Validation Study of the Thai ID Pain Scale

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Objective: *To translate the ID Pain scale into Thai and validate this scale.*
Material and Method: *The 6-item ID Pain scale was translated into Thai. The final version was tested in 100 patients. Sensitivity, specificity, and predictive validity were calculated.*
Results: *Twenty-four patients were neuropathic, 49 were nociceptive and 27 were mixed pain. Forty-six patients have chronic pain. Seventy-five were female. Sensitivity and specificity for diagnosis of neuropathic pain were 83% and 80%. The predictive validity using area under the ROC curve of the neuropathic, mixed and nociceptive pain groups were 0.890 (95% CI 0.824-0.955), 0.587 (95% CI 0.464-0.709) and 0.147 (95% CI 0.071-0.224), respectively.*
Conclusion: *The Thai ID Pain scale is brief, convenient to complete and had good predictive validity for screening of neuropathic pain. Prediction validity of mixed pain is moderate and of nociceptive pain is low.*

Keywords: *Neuropathic pain, Diagnostic tools, Psychometric assessment*

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Regarding to the definition defined by the International Association for the Study of Pain (IASP), neuropathic pain is initiated or caused by a primary lesion or dysfunction of the nervous system[1]. Prevalence in the general population is 6.8-8.2%[2]. Survey of patients who attended the pain clinic found that 37.8-48% of them had neuropathic pain[3,4]. Neuropathic pain manifested after peripheral and central lesions ranged from 8 to 38% depended on specific diseases[5-11]. There is no pathognomonic sign. So neuropathic pain screening is important, challenging and had therapeutic relevance, especially in general practitioners who are not familiarized with this type of pain.

Recently, the short-form McGill Pain Questionnaire was translated into Thai[12]. Although it is useful for general pain assessment, it is not specific for neuropathic pain. The Thai Language of Neuropathic Pain Diagnostic Questionnaire (DN4), the first neuropathic pain assessment tool translated into Thai, was validated for clinical use[13]. It is a simple tool but needed physical examination. Various neuropathic pain screening tools have been created[14]. One of them is the ID Pain scale. It is a brief, self-administered screening tool[15]. It does not require physical examination the same as the Neuropathic Pain Questionnaire (NPQ) and the pain DETECT. The ID Pain also has least items among all neuropathic pain screening tools.

The aim of the present study was to translate an original English version of the ID Pain scale into Thai and validate this scale. The Thai version may use to identify patients who tend to have a neuropathic pain. It may be used in various settings, *e.g.* primary care setting, telephone interviewing, or self-assessment via webpage.

Material and Method

Participants

One hundred patients participated in the validation study. They were recruited from the outpatient department of rehabilitation medicine. The protocol was approved by the Institutional Review Boards. All participants gave their written informed consent. Patients aged more than 18 years old with moderate pain intensity were included in the present study. Patients were excluded if they had a communication or cognitive impairment which precluded administering of the questionnaire and who had a history of psychiatric diseases.

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Development and validation of the Thai ID Pain

The ID Pain scale was translated with permission from Professor Russell Portenoy, Department of Pain Medicine and Palliative Care, Beth Israel Medical Center, New York, United State of America. There is a 6-item questionnaire. The first 4-item was not translated. The Thai words in the DN4 (Thai version) were used in the Thai ID Pain scale because there are translated from the same original words (pins and needles, hot/burning, numb, electrical shocks). Item-5 and -6 are the only two items newly translated. The draft version was piloted in 10 patients who had pain at the outpatient department of rehabilitation medicine. Item-5 and -6 were a little bit revised. The final version of Thai ID Pain scale (see appendix) was tested in 100 patients.

Patients were asked to complete the Thai ID Pain scale first; thence an author immediately reviewed the medical record to find out the diagnosis. Pain diagnosis was based on medical records of physiatrists with extensive experience. Pain was categorized into one of pain type *i.e.* neuropathic, nociceptive and mixed[15]. Acute pain was defined as pain less than 6 months. Continued pain more than 6 months was defined as chronic pain.

Scoring of the 6-item Thai ID Pain scale is defined. "Yes" answers to item 1-5 were scored as 1, while a "yes" answer to item 6 was scored as -1. "No" answer were scored as 0. Total score is range from -1 to 5. Higher score suggested neuropathic pain component.

