Prevalence and Conditions Associated with Neuropathic Pain in Orthopaedic Patients of Bangkok Metropolitan Administration General Hospital

Somkiat Yongyingsakthaworn, MD, Natcha Kulsiriitthikorn, BNS

Department of Orthopedics, Bangkok Metropolitan Administration General Hospital, Bangkok, Thailand

Purpose: Neuropathic pain results from a primary lesion or dysfunction in the nervous system. Diagnosing neuropathic pain can be difficult, however, this condition is common in clinical practice. There is limited information on the prevalence of neuropathic pain in the Thai orthopaedic departments. The objective of this study was to investigate the prevalence of neuropathic pain and association factors in the orthopaedic out-patient clinic, Bangkok Metropolitan Administration (BMA) Hospital.
Methods: A cross-sectional study of 400 patients attending the orthopaedic out-patient clinic, BMA hospital was conducted. The Thai DN4 questionnaire was used for the diagnosis of neuropathic pain. Main diagnosis and co-morbidities were recorded. Descriptive statistics were used to provide the basic information. The Chi-square test was applied for the association and binary logistic regression was used for multivariate analysis.
Results: The prevalence of neuropathic pain was 22.3%. The missed diagnosis rate was found to be 16.2%. There was statistically significant association between neuropathic pain and nerve entrapment.The most common symptoms used in practice by physicians for the diagnosis of neuropathic pain were reported as tingling (92.1%), pins and needles (78.7%) and numbness (70.8%) in this study.
Conclusion: This study demonstrated a need to increase awareness of neuropathic pain in orthopaedic out-patient clinics. Health care providers should promote the DN4 questionnaire to diagnose neuropathic pain in clinical practice.

Keywords: Neuropathic Pain, orthopaedic, out-patient clinic

The Thai Journal of Orthopaedic Surgery: 37 No.2-4: 43-47
Full text. e journal: *http://www.rcost.or.th, http://thailand.digitaljournals.org/index.php/JRCOST*

Introduction

Neuropathic pain can be defined as "pain initiated or caused by a primary lesion or dysfunction in the nervous system"[1]. In clinical practice, neuropathic pain can be found in many conditions such as traumatic conditions, neurological diseases, post-operative conditions and cancer. The prevalence of neuropathic pain has been reported differently ranging from 6.8-48.0% depending on where the studies were performed and the associated conditions. Most of the studies were performed outside of Thailand. There is limited information on the study of the prevalence of neuropathic pain in the Thai orthopaedic department. Diagnosing neuropathic pain can be difficult, however, this condition is common in clinical practice[2-6]. Under-evaluation and inadequate treatment results in a low quality of life[7-10]. The prevalence of neuropathic pain and its association factors in the orthopaedic department are important information to improve awareness and the efficacy of treatment.

Correspondence to: Yongyingsakthaworn S, Department of Orthopedic Surgery, Bangkok Metropolitan Administration General Hospital, Bangkok, Thailand
E-mail: somkiatsi34@yahoo.com

Patients and methods

This cross-sectional descriptive study was conducted in the Department of Orthopaedics, Bangkok Metropolitan Administration General Hospital in December 2012. The present study was approved by the Ethical Committee of Bangkok Institution. The sample size estimation was calculated using the prevalence of 10% from the literature. The sample size required can be calculated according to the following formula:

$$n = \frac{Z^2_{\alpha/2} P(1-P)}{d^2}$$

n = Sample size
P = The expected prevalence value from literature reviews (0.1)
d = Acceptable margin of error (0.03)
$Z_{\alpha/2}$ = Area under normal curve corresponding to the 95% confidence level (1.96)

For a prevalence study, 385 participants were needed. Four hundred out-patient participants from the orthopaedic clinic were recruited in office hours (Monday to Friday, 9.00-16.00) by simple random sampling generated from a computer. All patients signed an informed consent form prior to

their participation in the study. Inclusion criteria were all patients who were aged above 18 years old and willing to be completely interviewed and examined. Exclusion criteria were psychiatric disorder and reattending patients. Data collection [Patients' demographic profiles, history of recent surgery, history of co-existing medical diseases and the Thai version of the DN4 questionnaire (interview part)] was performed by an orthopaedic nurse. The patients underwent a regular physical examination, diagnosis, and treatment by a randomized orthopaedic surgeon. Then, an orthopaedic nurse collected the data [main diagnosis and the DN4 questionnaire (physical examination part)]. After all the data were collected, neuropathic pain was diagnosed by a score equal or more than 4 in the Thai version of the DN4 questionnaire. This questionnaire was passed through systematic translation and validation processes[11-12].

Statistical analysis

The quantitative data were analysed by the mean values and standard deviation. Chi-square was used to test the association between two qualitative variables. Binary logistic regression was used for the analysis of multivariate data. The level of statistical significance was set at $P<0.05$.

