respectively. The best trade-off BASDAI values corresponding to ASDAS -CRP 1.3, 2.1 and 3.5 were 2.1, 3.1 and 3.7 respectively. The optimal BASDAI values corresponding to ASDAS-ESR 1.3, 2.1 and 3.5 were 2.0, 2.6 and 4.8 respectively.

Conclusion: The estimated optimal BASDAI value that corresponds to the recommended ASDAS cut-off ≥ 2.1 for biological therapy initiation was lower than the recommended BASDAI cut-off of ≥ 4 in this Taiwanese AS cohort.

Abstract AB0716 Table 1. Optimal BASDAI cut-off values corresponding to ASDAS cut-offs using ROC curve with Youden's J statistic in AS patients.

	BASDAI cut-off	AUC (95% CI)	Sensitivity (95% CI)	Specificity (95% CI)
ASDAS-CRP 1.3	2.1	0.76 (0.72–0.80)	0.70 (0.65–0.75)	0.82 (0.75–0.88)
ASDAS-CRP 2.1	3.1	0.78 (0.74–0.82)	0.69 (0.62–0.76)	0.87 (0.83–0.91)
ASDAS-CRP 3.5	3.7	0.82 (0.75–0.89)	0.84 (0.66–0.95)	0.81 (0.77–0.84)
ASDAS-ESR 1.3	2.0	0.80 (0.77–0.84)	0.74 (0.69–0.78)	0.87 (0.80–0.92)
ASDAS-ESR 2.1	2.6	0.79 (0.76–0.83)	0.81 (0.74–0.86)	0.78 (0.73–0.82)
ASDAS-ESR 3.5	4.8	0.79 (0.70–0.89)	0.67 (0.46–0.83)	0.92 (0.89–0.94)

REFERENCES

- [1] Machado P, et al. 2011. Ankylosing Spondylitis Disease Activity Score (ASDAS): defining cut-off values for disease activity states and improvement scores. *Ann Rheum Dis* 2011;70:47-53.

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AB0717

RELIABILITY OF SACROILIAC JOINT RADIOGRAPHS IN THE EARLY SPONDYLOARTHRITIS ESPERANZA COHORT

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Background: X-Ray sacroiliitis is the cornerstone in the diagnosis of the ankylosing spondylitis (AS). It is clear that the presence of sacroiliitis is a specific lesion in long standing AS, but little evidence exists on the reliability of this image technique in early axial spondyloarthritis (axSpA), which associates with reduced structural damage. This is relevant because some rheumatologists and pharmacological authorities feel more confident with the diagnosis of AS rather than with non radiographic axial spondyloarthritis (nr-axSpA) forms. On the other hand, according to various research studies, clinicians are subject to potential bias when interpreting radiographs, influenced by their pretest clinical judgment

Objectives: The main objective of this study is to determine the reliability of X-Ray sacroiliitis in the early diagnosis of axSpA.

Methods: This study included 290 radiographs of the SI joints from patients of the Esperanza early spondyloarthritis cohort. Nine readers,

blinded for the diagnosis, participated in the reliability exercise, all of them experienced rheumatologists and members of the Spanish spondyloarthritis working group (GRESER). Patients with axSpA were classified as having AS if the radiographic criteria of the modified NY criteria (presence of radiographic changes in the SIJ of at least grade II bilaterally or at least grade III unilaterally) were fulfilled. The gold standard was the categorical opinion of at least five of the expert readers. For the statistical analysis, the Chi-square and Kappa tests were performed.

Results: The table shows mean kappa values and the agreement reached by each reader. The mean kappa achieved was fair (0.375, range 0.146 - 0.652) and the mean agreement was 73.7% (range: 58.7% - 90%). When the categorical opinion of X-Ray sacroiliitis of at least 5 readers as gold standard was applied, 61 patients were classified as AS and 229, as nr-axSpA. Nevertheless, this scenario varied from 31 to 138 among the readers when the x-ray evaluation was performed by only one reader.

Conclusion: Reliability of X-Ray SIJ in an early SpA cohort was weak among nine experimented readers and the diagnosis of AS was subject to a high variability. At least in doubtful cases, a central evaluation performed by highly qualified readers is advisable.

	Gold standard	Reader 1	Reader 2	Reader 3	Reader 4	Reader 5	Reader 6	Reader 7	Reader 8	Reader 9
Kappa	0.716	0.345	0.468	0.606	0.599	0.459	0.612	0.513	0.809	
Agreement	90.97	68.06	85.52	84.48	85.12	73.79	87.59	78.47	94.14	
SIJ mNY+	61	54	138	31	92	80	137	55	115	48
SIJ mNY TP	61	44	53	25	54	49	61	40	57	46
SIJ mNY FP	229	10	85	6	38	31	76	15	58	2
Sensitivity	73.33%	88.33	59.02	88.52	80.33	100	85.57	93.44	75.41	
Specificity	95.61%	62.72	97.38	83.41	86.40	66.81	93.45	74.45	91.13	
LR +	16.70	2.969	22.53	5.336	5.907	3.013	10.01	3.657	8.502	

