Survey of Thai Physicians Regarding Recognition and Management of Inflammatory Back Pain and Spondyloarthritis

Mintra Tangrungruengkit MD*,
Varalak Srinonprasert MD**, Praveena Chiowchanwisawakit MD*

** Division of Rheumatology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*
*** Division of Geriatric Medicine, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Objective: *To assess recognition and management of inflammatory back pain (IBP) and spondyloarthritis (SpA) among non-rheumatologists (NRs) and rheumatologists in Thailand.*
Material and Method: *A cross-sectional survey was conducted among physicians in Thailand. A questionnaire designed to evaluate knowledge regarding IBP and SpA was sent to 1,336 NRs. A different questionnaire regarding SpA management in practice was sent to 112 rheumatologists.*
Results: *Of 1,448 questionnaires distributed, 367 (25.3%) questionnaires were returned (NRs: 321 [24.0%] and included rheumatologists, 46 [41.1%]). Among NRs, 26.6%, 20.9%, and 9.4% recognized all features of IBP, according to Calin, Assessment of SpondyloArthritis International Society, and Berlin criteria, respectively. In the presence of typical features of ankylosing spondylitis, 57.8% of NRs made the correct diagnosis. Regarding related clinical skills and involvement, 43.8%, 53.6%, and 37.3% of NRs lacked confidence in distinguishing IBP from mechanical back pain, performing musculoskeletal examination, and interpretation of plain radiography, respectively. Expensive biologic agents (31.2%) and advanced disease stage at diagnosis (27.1%) were the main problems reported by rheumatologists.*
Conclusion: *Problems in diagnosis and management of SpA patients among NRs in Thailand included lack of knowledge and lack of associated clinical skills. Issues reported by rheumatologists centered on case management limitations. In order to improve overall quality of care for SpA patients, focused strategies should be implemented for both NRs and rheumatologists that consider the needs of patients, clinicians, and policy makers.*

Keywords: *Ankylosing spondylitis, Axial spondyloarthritis, Spondyloarthritis, Survey on inflammatory back pain*

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Spondyloarthritis (SpA) is a group of inflammatory rheumatic diseases consisting of ankylosing spondylitis (AS), psoriatic arthritis (PsA), reactive arthritis (ReA), arthritis associated with inflammatory bowel disease (IBD), and undifferentiated arthropathy. The prototype is AS, for which the most common presentation is inflammatory back pain (IBP), with diagnosis requiring evidence of sacroiliitis by radiography according to modified New York criteria[1]. Diagnosis of AS is usually delayed an average of 8 to 11 years from onset of symptoms[2]. Impact on health and quality of life in AS patients is substantial[3], with delayed diagnosis being associated with reduced survival[4]. Moreover, IBP is a common presenting symptom in SpA patients[5]. Therefore, distinguishing IBP from other causes of chronic back pain, which is a common symptom in the general population[6,7], is necessary for making accurate diagnosis in the early course of SpA.

There are three well-known classification criteria for identifying IBP. The Calin criteria[8] (89.9% sensitivity, 52.5% specificity)[9] were proposed in 1977, the Berlin criteria[10] (70.0% sensitivity, 81.4% specificity)[9] were announced in 2006, and the Assessment of SpondyloArthritis International Society (ASAS) criteria[9] (79.6% sensitivity, 72.4% specificity)[9] were established in 2009. Inability to identify IBP may be one of the factors responsible for delaying diagnosis of SpA. One study reported that only 5% of general practitioners (GPs) in the United Kingdom

Correspondence to:
Chiowchanwisawakit P, 8th Floor Asdang Building, Division of Rheumatology, Siriraj Hospital, 2 Wanglang Road, Bangkoknoi, Bangkok 10700, Thailand.
Phone: +66-2-4197775; Fax: +66-2-4183222
E-mail: praveena.chi@mahidol.ac.th

could identify all features of the Berlin criteria for IBP[11].

To establish SpA cases early, ASAS criteria for classification of axial SpA were recently developed using IBP plus positive human leukocyte antigen B27 (HLA-B27) or imaging and other SpA-related features[12]. Therefore, awareness and recognition of other SpA-related features (e.g., dactylitis, uveitis, and psoriasis) are necessary for physicians to effectively and accurately diagnose SpA[13].

In addition to early diagnosis of IBP and SpA, proper non-pharmacologic and pharmacologic treatment is also essential for improving quality of care. Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used to control musculoskeletal pain and stiffness. In cases of uncontrolled inflammation, disease-modifying antirheumatic drugs (DMARDs) like sulfasalazine could play a role. More recently, anti-tumor necrosis factor alpha (TNF-α) agents have also shown some benefit in refractory cases.

In Thailand, SpA is not as well known among clinicians as rheumatoid arthritis. This relative lack of awareness may result in low recognition of SpA-related features and delayed diagnosis of SpA. Knowing the problems and challenges associated with diagnosis and management of SpA may help to improve quality of care in these patients. This study endeavored to assess and evaluate recognition of IBP- and SpA-related features, management, and other related problems in clinical practice among Thai non-rheumatologists (NRs). It further aimed to learn and understand the preferences of Thai rheumatologists regarding method of diagnostic evaluation, non-pharmacologic management, and methods for assessing disease activity in SpA.