Statistical analysis

Demographic data, pain type and acute/chronic pain category were reported by number and percentage, mean and standard deviation (SD). Correlation coefficients were used to measure the relation between total score and items of the Thai ID pains. $p < 0.05$ was set for significant. Cronbach's alpha was used to evaluate an internal consistency. The predictive validity was estimated using receiver operator characteristic (ROC) curves. Cut-off point based on the sensitivity and specificity were calculated. SPSS statistic program (version 13.0 SPSS Inc., Chicago, IL, USA) was used to analyze data.

Results

Of 100 patients, 24 were neuropathic, 49 were nociceptive and 27 were mixed pain. Forty-six patients had chronic pain. Mean age of patients with neuropathic, nociceptive and mixed pain were 51.3 ± 15.5, 51.3 ± 15.2 and 53.9 ± 13.7 years, respectively. Seventy-five were female. Demographic data are shown in Table 1. Etiologies of pain are shown in Table 2.

Correlation coefficients of total score and item 1-6 of the Thai ID Pain were 0.690, 0.580, 0.444, 0.516, 0.307 and 0.414, respectively ($p < 0.001$). Cronbach's alpha of the Thai ID Pain scale is 0.318. Seventy percent of patients with neuropathic pain answer 'yes' in item-2 and 3. Item-6 is the most frequent item chosen by patients with either nociceptive or mixed pain. Forty percent of this group also had

Table 1. Demographic data of patients

Patient's demographic data	Pain type		
	Neuropathic (n = 24)	Nociceptive (n = 49)	Mixed (n = 27)
Age (year); mean ± SD	51.3 ± 15.5	51.3 ± 15.2	53.9 ± 13.7
Gender; n (%)			
Male	11 (45.8)	8 (16.3)	6 (29.2)
Female	13 (54.2)	41 (83.7)	21 (77.8)
Education; n (%)			
No	1 (4.2)	4 (8.2)	0 (0)
Primary school	10 (41.7)	6 (12.2)	8 (29.6)
Secondary school	2 (8.3)	10 (20.4)	5 (18.5)
Graduated	9 (37.5)	23 (46.9)	10 (37.0)
Postgraduates	2 (8.3)	6 (12.2)	4 (14.8)
Duration of pain; n (%)			
Acute (< 6 months)	7 (29.2)	30 (61.2)	17 (63.0)
Chronic (> 6 months)	17 (70.8)	19 (38.8)	10 (37.0)

Table 2. Etiology of pain

Pain type	n
Etiology of neuropathic pain (n = 24)	
Nerve injury	7
Spinal cord injury	7
Brachial plexus injury	5
Phantom limb pain	3
Post-stroke pain	2
Etiology of nociceptive pain (n = 49)	
Myofascial pain syndrome	13
Strain/sprain	7
Adhesive capsulitis	6
Arthritis	5
Fasciitis	5
Post-fracture	5
Tendinitis	4
Spondylosis	4
Etiology of mixed pain (n = 27)	
Spondylosis with radiculopathy	22
Herniated disc with radiculopathy	4
Post-fracture with nerve injury	1

Table 3. Item selection of each pain type

Item	Pain type		
	Neuropathic (n = 24) n (%)	Nociceptive (n = 49) n (%)	Mixed (n = 27) n (%)
1	15 (62.5)	5 (10.2)	11 (40.7)
2	17 (70.8)	4 (8.2)	8 (29.6)
3	17 (70.8)	11 (22.4)	12 (44.4)
4	13 (54.2)	8 (16.3)	8 (29.6)
5	9 (37.5)	13 (26.5)	11 (40.7)
6	7 (29.2)	27 (55.1)	13 (48.1)

Table 4. ID Pain score of each pain type

Score	Pain type		
	Neuropathic n (%)	Nociceptive n (%)	Mixed n (%)
-1	0 (0)	7 (14.3)	2 (7.4)
0	0 (0)	26 (53.1)	5 (18.5)
1	4 (16.7)	13 (26.55)	8 (29.6)
2	6 (25.0)	3 (6.1)	6 (22.2)
3	10 (41.7)	0 (0)	5 (18.5)
4	3 (12.5)	0 (0)	1 (3.7)
5	1 (4.2)	0 (0)	0 (0)
Total	24 (100)	49 (100)	27 (100)

chosen item-1, 3 and 5. Item selected by patients in each pain type are shown in Table 3. Eighty percent of the neuropathic pain group had a total ID Pain score ≥ 2. Only 6% of nociceptive and 40% of the mixed pain group scored ≥ 2. The ID Pain scores regarding pain type are shown in Table 4.