SIJ = (SI) joint; mNY+ = number of patients that meet diagnosis of ankylosing spondylitis; TP = true positives; FP = false positives; LR+ = Likelihood ratio +

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AB0718

IDENTIFYING AXIAL SPONDYLOARTHRITIS IN THE UNITED STATES: A POSSIBLE ROLE FOR CHIROPRACTORS

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Background: Approximately 19% of the general population in the United States has chronic back pain (CBP), with 5%-6% of these cases classified as inflammatory back pain (IBP).¹ According to the US National Health and Nutritional Examination Survey, = 15% of patients with IBP have axial spondyloarthritis (axSpA).^{1,2} which can cause irreversible structural damage in the spine, loss of function, and a decreased quality of life. The diagnosis of axSpA is commonly missed, as patients seek care for back pain (BP) from a variety of non-rheumatology providers, including chiropractors.³ Overall, nearly 50% of patients seek chiropractic care for BP.⁴ However, not much is known about the prevalence of different types of BP (acute, chronic, IBP, and BP due to axSpA) in patients seeking chiropractic care in the United States.

Objectives: To investigate the types of providers sought by patients with BP and the prevalence of acute BP, CBP, IBP, and axSpA in patients with BP seeking chiropractic care in the United States. A secondary objective was to investigate how frequently chiropractors refer patients with BP to a rheumatologist.

Methods: PubMed literature searches were performed for all English language articles published through December 2017 to determine which providers are sought by patients with BP as well as the percentage of patients with BP being referred to a rheumatologist following chiropractic consultation. Search terms included "chiropractic," "chiropractor," "axial spondyloarthritis," "ankylosing spondylitis," "inflammatory back pain," "chronic back pain," "acute back pain," "low back pain," "sacroiliac joint," "sacroiliac pain," "back pain epidemiology," "rheumatologist," and "rheumatology." The full text of relevant articles was evaluated for specific data and BP statistics in this care setting.

Results: Only 7 articles that described the types of providers sought by patients with BP were identified (Table 1). Among patients with BP, 7%-45% sought chiropractic care; 26%-70% sought care from general practitioners, and 3%-37% sought care from rheumatologists. Patients who sought chiropractic care were mainly white, female, aged < 65 years old, and of higher socioeconomic and education status. Patients with CBP seeking rheumatologic care had a mean duration of CBP of 14-28 years and were mostly women (56%; age range, 41-50 years)⁵; of these, 1% were referred to a rheumatologist by chiropractors for symptoms suggestive of SpA.⁵ Data regarding the prevalence of different types of BP (eg, acute, CBP, IBP) in US chiropractic practices were not available. No articles describing axSpA in patients in chiropractic care were identified.

Table 1. Diagnosis and Management of Back Pain in the United States: Practitioner Specialties

Study Description	Chiropractor	General Practitioner	Orthopedist	Rheumatologist	Other Specialist	Physical/Massage Therapist	AC/CAM	Other
Gallup-Palmer College of Chiropractic 2016 Annual Report - Survey of adult preferences (n = 7586) for back pain care if costs were equal Reference: https://www.palmer.edu/uploadedfiles/s%20Pages/Annual%20Report%20Palmer%20College%202016.pdf Gallup 2016 - Analysis of Alternative Health Supplement NHTS data for 9065 adults with LBP	28	53*	NR	NR	NR	13	1	4
Reference: Ghidoui N, et al. <i>Glob Adv Health Med</i> . 2016;5:69-78. Wilson 2015 - Analysis of data from the 2002-2012 MEPS for patients with back/joint pain diagnosis (n = 16,762)	15	NR	NR	NR	NR	12	41	NR
Reference: Wilson PA, et al. <i>J Eval Clin Pract</i> . 2015;21:852-857. Deodhar 2016 - Analysis of US commercial claims database of AS in 3336 patients with back pain diagnosed by a non-rheumatologist	24	43	13	3	11	5	1	NR
Reference: Deodhar A, et al. <i>Clin Rheumatol</i> . 2016;35:1769-1776. ⁵ Sherman 2004 - Survey of 249 adults with CBP about their interest in CAM	7 ^c	26	4	37	NR	NR	NR	26
Reference: Sherman KJ, et al. <i>BMC Complement Altern Med</i> . 2004;4:9. Carey 2010 - Telephone survey of 3276 adults in North Carolina with chronic back or neck pain, stratified by race (range)	45	NR	NR	NR	NR	24	11	7
Reference: Carey TS, et al. <i>J Pain</i> . 2010;11:343-350. Carey 1995 - Telephone survey of 4437 adults in North Carolina, CBP prevalence and care-seeking	22-34	50-70	24-42*	NR	NR	10-31*	2-7 ^f	NR
Reference: Carey TS, et al. <i>Spine (Phila Pa 1976)</i> . 1995;20:312-317. AC, acupuncture; AS, ankylosing spondylitis; CAM, complementary and alternative medicine; CBP, chronic back pain; LBP, low back pain; MEPS, Medical Expenditure Panel Survey, NHIS, National Health Interview Survey, NR, not reported.	25	64	55	NR	NR	29	NR	NR

* Reported as medical doctor or primary care doctor in original study. ^b Data reported in this article are for a diagnosis of AS made by a given specialty. ^c Includes physical therapist visits. ^d Includes neurosurgeon visits. ^e Physical therapist visits only. ^f Massage therapist and/or AC visits.