Material and Method

A cross-sectional questionnaire survey was conducted among physicians practicing in Thailand. Physicians were divided into two groups, non-rheumatologists (NRs) and rheumatologists. Rheumatology trainees were excluded. E-mail addresses of physicians in Thailand were requested from one university hospital (Siriraj Hospital, SH), four royal colleges (The Royal College of Physicians of Thailand, Royal College of Surgeons of Thailand, Royal College of Orthopaedic Surgeons of Thailand, and The Royal College of Physiatrists of Thailand), and 10 professional societies or associations (Thai Society of Clinical Oncology, Infectious Disease Association of Thailand, The Nephrology Society of Thailand, The Gastroenterological Association of Thailand, The Neurological Society of Thailand, Thoracic Society of Thailand under Royal Patronage, The Thai Society of Hematology, The Heart Association of Thailand under The Royal Patronage of HM The King, Thai Association of Emergency Medicine, and Thai Rheumatism Association). The Royal College of Orthopaedic Surgeons of Thailand, The Royal College of Physiatrists of Thailand, Thai Rheumatism Association, and Siriraj Hospital all provided the requested e-mail addresses. Participation in the survey was voluntary and anonymous. The protocol for this study was reviewed by the Siriraj Institutional Review Board (SIRB) and was rated as exempt from the procedural review and approval process. This study abided by the ethical principles set forth in the 1964 Declaration of Helsinki, to include those of all subsequent amendments.

Questionnaire

The questionnaires distributed to NRs and rheumatologists were different. The non-rheumatologist questionnaire was designed to assess ability to identify symptoms of IBP, SpA features (enthesitis, arthritis, dactylitis, uveitis, psoriasis, good response to NSAIDs, Crohn's disease/ulcerative colitis, family history of SpA, positive HLA-B27, and elevated CRP), SpA disease spectrum, and diagnostic methods used. In addition, a typical case of AS was described and the physicians were asked about diagnosis, management, and tools used for assessing the disease. There were also questions regarding problems and challenges associated with SpA that are encountered in clinical practice. The questionnaire had a multiple-choice format with space provided for comments.

The questionnaire for rheumatologists was designed to explore the diagnostic tools used in clinical practice. Response to these questions was rated according to range of frequency, as follows: 0%, 1 to 50%, and 51 to 100%. Methods of non-pharmacologic management and tools used to evaluate disease activity in clinical practice were explored and evaluated. Answer format consisted of selecting all appropriate items from the list of choices provided. Similar to the design of non-rheumatologist survey, space was provided for rheumatologists to comment, make suggestions, and/or describe challenges in SpA management.

Questionnaires were developed in two formats, paper-based and online computer-based. Both the paper and online versions of each of the two questionnaires contained exactly the same information. To avoid

duplication and misclassification, a plan for distribution was developed and implemented. In the first phase of questionnaire distribution, which was conducted between September 1 and December 1, 2012, paper-based questionnaires for NRs were sent to 330 doctors working at SH. In distribution phase 2, which was conducted between December 2, 2012 and October 31, 2013, 400 paper-based questionnaires for NRs were distributed to doctors not employed at SH or to doctors attending a conference at which SpA was not a lecture topic. Included in phase 2 distribution, online questionnaires were emailed to 606 (0.02% of Thai NRs) NRs and 112 (100%) rheumatologists practicing in Thailand, but at locations or facilities other than SH.

Statistical analysis

NRs were divided into three groups according to their medical specialty, as follows, clinician group 1, internal medicine doctors, clinician group 2, orthopedists and physiatrists, and clinician group 3, physicians in other specialties. IBP diagnoses were based on Calin[8], Berlin[10], and ASAS criteria[9]. AS was diagnosed following modified New York criteria[1].

Demographic characteristics are presented as frequency, percentage, mean, and standard deviation (SD). Comparison of categorical variables was performed by Pearson's Chi-square test or Fisher's exact test, as appropriate. One-way ANOVA was used to compare continuous variables between more than two groups. A p-value <0.05 was considered to be statistically significant. Statistical analyses were performed using SPSS version 16.0 for Windows (SPSS, Inc., Chicago, IL, USA).

Results

Three hundred sixty seven (25.3%) questionnaires were returned, 46 (41.1%) of 112 rheumatologists and 321 (24.0%) of 1336 NRs. Some of the returned questionnaires contained unanswered questions or incomplete responses. One hundred fifty three (47.7%), 70 (21.8%), and 98 (30.5%) NRs were classified as clinician groups 1, 2, and 3, respectively. In clinician group 3, 71 (85.5%) were GPs. Among the NRs, median (minimum (min), maximum (max)) time since medical graduation and frequency of attending scientific meetings were 5.0 (0.0, 35.0) years and 3.0 (1.0, 6.0) times/year, respectively. Within each of the three non-rheumatologist groups, there was significant difference in both median (min, max) time since medical graduation and frequency of attending scientific meetings (p<0.05) (Table 1). Among rheumatologists, median time since finishing rheumatology training and frequency of attending scientific meetings were shown at Table 1.

Recognition of inflammatory back pain by non-rheumatologists

Three hundred twenty NRs responded to this set of questions. Of the combined Calin, ASAS, and

