1	0.4	
Spinal diseases	105	41.0	129	50.9	
Osteopathy	10	3.9	15	5.9	
Injuries	126	49.5	94	37.2	
Others	3	1.2	2	0.8	

Table 3. Averaged pain score and length of hospital stay of the study groups

Characteristics	Regimen group		Non-regimen group		p-value
	n	%	n	%	
Pain score					
0-3	206	80.5	179	70.7	
4-6	50	19.5	73	28.8	
> 6	0	0	1	0.5	
Mean (SD)	3.1	(1.1)	3.3	(1.1)	0.003
Length of hospital stay (day)					
4-8	112	43.7	120	47.3	
9-12	106	41.4	99	39.1	
13-16	24	9.4	23	9.1	
> 17	14	5.5	11	4.5	
Mean (SD)	9.8	(5.8)	9.3	(5.3)	0.176

reduction of patients suffering from moderate pain or worse was approximately 8.9 (95% CI = 8.2-9.7, $p < 0.001$).

Discussion

Patients in The Orthopedic Department of Lamphun hospital had been evaluated for pain, using the visual analogue pain scale since February 2006. For the regimens application, The score was classified into 4 categories; mild (0-3), moderate (4-6), severe (7-8) and intolerable (9-10). Some authors claimed that the visual analog pain scale cannot entirely discriminate between those patients who do and do not require analgesia[3], but some authors suggested that the visual analogue pain scale is advantageous to treatment trials because it permits the use of parametric statistics[4].

The pain regimen was created and implemented in Lamphun hospital in December 2006 as a standing order, in addition to the usual pain prescriptions. In the present study, the patients in the regimen group received more operative procedures than the non-regimen group, but reported less anxiety status. This findings was similar to the study results reported by Poisson-Salomon et al[5]. After taking these discrepancies into account and simultaneously controlling for gender and age, the logistic regression showed that after the pain regimen was applied, the chance of patients who have moderate pain level or worse was reduced by 40% and the absolute percentage reduction of patients suffering from moderate pain or worse was 8.9. This implies that 11 patients are needed to be treated as such in order to have 1 patient who satisfactory pain controlling from the treatment (number needed to treat, NTT = 11, 95% CI = 10-12). The regimen used in our study was consistent to many recommendations that medications should be applied to those cases with pain levels up to 4[6,7]. However, it should be noticed that the length of hospital stays

were not reduced by our pain regimen, as it may be affected by many other factors which were not included in our scope of analysis.

Conclusion

Pain reduction resulting from this pain regimen assessed by the visual analogue pain score is considered clinically effective, but the overall effectiveness including effect on hospital stay which could be reduce from the effective pain controlling is still questionable. Further study is needed to confirm this postulation.

Acknowledgment

The authors wish to thank Chitlada Sripanya, Taksina Chaiwattana, Panpanit Sukawarotwat and Piyaporn Meerit, the 5th year medical students of Chiang Mai University (academic year 2006) for their assistance in data collection.

References

1. The American College of Physicians. Managing pain [database on the Internet]. 2004 [cited 2007 Oct 8]. Available from: http://www.acponline.org/journals/news/dec04/pain/managing.htm.
2. Vallano A, Malouf J, Payrulet P, Ba□os JE; Catalan Research Group for the Study of Pain in the Hospital. Analgesic use and pain in the hospital settings. Eur J Clin Pharmacol 2007; 63: 619-26.
3. Blumstein HA, Moore D. Visual analog pain scores do not define desire for analgesia in patients with acute pain. Acad Emerg Med 2003; 10: 211-4.
4. Au E, Loprinzi CL, Dhodapkar M, Nelson T, Novotny P, Hammack J, O'Fallon J. Regular use of a verbal pain scale improves the understanding of oncology inpatient pain intensity. J Clin Oncol 1994; 12: 2751-5.
5. Poisson-Salomon AS, De Chambine S, Lory C. Patient-related factors and professional practices associated with postoperative pain. Rev Epidemiol Sante Publique 2005; 53: 1S47-56.
6. Giesa M, Drees P, Meurer A, Jage J, Eckardt A. Standardised postoperative analgesic system in orthopedic surgery. Z Orthop Ihre Grenzgeb 2006; 144: 267-71.
7. Silka PA, Roth MM, Moreno G, Merrill L, Geiderman JM. Pain scores improve analgesic administration patterns for trauma patients in the emergency department. Acad Emerg Med 2004; 11: 264-70.

ผลการลดความปวดโดยใช้โปรแกรมยาแก้ปวดในผู้ป่วยโรคกระดูกและข้อโรงพยาบาลลำพูน

ชูชาติ ขันตยาภรณ์, ชยันต์ธร ปทุมานนท์, ชไมพร ทวิชศรี, ธานินทร์ ชาตระภิบาล

ภูมิหลัง: *มีการใช้โปรแกรมยาแก้ปวดสำหรับผู้ป่วย โดยอ้างอิงระดับความปวดที่ผู้ป่วยเป็นผู้ประเมินเอง กันอย่างแพร่หลาย แต่การประเมินผลการลดความปวดของโปรแกรมเหล่านี้ยังมีไม่มาก กลุ่มงานออร์โธปิดิกส์ โรงพยาบาลลำพูนได้คิดโปรแกรมการให้ยาเพื่อตอบสนองผู้ป่วยให้รวดเร็วและลดการใช้ยาแก้ปวดที่มีฤทธิ์กดประสาท*

วัตถุประสงค์: *การศึกษานี้เพื่อประเมินผลการลดความปวดของผู้ป่วยระหว่างที่รักษาตัวอยู่ในโรงพยาบาล ผู้ป่วยอายุมากกว่า 15 ปี ที่นอนโรงพยาบาลมากกว่า 4 วันขึ้นไป 3 เดือนก่อนเริ่มใช้โปรแกรมจำนวน 253 ราย และ 3 เดือนหลังใช้โปรแกรมจำนวน 256 ราย เปรียบเทียบกัน*

ผลการศึกษา: *พบว่าระดับความปวดโดยเฉลี่ยตลอดระยะเวลาที่นอนโรงพยาบาลของผู้ป่วยที่ใช้โปรแกรมลดลง 33% อย่างมีนัยสำคัญทางสถิติ (OR = 0.67, 95% CI = 0.49-0.91, p = 0.015) หลังจากได้ปรับปัจจัย ที่อาจมีผลต่อระดับความปวด ได้แก่ ความวิตกกังวล และการได้รับการผ่าตัดก็ยังพบว่า ระดับความปวดของผู้ป่วยโดยเฉพาะความปวดระดับปานกลางลดลง 40% อย่างมีนัยสำคัญทางสถิติ (OR = 0.60, 95% CI = 0.59-0.61, p < 0.001)*

สรุป: *โปรแกรมการให้ยาแก้ปวดนี้มีผลดีในการลดอาการปวด แต่ ไม่มีผลต่อระยะเวลาที่นอนโรงพยาบาลของผู้ป่วย*