Results

In December 2012, 3,932 patients attended the orthopaedic out-patient clinic, BMA hospital. Four hundred patients were included. One hundred and forty one (35.3%) were male and 259 (64.8%) were female. The demographic data are shown in table 1. The prevalence of neuropathic pain was 22.3% and missed diagnosis was found to be 16.2%. Most of the main diagnoses were myofascial pain, degenerative disease and nerve entrapment conditions accounting for 24.8%, 23.0% and 19.8%, respectively. Tingling (92.1%), pins and needles (78.7%), and numbness (70.8%) were the most common symptoms of neuropathic pain. Neuropathic pain characteristics are shown in table 2. The associated condition for neuropathic pain was nerve entrapment as shown in table 3.

Table 1 Characteristics of participants (n = 400)

			Neuropathic pain (n=89)	**No Neuropathic Pain (n = 311)**
Age* (years)			58.1±11.6 (19 to 88)	57.4±14.8 (19 to 89)
Sex	Female		56 (62.9%)	203 (65.3%)
	Male		33 (37.1%)	108 (34.7%)
Weight*(kg)			62.6±11.5 (39 to 98)	62.9±12.0 (35 to 99)
Height*(cm)			158.7±7.6 (140 to 171)	157.3±9.1 (135 to 180)
Main diagnosis	Traumatic condition	(i.e. fracture, tissue injury)	4 (1.0%)	44 (11.0%)
	Post-surgical condition	(only orthopaedic surgery)	14 (3.5%)	25 (6.3%)
	Tendinitis disease	(i.e. tenosynovitis)	6 (1.5%)	47 (11.8%)
	Inflammatory disease	(i.e. RA, gout)	1 (0.3%)	9 (2.3%)
	Myofascial pain		37 (9.3%)	62 (15.5%)
	Nerve entrapment	(i.e. CTS, spinal stenosis)	54 (13.5%)	25 (6.3%)
	Degenerative disease	(i.e. osteoarthritis)		
	Pain more than 6 wks		2 (0.5%)	12 (3.0%)
	Pain less than 6 wks		10 (2.5%)	68 (17.0%)
Comorbidities	Hypertension		19 (4.8%)	71 (17.8%)
	Diabetes mellitus		18 (4.5%)	33 (8.3%)
	Dyslipidemia		4 (1.0%)	32 (8.0%)
	Others		63 (15.8%)	245 (61.3%)

*The values are given as the mean ± SD with the range
CTS carpal tunnel syndrome, *RA* rheumatoid arthritis

Table 2 Neuropathic pain characteristics

Characteristics of pain	n	%
Burning	60	67.4
Painful cold	22	24.7
Electric shocks	49	55.1
Tingling	82	92.1
Pins and needles	70	78.7
Numbness	63	70.8
Itching	19	21.4
Hypoesthesia to touch	30	33.7
Hypoesthesia to prick	25	28.1
Brushing	13	14.6

Table 3 Associated conditions for neuropathic pain

	Univariate Analysis		Multivariate Analysis	
	OR (95%CI)	*P*-value	OR (95%CI)	*P*-value
Traumatic condition	0.2 (0.1-0.3)	0.01*	…	…
Post surgical condition	2.2 (1.1-4.5)	0.02*	2.3 (1.0-5.5)	0.05
Tendinitis	0.2 (0.1-0.3)	0.001*	…	…
Inflammatory disease	1.4 (0.5-3.1)	0.34	…	…
Myofascial pain	0.3 (0.1-0.6)	0.001*	…	…
Nerve entrapment	17.0 (9.6-29.9)	0.001*	15.6 (8.5-28.6)	0.001*
Degenerative disease	0.5 (0.2-0.9)	0.015*	…	…
Hypertension	0.9 (0.5-1.6)	0.76	…	…
Diabetes mellitus	2.6 (1.4-4.8)	0.002*	…	…
Dyslipidemia	0.3 (0.1-0.7)	0.003*	…	…