Table 1. Characteristics of non-rheumatologists and rheumatologists

	Non-rheumatologists	Rheumatologists
Participants, n/N (%)	321/1,336 (24.0)	46/112 (41.1)
Workplace		
University hospital, n (%)	187 (58.3)	27 (58.7)
Public hospital, n (%)	94 (29.3)	8 (17.4)
Private hospital, n (%)	35 (10.9)	8 (17.4)
Other, n (%)	5 (1.6)	3 (6.5)
Median (min, max) duration of MD graduation (years)	5.0 (0, 35.0)	8.0 (1.0, 30.0)
Clinician 1[a]	5.0 (1.0, 24.0)*	N/A
Clinician 2[b]	10.0 (2.0, 35.0)	N/A
Clinician 3[c]	3.0 (0, 27.0)	N/A
Mean (SD) frequency of attending scientific meeting (years)	3.0 (1.0, 6.0)	3.0 (0, 5.0)
Clinician 1[a]	3.0 (1.0, 6.0)**	N/A
Clinician 2[b]	3.0 (1.0, 6.0)	N/A
Clinician 3[c]	3.0 (1.0, 6.0)	N/A

n = number in that condition; N = total number; min = minimum; max = maximum; N/A = not applicable; MD = medical degree
[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors
* Comparison of median duration of MD graduation among clinicians computed by Kruskal-Wallis test (p-value <0.0001)
** Comparison of median frequency of attending scientific meeting among clinicians was computed by Kruskal-Wallis test (p-value = 0.019)

Berlin criteria for IBP, the most common feature of IBP recognized among NRs was insidious onset (71.9%), while the least common recognized feature was alternating buttock pain (36.9%). Some non-IBP features were rated by NRs as features of IBP, such as back pain throughout the night, back pain only at the beginning of the night, sudden onset of back pain, and relieved by rest (Table 2). Regarding IBP criteria, 26.6%, 20.9%, and 9.4% of NRs were able to identify all IBP parameters according to Calin, ASAS, and Berlin criteria, respectively, with significant difference among clinician groups ($p<0.05$). Clinician group 1 more correctly identified IBP according to Calin, ASAS, and Berlin criteria than the other two groups (Table 2).

Recognition of spondyloarthritis features and diagnostic methods used among non-rheumatologists

One hundred fifteen (74.3%), 55 (79.7%), and 43 (44.3%) NRs in clinician groups 1, 2, and 3, respectively, had experience in treating patients with SpA ($p<0.0001$). AS (95.0%) was the most common disease known as SpA among NRs. Only a small proportion of NRs incorrectly considered post-streptococcal reactive arthritis and human immunodeficiency virus-associated arthritis as spectrum diseases of SpA (Table 2).

With regard to making a diagnosis for IBP, nearly all NRs were aware that knowledge of SpA-related features was essential. The mean (SD) of recognized SpA features, excluding IBP, was 7.0 (2.3), 6.4 (2.9), and 5.2 (2.6) in clinician groups 1, 2, and 3, respectively. Psoriasis was the most common feature of SpA known among Thai NRs, while back pain response to NSAIDs was the least commonly known feature (Table 3). Recognition of each SpA feature was significantly different among groups (Table 3). The proportion of NRs with knowledge of these features was higher in clinician group 1 than in the other two groups.

Questionnaire responses indicated that a majority of NRs knew that examination of SI joints

Table 2. Recognition of inflammatory back pain features and spectrum of spondyloarthritis among non-rheumatologists in Thailand

	Total n (%)	Clinician 1[a] n (%)	Clinician 2[b] n (%)	Clinician 3[c] n (%)	*p*-value
Features of back pain	320 (100)	153 (100)	69 (100)	98 (100)	
Onset age <40 years	218 (68.1)	110 (71.9)	46 (66.7)	62 (63.3)	0.359*
Duration ≥3 months	186 (58.1)	99 (64.7)	40 (58.0)	47 (48.0)	0.031*
Insidious onset	230 (71.9)	122 (79.7)	50 (72.5)	58 (59.2)	0.002*
Morning stiffness duration >30 minutes	157 (49.1)	80 (52.3)	42 (60.9)	35 (35.7)	0.003*
Not relieved by rest	203 (63.4)	111 (72.5)	43 (62.3)	49 (50.0)	0.001*
Relieved by exercise	204 (63.8)	114 (74.5)	40 (58.0)	50 (51.0)	<0.001*
Pain at second half of night	147 (45.9)	80 (52.3)	29 (42.0)	38 (38.8)	0.087*
Hip/alternating buttock pain	118 (36.9)	73 (47.7)	25 (36.2)	20 (20.4)	<0.001*
Sudden onset	39 (12.2)	12 (7.8)	13 (18.8)	14 (14.3)	0.048*
Relieved by rest	46 (14.4)	16 (10.5)	13 (18.8)	17 (17.3)	0.163*
Pain throughout night	110 (34.4)	53 (34.6)	34 (49.3)	23 (23.5)	0.002*
Calin criteria	85 (26.6)	58 (37.9)	13 (18.8)	14 (14.3)	<0.001*
ASAS criteria	67 (20.9)	42 (27.5)	11 (15.9)	14 (14.3)	0.021*
Berlin criteria	30 (9.4)	17 (11.1)	8 (11.6)	5 (5.1)	0.224*
Any criteria	111 (34.7)	72 (47.1)	20 (29.0)	19 (19.4)	<0.001*
Spectrum of spondyloarthritis	318 (100)	152 (100)	69 (100)	97 (100)	
Ankylosing spondylitis	302 (95.0)	148 (97.4)	66 (95.7)	88 (90.7)	0.079**
Psoriatic arthritis	247 (77.7)	134 (88.2)	53 (76.8)	60 (61.9)	<0.001*
Reactive arthritis	249 (78.3)	137 (90.1)	48 (69.6)	64 (66.0)	<0.001*
Undifferentiated SpA	197 (61.9)	102 (67.1)	44 (63.8)	51 (52.6)	0.065*
IBD-associated arthritis	166 (52.2)	106 (69.7)	29 (42.0)	31 (32.0)	<0.001*
Acute anterior uveitis	82 (25.8)	47 (30.9)	19 (27.5)	16 (16.5)	0.037*
HIV-associated arthritis	42 (13.2)	20 (13.2)	15 (21.7)	7 (7.2)	0.024*
Post-streptococcal reactive arthritis	73 (23.0)	45 (29.6)	17 (24.6)	11 (11.3)	0.003*