The predictive validity using the area under the ROC curve (AUC) of neuropathic, nociceptive and mixed pain are 0.890 (95% CI 0.824-0.955), 0.147 (95% CI 0.071-0.224) and 0.587 (95% CI 0.464-0.709), respectively. The most sensitive and specific of this scale was shown when using score ≥ 2 as a cut-off score. Sensitivity and specificity for diagnosis of neuropathic pain if total score ≥ 2 were 83% and 80%.

Discussion

The Thai ID Pain is valid for distinguishing neuropathic pain from nociceptive and mixed pain with high sensitivity and specificity. Large AUC of neuropathic pain group determines high predictive validity. Predictive validity for patients with mixed pain is moderate, and for patients with nociceptive pain is low. High sensitivity and specificity, which determines this scale, can screen and differentiate patient who has neuropathic pain from other pain types. Although the Thai version of Douleur Neuropathique en 4 questions (DN4) is already recommended as a neuropathic pain screening tool for Thai people[17], the Thai ID Pain scale has some advantage *i.e.* needed no physical examination. So this self-assessment scale can be used by non-specialist or public health personnel in community or primary care setting, via telephone interviewing, or self-assessment vie webpage. It may be suitable for epidemiologic pain study in a large area. High predictive validity of this scale assumed that data from patient self-assessment could be used to predict the pain type.

Item-1 'Did the pain feel like pins and needles?', item-2 'Did the pain feel hot/burning?', item-3 'Did the pain feel numb?', and item-4 'Did the pain feel like electrical shocks?' described neuropathic pain characteristics. Most of the patients with neuropathic pain were expected to answer "yes" for these first four items. Item-5 'Is the pain made worse with the touch of clothing or bed sheets?' described allodynia signs of neuropathic pain. Some patients with neuropathic pain were expected to answer "yes" for this item because allodynia can be elicited in most patients who have peripheral neuropathic pain, but not in patients who has central neuropathic pain and trigeminal neuralgia[16]. Item-6 'Is the pain limited to

your joints?' described the component mostly found in patients who have a musculoskeletal pain. Internal consistency, determined by Cronbach's alpha, is low. It may assume that the items themselves would be fairly well inter-correlated. However, the correlation of each item with the total score is moderate with statistical significance.

The items that more than 70% of patients who had neuropathic pain answer 'yes' are item-2 (feel hot/ burning) and -3 (feel numb). The least item that they answered 'yes' is item-6 (pain limited to the joint). The only item that patients that had nociceptive pain chose more than 50% is item-6, that reasonable. Patients who had mixed pain, for example spondylosis with radiculopathy, have both nociceptive and neuropathic pain components. Therefore, they chose item-1, -3, -5, and -6. However, chosen items are not as important as the total score. The predictive validity of total score, determined by area under the ROC curve (AUC), is high. Although the AUC of this scale is not as high as the DN4 questionnaire[18], validity for predicting neuropathic pain by patients who answer the Thai ID Pain scale by themselves is good. Predictive validity for patients who had mixed pain is fair, but not valid for detecting patients who have nociceptive pain. Therefore, when using this scale, a patient that has neuropathic and mixed pain could be ruled in and a patient with nociceptive pain could be ruled out. This advantage to distinguish mixed pain from other pain types is not indicated in the DN4[18], self-report Leeds Assessment of Neuropathic Symptoms and Signs (S-LANSS)[19] and pain DETECT scale[20]. The sensitive and specific are also high if using 2 for a cut-off score. Eighty percent of the neuropathic pain group had total ID Pain score ≥ 2. No one in this group had a score -1 to 0. Ninety-four percent of patients who had nociceptive pain had score ≤ 2. Six percent of this group had a score ≥ 2. Forty percent of the mixed pain group scored ≥ 2.