CI confidence interval, *OR* odds ratio

* Indicates statistically significant

… Indicates not statistically significant in multivariate analysis

Discussion

The prevalence of neuropathic pain has been reported differently depending on where studies were performed and the associated conditions**.** The prevalence of neuropathic pain in the general population was found to be 6.8-8.2% in European countries[13]. There is little information on the prevalence of neuropathic pain in the Thai orthopaedic department. Neuropathic pain was reported at the Siriraj pain clinic to be 37.8-48.0%[14]. The prevalence of neuropathic pain was reported to be 36% in cancer patients, 10-15% in patients with postherpetic neuralgia, 13-38% in patients with spinal cord injury, 20% in post mastectomy syndrome patients and 16-26% in diabetic patients[15-20]. This study reported 22.3% of patients had neuropathic pain and 16.2% were considered a missed diagnosis of this condition in the orthopaedic out-patient clinic. The patients in this study reported tingling (92.1%), pins and needles (78.7%) and numbness (70.8%) as the most common symptoms of neuropathic pain which can be used by physicians for the early detection of neuropathic pain. Univariate analysis of the associated factors for neuropathic pain was found statistically significant with traumatic conditions, post-surgical, tendinitis disease, muscular-myofascial pain, degenerative conditions, nerve entrapment condition, diabetes mellitus and dyslipidemia. In multivariate analysis, we showed nerve entrapment conditions were the only statistically significant factors associated with neuropathic pain. The sample size was formulated for a prevalence study but 400 participants were sufficient for association analysis. The limitation of this study is that it is cross-sectional in design and therefore cannot establish the causal relationship.

Conclusion

Neuropathic pain is a common condition in orthopaedic out-patient clinics. The present study emphasised on increase awareness of neuropathic

pain in an orthopaedic out-patient clinic. Health care providers should promote the DN4 questionnaire to diagnose neuropathic pain in clinical practice.

Acknowledgements

The authors wish to thank all of the orthopaedic surgeons who took part in this study and BMA hospital for completing the Thai version of DN4 questionnaire.

Potential conflicts of interest

None

References

1. Treede R-D, Jensen TS, Campbell JN, Cruccu G, Dostrovsky JO, Griffin JW, et al. J. Neuropathic pain: Redefinition and a grading system for clinical and research purposes. Neurology 2008; 70; 1630-35.
2. Hansson P. Neuropathic pain: clinical characteristics and diagnostic workup. Eur J Pain 2002; 6: 47-50.
3. Jensen TS, Gottrup H, Sindrup SH, Bach FW. The clinical picture of neuropathic pain. Eur J Pharmacol 2001; 429: 1-11.
4. Galer BS, Dworkin RH. A clinical guide to neuropathic pain. Minneapolis(MN): McGraw-Hill; 2000: 4-6.
5. Dworkin RH. An overview of neuropathic pain: syndromes, symptoms, signs, and several mechanisms. Clin J Pain 2002; 18: 343-9.
6. Dworkin RH, Backonja M, Rowbotham MC, Allen RR, Argoff CR, Bennet GJ, et al. Advances in neuropathic pain: diagnosis, mechanisms, and treatment recommendations. Arch Neurol 2003; 60: 1524-34.
7. Stevens PE, Dibble SL, Miaskowski C. Prevalence characteristics and impact of postmastectomy pain syndrome: an investigation of women's experiences. Pain 1995; 61: 61-8.
8. Jensen MP, Chodroff MJ, Dworkin RH. The impact of neuropathic pain on health-related quality of life: review and implications. Neurology 2007; 68: 1178-82.
9. Meyer-Rosberg K, Kwanstrom A, Kinnman E, Gordh T, Nordfos LO, Kristofferson A. Peripheral neuropathic pain- a multidimensional burden for patients. Eur J Pain 2001; 5: 379-89.
10. Berger A, Dukes EM, Oster G. Clinical characteristics and economic costs of patients with painful neuropathic disorders. J Pain 2004; 5: 143-9.
11. Bouhassir, Attal N, Alchaar H, Boureau F, Bruxelle J, Cunin G, et al. Comparison of pain syndromes associated with nervous or somatic lesion and development of new neuropathic pain diagnostic questionnaire(DN4). Pain 2005; 114: 29-36.
12. Chaudakshetrin P, Prateepavanich P, Chira-Adisai W, Tassanawipas W, Leechavengvongs S, Kitisomprayoonkul W. Cross-cultural adaption to the Thai language of the neuropathic pain diagnostic questionnaire (DN4). J Med Asso Thai 2007; 90: 1860-65.
13. Torrance N, Smith BH, Bennett MI, Lee AJ. The epidemiology of chronic pain of predominantly neuropathic origin. Results from a general population survey. J Pain 2006; 7: 281-9.
14. Chaudakshetrin P. A neuropathic pain survey at Siriraj Pain Clinic. J Med Assoc Thai 2006; 89: 354-61.
15. Grond S, Radbruch L, Meuser T, Sabatowski R, Loich G, Lehmann KA. Assessment and treatment of neuropathic cancer pain following WHO guidelines. Pain 1999; 79: 15-20.
16. Dubinsky RM, Kabbani H, El-Chami Z, Boutwell C, Ali H. Practice parameter: treatment of postherpatic neuralgia: an evidence-based report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology 2004; 63: 959-65.
17. Werhgen L, Budh CN, Hulting C, Molander C. Neuropathic pain after traumatic spinal cord injury- relations gender, spinal level, completeness, and age at the time of injury. Spinal Cord 2004; 42: 665-73
18. Werhgen L, Hutling C, Molander C. The prevalence of neuropathic pain after non-traumatic spinal cord lesion. Spinal Cord 2007; 45: 609-15.
19. Stevens PE, Dibble SL, Miaskowski C. Prevalence characteristics and impact of postmastectomy pain syndrome: an investigation of women's experiences. Pain 1995; 61: 61-8.
20. Jensen TS, Backonja MM, Hernandez Jimenez S, Tesfaye S, Valensi P, Ziegler D. New perspectives on the management of diabetic peripheral neuropathic pain. Diab Vasc Dis Res 2006; 3: 108-19.