NSAIDs = non-steroidal anti-inflammatory drugs; ASAS = Assessment of SpondyloArthritis International Society; SpA = spondyloarthritis; IBD = inflammatory bowel disease; HIV = human immunodeficiency virus

[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors

* Chi-square test, ** Fisher's exact test

was essential for making diagnosis. However, chest expansion appeared to be the least known examination among NRs (Table 3). Regarding additional investigations for making the diagnosis of IBP, 96.3% of NRs suggested at least one diagnostic test. Among them, 84.7% suggested lumbosacral spinal radiography, while only 57.1%, and 45.1% suggested pelvic radiography, and HLA-B27 testing, respectively (Table 3).

Diagnosis and management of ankylosing spondylitis among non-rheumatologists

Based on the questionnaire-provided case of a 30-year-old man with IBP for four months, having morning stiffness of the back for one hour, midnight pain two or three times per week, and bilateral grade 2 radiographic sacroiliitis, 57.8% of 306 participants correctly diagnosed AS. The rate of accurate diagnosis was significantly different among NRs clinicians (clinician group 1, 63.9%; clinician group 2, 58.7%; and clinician group 3, 47.9%; $p = 0.04$).

Regarding non-pharmacologic management of this case, Most NRs advised their patient to maintain good posture during daily activities, perform back exercises, and frequently perform spinal ROM. Only 97 (31.5%) NRs provided advice about using an appropriate mattress, while 19.2% and 6.2% NRs suggested the use of a lumbar brace and chiropractic therapy, respectively. For pharmacologic management, oral NSAIDs were most commonly used, while oral corticosteroid was least commonly used (Table 4). Interestingly, 21.4% of clinicians selected anti-TNF-α agents and 14.9% selected DMARDs, with significant differences among clinician groups (Table 4).

Table 3. History-taking of spondyloarthritis features, physical examination, and diagnostic methods used for making diagnosis in patients with inflammatory back pain among non-rheumatologists in Thailand

	Total n (%)	Clinician 1[a] n (%)	Clinician 2[b] n (%)	Clinician 3[c] n (%)	*p*-value
Taking of patient history	315 (100)	151 (100)	68 (100)	96 (100)	
Peripheral arthritis	227 (72.1)	115 (76.2)	48 (70.6)	64 (66.7)	0.252*
Dactylitis	162 (51.4)	108 (71.5)	26 (38.2)	28 (29.2)	<0.001*
Heel enthesitis	220 (69.8)	120 (79.5)	51 (75.0)	49 (51.0)	<0.001*
Buttock pain	150 (47.6)	85 (56.3)	33 (48.5)	32 (33.3)	0.002*
Psoriasis	241 (76.5)	127 (84.1)	51 (75.0)	63 (65.6)	0.003*
Inflammatory bowel disease	200 (63.5)	115 (76.2)	36 (52.9)	49 (51.0)	<0.001*
Uveitis	238 (75.6)	132 (87.4)	46 (67.6)	60 (62.5)	<0.001*
Family history of SpA	227 (72.1)	115 (76.2)	50 (73.5)	62 (64.6)	0.133*
History of GI/GU infection	221 (70.2)	122 (80.8)	45 (66.2)	54 (56.2)	<0.001*
Response to NSAIDs	145 (46.0)	68 (45.0)	33 (48.5)	44 (45.8)	0.903*
Physical examination	311 (100)	151 (100)	64 (100)	96 (100)	
FABER test/SIJ compression	281 (90.4)	143 (94.7)	59 (92.2)	79 (82.3)	0.005*
Posture	237 (76.2)	123 (81.5)	50 (78.1)	64 (66.7)	0.027*
Range of motion of spine	271 (87.1)	143 (94.7)	55 (85.9)	73 (76.0)	<0.001*
Chest expansion	185 (59.5)	113 (74.8)	37 (57.8)	35 (36.5)	<0.001*
Skin and nail	238 (76.5)	129 (85.4)	49 (76.6)	60 (62.5)	<0.001*
Peripheral joint	217 (69.8)	123 (81.5)	42 (65.6)	52 (54.2)	<0.001*
Enthesitis	246 (79.1)	137 (90.7)	51 (79.7)	58 (60.4)	<0.001*
Investigation for diagnosis	308 (100)	149 (100)	63 (100)	96 (100)	
Erythrocyte sedimentation rate	245 (79.5)	122 (81.9)	53 (84.1)	70 (72.9)	0.142*
C-reactive protein	175 (56.8)	83 (55.7)	44 (69.8)	48 (50.0)	0.045*
Rheumatoid factor	110 (35.7)	37 (24.8)	40 (63.5)	33 (34.4)	<0.001*
HLA-B27	139 (45.1)	74 (49.7)	35 (55.6)	30 (31.2)	0.003*
Radiography of pelvis/KUB	176 (57.1)	105 (70.5)	38 (60.3)	33 (34.4)	<0.001*
Radiography of lumbosacral spine	261 (84.7)	123 (82.6)	57 (90.5)	81 (84.4)	0.338*
MRI of pelvis	19 (6.2)	12 (8.1)	3 (4.8)	4 (4.2)	0.475**
MRI of spine	27 (8.8)	11 (7.4)	3 (4.8)	13 (13.5)	0.105*