Conclusion: Chiropractors, as primary spine care providers in the United States, are playing an increasingly larger role in the diagnosis and treatment of BP, with 7%-45% of patients with BP seeking chiropractic care. However, there are conflicting data on the types of BP treated by chiropractors in the United States. Nonetheless, since approximately 15% of patients with IBP have axSpA,^{1,2} it is very likely that many patients seeking care from chiropractors in the United States have undiagnosed axSpA. This reveals a need for a systematic investigation for the presence of axSpA among patients being treated by chiropractors. Specific educational strategies targeted to chiropractors should be applied to increase awareness of axSpA and achieve early referral to rheumatologists for these patients.

REFERENCES

- 1 Weisman MH, et al. *Ann Rheum Dis*. 2013;72:369-373.
- 2 Reveille JD, et al. *Arthritis Care Res (Hoboken)*. 2012;64:905-910.
- 3 Danve A, et al. *Clin Rheumatol*. 2018 Dec 26. [Epub ahead of print].
- 4 Beliveau PJH, et al. *Chiropr Man Therap*. 2017;25:35.
- 5 Deodhar A, et al. *Arthritis Rheumatol*. 2016;68:1669-1676.

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AB0719

PREVALENCE OF UNDIAGNOSED AXIAL SPONDYLOARTHRITIS IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE: A SYSTEMATIC LITERATURE REVIEW AND PRIMARY RESEARCH STUDY

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Background: Axial spondyloarthritis (axSpA) encompasses psoriatic arthritis with axial disease, ankylosing spondylitis and non-radiological axSpA. Patients with axSpA have a high burden of inflammatory bowel disease (IBD) but few studies have investigated the proportion of IBD cases that have undiagnosed axSpA. Untreated axSpA could have a significant impact on the general health and quality of life of patients; therefore early diagnosis and treatment is crucial^[1].

Objectives: This systematic literature review (SLR) aimed to identify the prevalence of undiagnosed axSpA in IBD cases based on cross-sectional imaging (MRI and CT scans) of the axial skeleton from published data.

Methods: This SLR was performed in keeping with MOOSE guidelines for observational studies. Original articles in all languages from 1990-2018 were retrieved from PubMed, Embase and Cochrane databases. Article reference lists were checked for further literature. Rheumatology conference (ACR, EULAR, GRAPPA, BSR, Gent Spondyloarthritis) abstract lists from 2012-2018 were reviewed and authors contacted for any additional unpublished data. All abstracts were reviewed by two authors to determine eligibility for inclusion.

Results: Twenty observational studies were identified: twelve published papers and eight abstracts. Thirteen studies assessed the prevalence of CT-sacroiliitis in IBD cases, two used magnetic resonance enterography (MRE) imaging and five used MRI imaging. The studies included a variety of patient demographics and IBD types. Sample sizes ranged between 25-1247 patients. Eleven studies included 2 independent radiology readers. The presence of inflammatory back pain was assessed in 7/20 studies, 5/20 included a control group and only 3/20 included a clinical rheumatology assessment. Thirteen studies used IBD imaging to assess for sacroiliitis compared to seven using dedicated MRI or CT imaging of the sacroiliac joints. The prevalence of sacroiliitis ranged from 2.2% to 68%. Eleven studies included patients with Crohn's disease (average sacroiliitis prevalence 18.6%) and Ulcerative colitis (average sacroiliitis prevalence 17.4%), with 7/11 studies stating no significant difference in the prevalence of sacroiliitis between the two groups. Four studies identified an association of sacroiliitis with increased disease duration, two with increasing age and only one with IBD location.

Conclusion: From these studies, it appears that axSpA may affect a substantial number of patients with IBD and is likely to be significantly underdiagnosed. Cross-sectional imaging intended for the assessment of IBD can be utilised to screen for the presence of axSpA, perhaps even before the onset of musculoskeletal symptoms. Such patients could then be triaged for detailed rheumatological assessment. This review highlights the sparsity of data on the prevalence of axSpA in IBD cases. Few studies have included a clinical rheumatological assessment and just over half assessed for any potential difference in the prevalence of sacroiliitis in the Crohn's disease (CD) and Ulcerative colitis groups. This review has informed our prospective cross-sectional single-centre observational study, due to start in February 2019. We will assess the sensitivity and specificity of MRE as a screening tool for axSpA in a cohort of 600 CD cases, using clinical assessment and a dedicated axial MRI scan as the gold standard.

REFERENCES

- 1 Ozgul, A., et al., *Effect of ankylosing spondylitis on health-related quality of life and different aspects of social life in young patients*. *Clin Rheumatol*. 2006. 25(2): p. 168-74.

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