ความชุกและภาวะที่สัมพันธ์กับการปวดเหตุจากพยาธิสภาพประสาทในผู้ป่วยศัลยกรรมกระดูกของโรงพยาบาลกลาง

สมเกียรติ ยงยิ่งศักดิ์ถาวร, พบ, นัชชา กุลสิริอิทธิกร, พยบ

วัตถุประสงค์*: ศึกษาความชุกรวมถึงความสัมพันธ์ของภาวะที่เกี่ยวข้องกับภาวะปวดเหตุจากพยาธิสภาพประสาทในผู้ป่วยที่มารับการรักษาแบบผู้ป่วยนอก แผนกศัลยกรรมกระดูก*

วิธีการศึกษา*: ทำการศึกษาตัดขวาง (cross-sectional) ในผู้ป่วย 400 คนที่เข้ารับการรักษาแบบผู้ป่วยนอก แผนกศัลยกรรมกระดูก โรงพยาบาลกลาง ในเวลาทำการ 9.00-16.00 น วันจันทร์ถึงศุกร์ โดยสุ่มเลือกจากคอมพิวเตอร์พยาบาลประจำแผนกทำการบันทึกข้อมูลพื้นฐาน อาการนำ โรคร่วม และประเมินแบบสอบถาม DN4 ฉบับภาษาไทย (ส่วนสัมภาษณ์) หลังจากนั้นผู้ป่วยเข้ารับการตรวจรักษาตามปรกติและได้รับการประเมินแบบสอบถาม DN4 ฉบับภาษาไทย (ส่วนตรวจร่างกาย) โดยแพทย์ศัลยกรรมกระดูก หลังจากนั้นพยาบาลประจำแผนกรวบรวมข้อมูลทั้งหมดและวินิจฉัยการปวดเหตุจากพยาธิสภาพประสาทเมื่อคะแนนจากแบบสอบถาม DN4 ฉบับภาษาไทย มากกว่าหรือเท่ากับ 4 โดยแบบสอบถาม DN4 ฉบับภาษาไทยมีการทดสอบความถูกต้องในการแปลเป็นภาษาไทยแล้ว คำนวณค่าสถิติพื้นฐาน ใช้สถิติไคสแควร์ เพื่อคำนวณการเปรียบเทียบ และใช้โลจิสติก รีเกรทชั่น สำหรับการวิเคราะห์หลายตัวแปร

ผลการศึกษา*: อัตราความชุกของการปวดเหตุจากพยาธิสภาพประสาท ในผู้ป่วยที่มารับการรักษาแบบผู้ป่วยนอก แผนกศัลยกรรมกระดูก พบร้อยละ 22.3 พบอัตราการวินิจฉัยผิดพลาด ร้อยละ 16.2 ผู้ป่วยที่มีเส้นประสาทถูกกดทับ มีความสัมพันธ์กับการปวดเหตุจากพยาธิสภาพประสาทมีความสัมพันธ์กันอย่างมีนัยสำคัญทางสถิติ อาการชาเหมือนเป็นเหน็บ (ร้อยละ 92.1), อาการเจ็บชาคล้ายเข็มตำ (ร้อยละ 78.7), ชาไร้ความรู้สึก (ร้อยละ 70.8) เป็นอาการที่พบได้บ่อยที่สุดและเหมาะสำหรับใช้สังเกตในการตรวจทางคลินิก*

สรุป*: การปวดเหตุจากพยาธิสภาพประสาท ในผู้ป่วยที่มารับการรักษาแบบผู้ป่วยนอก แผนกศัลยกรรมกระดูก พบได้บ่อยและมีการวินิจฉัยพลาดได้ การศึกษาบ่งชี้ว่าควรมีความตระหนักถึงภาวะดังกล่าวมากขึ้น และควรสนับสนุนให้ใช้แบบสอบถาม DN4 เพื่อการวินิจฉัยการปวดเหตุพยาธิสภาพประสาทในแผนกผู้ป่วยนอก*