SpA = spondyloarthritis; NSAIDs = non-steroidal anti-inflammatory drugs; FABER = flexion, abduction, external rotation, and extension; SIJ = sacroiliac joint; GI/GU = gastrointestinal/genitourinary system; KUB = kidneys, ureters, and bladder; MRI = magnetic resonance imaging; HLA-B27 = human leukocyte antigen B27

[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors

* Chi-square test, ** Fisher's exact test

Diagnostic evaluation and management of patients with spondyloarthritis among rheumatologists

Regarding diagnostic investigation for AS, the percentage of rheumatologists who reported a >50% frequency in performing the following tests in clinical practice was, as follows, erythrocyte sedimentation rate/C-reactive protein (ESR/CRP), 97.8%; lumbosacral-spine radiography, 87.0%; KUB or pelvic radiography, 78.3%; thoracic-spine radiography, 39.1%; both cervical-spine radiography and HLA-B27, 32.6%; and sacroiliac joint (SIJ) or spinal magnetic resonance imaging (MRI), 0%. Based on the questionnaire-provided case of a patient with IBP for four months, with history of uveitis, and without remarkable history or radiographic finding, 63.0%, 58.7%, and 22.2% of rheumatologists suggested performing HLA-B27 testing, SIJ MRI, and spinal MRI, respectively.

Regarding patient education, rheumatologists were significantly more likely to advise AS patients to use a firm mattress, perform spinal range of motion (ROM) and back exercises, and stop smoking, and less likely to advise patients to use lumbar support, as compared to NRs (p<0.05) (Table 4).

Tools for monitoring disease activity used by non-rheumatologists and rheumatologists

Regarding tools used for monitoring disease activity, duration of morning stiffness, global back pain, nocturnal back pain, patient global assessment (PGA), and ESR/CRP were used significantly more by rheumatologists than by NRs (p<0.05). Bath AS Disease Activity Index (BASDAI) and Physician Global Assessment (PhyGA) were also commonly used among rheumatologists, while mobility measurement was less commonly used. Bath AS Functional Index (BASFI) (9.1%) and Euro Quality of Life (EuroQol-5D) (2.3%), both of which assess patient function and quality of life, were rarely used (Table 5).

Problems in clinical practice among non-rheumatologists and rheumatologists

In clinical practice, 79.5%, 71.3%, 63.5%, 62.5%, and 59.9% of NRs reported having performed ROM of the cervical-spine, chest expansion, fingertip-to-floor test, lateral spinal flexion, and the Schöber test. Approximately half of NRs reported having problems, including lack of confidence in distinguishing

Table 4. Management of spondyloarthritis among non-rheumatologists and rheumatologists in Thailand

	Non-rheumatologists					Rheumatologists n = 46 n (%)	p-value[e]
	Total n = 308 n (%)	Clinician 1[a] n = 149 n (%)	Clinician 2[b] n = 63 n (%)	Clinician 3[c] n = 96 n (%)	p-value[d]		
Patient education							
Maintaining a good posture	272 (88.3)	135 (90.6)	54 (85.7)	83 (86.5)	0.495*	41 (89.1)	1.000*
Using a firm mattress	97 (31.5)	54 (36.2)	27 (42.9)	16 (16.7)	0.001*	33 (71.7)	<0.001*
Doing spinal ROM[f]	201 (65.3)	103 (69.1)	44 (69.8)	54 (56.2)	0.082*	38 (82.6)	0.027*
Back exercise	214 (69.5)	110 (73.8)	46 (73.0)	58 (60.4)	0.069*	44 (95.7)	<0.001*
Smoking cessation	163 (52.9)	90 (60.4)	37 (58.7)	36 (37.5)	0.001*	43 (93.5)	<0.001*
Using lumbar brace	59 (19.2)	28 (18.8)	12 (19.0)	19 (19.8)	0.981*	1 (2.2)	0.005*
Using warm physiotherapy	116 (37.7)	47 (31.5)	30 (47.6)	39 (40.6)	0.070*	16 (34.8)	0.747*
Chiropractic therapy	19 (6.2)	11 (7.4)	4 (6.3)	4 (4.2)	0.592**	0	0.150**
Massage	35 (11.4)	12 (8.1)	11 (17.5)	12 (12.5)	0.126*	6 (13.0)	0.804*
Pharmacologic management							
Analgesic cream	77 (25.0)	24 (16.1)	21 (33.3)	32 (33.3)	0.002*	N/A	N/A
Oral NSAIDs	281 (91.2)	139 (93.3)	54 (85.7)	88 (91.7)	0.200*	N/A	N/A
DMARDs	46 (14.9)	33 (22.1)	9 (14.3)	4 (4.2)	0.001*	N/A	N/A
Oral steroid	17 (5.5)	4 (2.7)	7 (11.1)	6 (6.2)	0.049**	N/A	N/A
Acetaminophen	132 (42.9)	60 (40.3)	33 (52.4)	39 (40.6)	0.241*	N/A	N/A
Muscle relaxant	84 (27.3)	27 (18.1)	22 (34.9)	35 (36.5)	0.002*	N/A	N/A
Opioid group	25 (8.1)	12 (8.1)	6 (9.5)	7 (7.3)	0.926*	N/A	N/A
Anti-TNF-α agents	66 (21.4)	42 (28.2)	6 (9.5)	18 (18.8)	0.007*	N/A	N/A

NSAIDs = non-steroidal anti-inflammatory drugs; DMARDs = disease-modifying antirheumatic drugs; TNF = tumor necrosis factor; N/A = not applicable