The limitation of the present study is small sample size, no comparison with English version of diagnostic tool and total score of this scale may have been influenced by treatments they have received or activities they have performed that were not controlled.

The cross-cultural adaptation to other languages provides a neuropathic pain screening/ diagnostic tool in each country. However, the translated version should be validated before clinical use. In the present study, a validation of the Thai ID Pain scale is proved. Test-retest reliability should be tested in the future. After that, epidemiologic study of neuropathic pain in the community using this scale should be implemented. Further study should purpose to identify patients who have predominately neuropathic component in the mixed pain group. This issue will help physicians to early detect neuropathic pain component in mixed pain condition. Therefore, early treatment can be started properly.

Conclusion

The Thai ID Pain scale is a brief tool, that is simple, easy and convenient to complete. It has a good sensitive and is valid for neuropathic pain screening. Physicians can use this scale for quick assessment before further detailed examination in suspected patients. There may be an advantage when using in various setting such as in primary care settings, telephone interviewing, or self-assessment via webpage.

Potential conflicts of interest

None.

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Appendix.

ภาคผนวก แบบประเมิน ID Pain **ฉบับภาษาไทย**

เติมเครื่องหมาย √ ในช่อง “มี” หรือ “ไม่มี” ตามอาการที่ท่านรู้สึกในช่วง 1 สัปดาห์ที่ผ่านมาท่านไม่ต้องเติมเลข หรือเครื่องหมายใด ๆ ในช่องคะแนนรวม

อาการ	มี	ไม่มี
- แปลบปลาบคล้ายเข็มตำ		
- ปวดแสบร้อน		
- ชาไร้ความรู้สึก		
- ปวดเหมือนถูกไฟช็อต		
- ปวดมากขึ้นเมื่อสัมผัสกับเสื้อผ้าหรือผ้าปูที่นอน		
- ปวดเฉพาะที่ข้อเท่านั้น		
คะแนนรวม		

การศึกษาความถูกต้องของแบบประเมิน ID Pain Scale ฉบับภาษาไทย

วสุวัฒน์ กิติสมประยูรกุล

วัตถุประสงค์: *เพื่อแปลแบบประเมิน ID Pain Scale เป็นภาษาไทย และศึกษาความถูกต้องของแบบประเมิน*

วัสดุและวิธีการ: *แปลแบบประเมิน ID Pain Scale ซึ่งมีข้อย่อย 6 ข้อเป็นภาษาไทย และทดสอบแบบประเมินกับผู้ป่วย 100 ราย จากนั้นหาความไว ความจำเพาะ และความถูกต้องของการทำนายของแบบประเมิน*

ผลการศึกษา: *ผู้ป่วย 24 รายมีอาการปวดทางระบบประสาท 49 รายมีอาการปวดทางระบบกระดูกและกล้ามเนื้อ และ 27 ราย มีอาการปวดผสมผสานทั้ง 2 ระบบ ผู้ป่วย 46 ราย มีอาการปวดเรื้อรัง เป็นผู้ป่วยเพศหญิงทั้งสิ้น 75 ราย ความไวและความจำเพาะของแบบประเมินเท่ากับ 83 และ 80 เปอร์เซ็นตามลำดับ ความถูกต้องของการทำนายประมาณโดยใช้พื้นที่ใต้กราฟของ ROC ของกลุ่มอาการปวดทางระบบประสาท กลุ่มอาการปวดทางระบบกระดูก และกล้ามเนื้อ และกลุ่มอาการปวดผสมผสาน เท่ากับ 0.890 (95% CI 0.824-0.955), 0.587 (95% CI 0.464-0.709) และ 0.147 (95% CI 0.071-0.224) ตามลำดับ*

สรุป: *แบบประเมิน ID Pain Scale ฉบับภาษาไทยเป็นแบบประเมินที่สั้น สะดวกในการประเมิน และมีความถูกต้องของการทำนายเพื่อคัดกรองอาการปวดทางระบบประสาทในเกณฑ์ดี ส่วนความถูกต้องของการทำนายในผู้ป่วยที่มีอาการปวดผสมผสาน และอาการปวดทางระบบกระดูกและกล้ามเนื้อ อยู่ในเกณฑ์ปานกลางและต่ำตามลำดับ*