[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors, [d] Difference among clinician groups, [e] Difference between rheumatologists and non-rheumatologists, [f] Frequently doing spinal range of motion exercise

* Chi-square test, ** Fisher's exact test

mechanical back pain from IBP and lack of confidence in performing and interpreting musculoskeletal examinations. Other issues related to diagnosis were lack of knowledge of SpA and IBP, lack of confidence in interpretation of SIJ and spinal radiography, and unavailable testing (e.g., HLA-B27) (Table 6). The most common problem related to treatment was lack of confidence in using DMARDs. Problems associated with SpA in clinical practice as reported by rheumatologists included high cost of biologic

Table 5. Tools used for monitoring disease activity by non-rheumatologists and rheumatologists in Thailand

	Non-rheumatologists					Rheumatologists n = 44 n (%)	*p*-value[e]
	Total n = 308 n (%)	Clinician 1[a] n = 149 n (%)	Clinician 2[b] n = 63 n (%)	Clinician 3[c] n = 96 n (%)	*p*-value[d]		
AM stiffness	181 (58.8)	98 (65.8)	36 (57.1)	47 (49.0)	0.032*	44 (100)	<0.001*
Nocturnal BP	131 (42.5)	70 (47.0)	24 (38.1)	37 (38.5)	0.313*	36 (81.8)	<0.001*
Global BP	180 (58.4)	93 (62.4)	42 (66.7)	45 (46.9)	0.018*	44 (100)	<0.001*
PGA	189 (61.4)	96 (64.4)	42 (66.7)	51 (53.1)	0.139*	34 (79.1)	0.027*
ESR/CRP	197 (64.0)	111 (74.5)	29 (46.0)	57 (59.4)	<0.001*	43 (97.7)	<0.001*
BASDAI	N/A	N/A	N/A	N/A	N/A	29 (65.9)	N/A
BASMI	N/A	N/A	N/A	N/A	N/A	10 (22.7)	N/A
ASDAS	N/A	N/A	N/A	N/A	N/A	5 (11.4)	N/A
PhyGA	N/A	N/A	N/A	N/A	N/A	30 (69.3)	N/A
BASFI	N/A	N/A	N/A	N/A	N/A	7 (15.9)	N/A

AM stiffness = duration of morning stiffness; BP = back pain; PGA = patient global assessment; ESR/CRP = erythrocyte sedimentation rate/C-reactive protein; AS = ankylosing spondylitis; BASDAI = Bath AS Disease Activity Index; BASMI = Bath AS Metrology Index; ASDAS = AS Disease Activity Score; PhyGA = physician global assessment; BASFI = Bath AS Functional Index; N/A = not applicable

[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors, [d] Difference among clinician groups, [e] Difference between rheumatologists and non-rheumatologists

* Chi-square test, ** Fisher's exact test

Table 6. Problems in diagnosis and management of spondyloarthritis among non-rheumatologists in Thailand

	Total n = 308 n (%)	Clinician 1[a] n = 149 n (%)	Clinician 2[b] n = 63 n (%)	Clinician 3[c] n = 96 n (%)	*p*-value
Lack of knowledge of spondyloarthritis	67 (21.8)	20 (13.4)	11 (17.5)	36 (37.5)	<0.001*
Lack of knowledge of IBP	51 (16.6)	14 (9.4)	8 (12.7)	29 (30.2)	<0.001*
Lack of confidence to distinguish between mechanical and inflammatory back pain	135 (43.8)	57 (38.3)	16 (25.4)	62 (64.6)	<0.001*
Lack of confidence in performing musculoskeletal examination	165 (53.6)	89 (59.7)	16 (25.4)	60 (62.5)	<0.001*
Lack of confidence in interpretation of physical examination	144 (46.8)	72 (48.3)	15 (23.8)	57 (59.4)	<0.001*
Unavailable diagnostic testing (e.g., HLA-B27)	121 (39.3)	54 (36.2)	16 (25.4)	51 (53.1)	0.001*
Lack of confidence in interpreting radiography	115 (37.3)	60 (40.3)	14 (22.2)	41 (42.7)	0.019*
Sacroiliac joint	80 (26.0)	43 (28.9)	6 (9.5)	31 (32.3)	0.003*
Spine	59 (19.2)	30 (20.1)	4 (6.3)	25 (26.0)	0.008*
Lack of confidence in using NSAIDs	52 (16.9)	29 (19.5)	9 (14.3)	14 (14.6)	0.504*
Lack of confidence in using DMARDs	204 (66.2)	117 (78.5)	34 (54.0)	53 (55.2)	<0.001*
Lack of knowledge in selecting tool to monitor spondyloarthritis	110 (35.7)	52 (34.9)	18 (28.6)	40 (41.7)	0.232*

IBP = inflammatory back pain; NSAIDs = non-steroidal anti-inflammatory drugs; DMARDs = disease-modifying antirheumatic drugs

[a] Internal medicine doctors, [b] Orthopedists and physiatrists, [c] Other specialty doctors

* Chi-square test, ** Fisher's exact test

treatment, 31.2%; advanced disease stage at diagnosis, 27.1%; unavailable diagnostic testing (e.g., HLA-B27 and MRI), 16.7%; and complicated monitoring tools, 12.5%.

Discussion

This study demonstrated low recognition of IBP criteria among Thai NRs, as illustrated by 34.7% of NRs knowing at least one of the ASAS[9], Calin[8], or Berlin[10] IBP criteria. Spinal and sacroiliac joint inflammation in axial SpA and AS usually has no obvious observable or palpable inflammation, similar to peripheral arthritis. Therefore, knowledge of IBP presentation features is essential for identifying IBP. Thai NRs (less than one-third) identified IBP most successfully using Calin criteria[8]. However, identification of IBP by the other two criteria was lower, with Berlin criteria[10], the lowest at less than 10%. Calin[8] and ASAS[9] criteria for identification of IBP may be better known than the Berlin criteria[10]. Calin criteria[8] were the first criteria for identifying IBP, with ASAS[9] criteria being the most recently introduced. It is, therefore, possible that these criteria may be taught more frequently than Berlin criteria[10] among Thai NRs. The level of knowledge regarding IBP found in our study was comparable to previously reported findings. According to a study by Jois et al[11], only 5% of GPs in Norfolk, UK recognized all features of IBP according to Berlin criteria[10]. In the current study, 9.4% of NRs and 5% of clinician group 3 (the group comprised mainly of GPs) were able to identify IBP using the same criteria used in the Jois et al study[11]. This corresponded with the finding that a majority of NRs reported a lack of confidence in distinguishing mechanical back pain from IBP.

Identifying IBP from chronic back pain increases the probability of axial SpA from 5 to 16%[13]. Identification of other SpA features is needed to achieve a high probability for diagnosis of axial SpA[13]. In the present study, only one-fourth of NRs self-reported a lack of knowledge in SpA. This claim, however, is contradicted by NRs relatively low level of ability to recognize SpA features, as observed from their responses (Table 3). It should be noted that some important features of SpA, such as back pain with good response to NSAIDs, alternate buttock pain, and positive HLA-B27 were not commonly identified by NRs. This information may benefit concerned parties intent on or responsible for improving knowledge among physicians regarding early detection of SpA in the community.

More than 50% of Thai NRs have performed spinal mobility in their practice. However, a substantial proportion of NRs still lack confidence in musculoskeletal examination and interpretation, especially those in clinician groups 1 and 3. Furthermore, 37.3% of NRs described lack of confidence in interpreting related radiography. These factors may contribute, to some extent, to delayed diagnosis of axial SpA in clinical practice, most notably the diagnosis of AS. Arranging workshops to enhance these skills may be a way to improve both clinician confidence and earlier and more accurate recognition of SpA.

To diagnose patients presenting with IBP in the early course of the disease, ASAS recently issued axial SpA classification criteria[12]. A positive HLA-B27 test or evidence of sacroiliitis by radiography or MRI may play a role in accelerating diagnosis. Utilization of these tests appeared to be limited in the present study. HLA-B27 testing is available only in a few hospitals in Thailand, so it may not be feasible for practitioners to use this criterion for making diagnosis. SIJ and spine MRI were seldom used for diagnostic investigation because of high cost, limited availability, and long waiting list in Thailand. This scarcity of sophisticated diagnostic options is common in resource-limited countries like Thailand.

Both non-pharmacologic and pharmacologic treatments are essential for managing patients with SpA. Most of the Thai rheumatologists and NRs in this study advised patients regarding the importance of maintaining good posture. However, NRs were less likely than rheumatologists to advise patients on other forms of non-pharmacologic treatment, such as the use of a firm mattress, frequent spinal ROM and back exercises, and smoking cessation. Interestingly, although lumbar brace should not be used in these patients, it was occasionally advised by both NRs (19.2%) and rheumatologists (2.1%). Among NRs, those in clinician group 1 were more likely to advise using a firm mattress and smoking cessation. The difference in proportion of physicians providing patient education may be due to differences in experience in taking care of SpA patients and knowledge of the disease. Regarding pharmacological management, the use of DMARDs remains an issue requiring further attention, given that 66.2% of NRs reported a lack of confidence in using them.

Assessment of disease status and response to treatment in AS is crucial to achieving better quality patient management. ASAS recommended a core set

of clinical factors to be recorded and evaluated, including PGA, spinal pain, spinal stiffness, spinal mobility, physical function, peripheral joints and entheses, ESR, and fatigue[14]. In this study, 35.7% of NRs also described a lack of knowledge in selecting tools for estimating disease status and response to treatment. Rheumatologists reported collecting data on PGA, nocturnal back pain, ESR/CRP, global back pain, and duration of morning stiffness at rates varying from 79.1 to 100%. However, only 22.7% and 15.9% of rheumatologists used Bath AS Metrology Index (BASMI) and BASFI for monitoring the disease, respectively. This low guideline compliance may relate to the difficulty of the recommendation[14]. Only 12.5% of rheumatologists admitted problems associated with complicated monitoring tools. The BASDAI[15] and PhyGA are currently used to assess disease activity and treatment response worldwide (including Thailand), especially among patients using biologic agents. BASDAI and PhyGA were frequently used by Thai rheumatologists. However, the AS Disease Activity Score (ASDAS) was used relatively infrequently despite recent encouragement by ASAS to use this composite score to better correlation patient and physician case perspective[16]. The ASDAS formula uses data from BASDAI, PGA, and ESR or CRP. Thai rheumatologists have rarely used it, although they frequently collect all of the required data[16]. Strategies to improve compliance with standard guidelines should be explored, developed, and implemented.

There are currently about 120 rheumatologists in Thailand, a country whose population is estimated to be as high as 66 million people. As such, it is logical to conclude that most patients suffering from rheumatic diseases, including SpA, in Thailand will not be treated by a rheumatologist at present or even in the near future. To improve the quality of care of SpA patients, problems, and challenges associated with diagnosis and care of these patients need to be identified and addressed. This is the first study in Thailand to investigate challenges involving diagnosis and care in axial SpA among Thai NRs and challenges in clinical practice among Thai rheumatologists. The main limitation of this study was its survey research design. Surveys may not guarantee accuracy of participant responses. Choosing answers from multiple options may result in overestimation of a respondent's knowledge. Moreover, the data and findings may not be representative of all physicians in Thailand. Participants from the university hospital (SH) may be over-represented in this study.

The main problems in diagnosis and management of SpA were lack of knowledge of IBP and SpA and lack of confidence in physical examination and radiographic interpretation. Education may decrease these problems and improve early detection of SpA. A notable issue among rheumatologists is the low rate of adherence to international guidelines, particularly with respect to suggested disease monitoring. It is possible that low guideline adherence may stem from limited clinical and diagnostic resources for practicing clinicians. Education for rheumatologists regarding the advantages of utilizing monitoring tools in their clinical practice, including BASDAI, PGA, CRP/ESR, and ASDAS should be arranged. Tools should be emphasized that strongly correlate with patient symptoms and that take five minutes or less to complete.

Conclusion

Problems in diagnosis and management of SpA patients among NRs in Thailand included lack of knowledge and clinical skills. Issues described by rheumatologists centered mainly on case management limitations. In order to improve overall quality of care for SpA patients, focused strategies should be implemented for both NRs and rheumatologists that consider the needs of patients, clinicians, and policy makers.

What is already known on this topic?

One study from UK showed low recognition of inflammatory back pain according Berlin criteria, ankylosing spondylitis, and associated features of SpA in primary care.

What this study adds?

This is the first study in Thailand regarding recognition of IBP, ankylosing spondylitis, and associated features of SpA by NRs. It demonstrated Calin criteria for IBP was the most common recognized by NRs, followed by Assessment of SpondyloArthritis International Society, and Berlin criteria; however, it was low rate of recognition. Moreover, this study identified problems related diagnosis, management, and monitoring disease in clinical practice.

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Ethical approval

This study was rated as exempt from procedural review and approval by the Siriraj Institutional Review Board (SIRB).

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Potential conflicts of interest

None.

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การสำรวจการวินิจฉัยและการรักษาอาการปวดหลังแบบอักเสบและโรคข้อและข้อกระดูกหลังอักเสบของแพทย์ไทย

มินตรา ตั้งรุ่งเรืองกิจ, วราลักษณ์ ศรีนนท์ประเสริฐ, ปวีณา เชี่ยวชาญวิศวกิจ

วัตถุประสงค์: *เพื่อประเมินการวินิจฉัยและการรักษาอาการปวดหลังแบบอักเสบ และโรคข้อและข้อกระดูกหลังอักเสบของแพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อและอายุรแพทย์โรคข้อในประเทศไทย*

วัสดุและวิธีการ: *การสำรวจแบบตัดขวางในแพทย์ไทย แบบสอบถามได้รับการออกแบบมาเพื่อประเมินความรู้เกี่ยวกับอาการปวดหลังแบบอักเสบและโรคข้อและข้อกระดูกหลังอักเสบถูกส่งให้แพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อ 1,336 คน คำถามเกี่ยวกับการรักษาโรคข้อและข้อกระดูกหลังอักเสบในเวชปฏิบัติถูกส่งให้อายุรแพทย์โรคข้อ 112 คน*

ผลการศึกษา: *แบบสอบถามถูกส่งกลับมาทั้งหมด 367 ฉบับ (ร้อยละ 25.3) จากแพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อ 321 ฉบับ (ร้อยละ 24.0) และอายุรแพทย์โรคข้อ 46 ฉบับ (ร้อยละ 41.1) แพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อรู้เกณฑ์การวินิจฉัยอาการปวดหลังแบบอักเสบครบทุกข้อตามเกณฑ์ Calin, the Assessment of SpondyloArthritis International Society และ Berlin ร้อยละ 26.6, 20.9 และ 9.7 ตามลำดับ เมื่อยกตัวอย่างผู้ป่วยที่มีอาการตรงแบบของโรคข้อและกระดูกสันหลังอักเสบชนิดติดยึด แพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อให้การวินิจฉัยได้ถูกต้องร้อยละ 57.8 แพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อรายงานปัญหาในเวชปฏิบัติที่พบคือ ขาดความมั่นใจในการแยกอาการปวดหลังแบบอักเสบออกจากการปวดหลังจากการใช้งาน การตรวจร่างกายระบบกล้ามเนื้อและข้อและการแปลผลทางภาพถ่ายทางรังสีร้อยละ 43.8, 53.6 และ 37.3 ตามลำดับ สำหรับแพทย์อายุรศาสตร์โรคข้อรายงานว่ายาชีววัตถุมีราคาแพงร้อยละ 31.2 และผู้ป่วยได้รับการวินิจฉัยโรคครั้งแรกเมื่อมีอาการของโรครุนแรงแล้วร้อยละ 27.1*

สรุป: *ในประเทศไทยการวินิจฉัยโรคและการรักษาโรคข้อและข้อกระดูกหลังอักเสบยังคงเป็นปัญหาในเวชปฏิบัติสำหรับแพทย์ที่ไม่ใช่อายุรแพทย์โรคข้อ เนื่องจากขาดความรู้และความชำนาญ สำหรับอายุรแพทย์โรคข้อรายงานว่ามีข้อจำกัดในการรักษา ในการพัฒนาการดูแลรักษาผู้ป่วยโรคข้อและข้อกระดูกหลังอักเสบควรใช้ยุทธวิธีที่แตกต่างกันสำหรับแพทย์ที่มีความชำนาญต่างกัน*