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Comparison of Pain, Pain Burden, Coping Strategies, and Attitudes Between Patients with Systemic Sclerosis and Patients with Rheumatoid Arthritis: A Cross-Sectional Study

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Abstract

Objectives. To analyze pain in systemic sclerosis (SSc), especially its impact and coping strategies, compared with the reference painful inflammatory rheumatological condition, rheumatoid arthritis (RA).

Methods. We carried out a cohort study of consecutive inpatients with SSc and RA visiting three university hospitals. We analyzed pain, pain-related interference with daily life, pain catastrophizing, and attitudes, together with quality of life (QoL).

Results. In total, 173 patients were included and 153 were analyzed: 82 SSc and 71 RA patients. Pain frequency did not differ between the two groups (60.8% and 73.1%, respectively), but pain dimension scores in SSc patients were not correlated with disease activity and were significantly lower than those in RA patients. A neuropathic component was associated with higher pain scores in both conditions. Pain was more frequent and more intense in patients with diffuse cutaneous SSc than in patients with limited SSc, but its impact was similar. Pain and its functional consequences interfered less with daily life in SSc than in RA, consistent with the lower expectations concerning the benefits of drug treatment in SSc. However, pain catastrophizing played an important role in both groups.

Conclusion. Pain intensity and dimension scores are lower in SSc patients, particularly those with limited disease, than in RA patients and are not correlated with disease activity. In both conditions, a neuropathic component is associated with higher pain scores and pain catastrophizing is frequent.

Key Words. Pain; Rheumatoid Arthritis; Systemic Sclerosis; Coping Strategies; Catastrophizing

Systemic sclerosis (SSc) is a rare clinically heterogeneous generalized disorder [1–3], where, by contrast to rheumatoid arthritis (RA), pain is not generally considered a major symptom and not included in assessments of disease severity. A few studies have considered pain in SSc mostly on the basis of data from the Canadian SSc registry [4–9], and little is known about the impact of pain on quality of life (QoL) in SSc patients.

In RA, pain is clearly articular, whereas patients with SSc may suffer pain of diverse origins, including arthralgia, skin distension, myopathy, esophageal dismotility, and intestinal pseudo-obstruction. The main objective of this study was to investigate pain mechanisms (e.g., neuropathic), and the impact of pain in inpatients with SSc, compared with RA inpatients, the most frequent painful inflammatory joint condition. We specifically analyzed pain catastrophizing and attitudes in the two groups, and we

also compared pain in two subsets of SSc patients: limited and diffuse cutaneous SSc. This study should improve the recognition and understanding of pain in SSc, an essential step toward improving the management of this debilitating disorder for which there is no known curative treatment.

Patients and Methods

Study Design and Inclusion Criteria

This study incorporated baseline data from a prospective multicenter cohort study including consecutive inpatients with SSc and RA. The study focused primarily on SSc; the RA group was included for comparison, as a reference painful rheumatological disorder.

Adult patients (over the age of 18 years) diagnosed with SSc or RA were recruited from two rheumatology departments and one internal medicine department, all university hospitals in Paris, France. Consecutive inpatients fulfilling the criteria for SSc [3] or RA [10] were included between October 2009 and February 2010. We excluded patients with a history of psychiatric disorders, patients unable to complete specific questionnaires, SSc patients with end-stage organ involvement or recent severe complications (Medsger's severity class IV) [11], and patients with other inflammatory rheumatic diseases (e.g., psoriatic arthritis and ankylosing spondylitis). SSc was also classified, according to the criteria of LeRoy et al. [3], into two subtypes: limited and diffuse SSc.

In both groups, during the doctor's visit to the ward, eligible inpatients were provided with written and verbal information. Demographic and clinical variables were recorded at this time. The study protocol was approved by the National Ethics Committee/CCTIRS and the Commission Informatique et Liberté.

Demographic, Clinical, and Biological Data

We collected detailed information, including age, sex, disease duration (date of first non-Raynaud symptom), associated autoimmune disease, the presence of digital ulceration, results of tests for antinucleolar, anticentromere, and antitopoisomerase-I antibodies, presence of pulmonary fibrosis on computed tomography scans, measurements of forced vital capacity, and pulmonary hypertension confirmed by right heart catheterization. Drug treatment was recorded. The SSc patients were classified as having limited SSc or diffuse SSc, and SSc disease activity was assessed with the European Scleroderma Study Group (EScSG) preliminary activity indices [12], giving scores of 0–10.

The RA patients were assessed by calculating the Disease Activity Score for 28 joints (DAS28) [13] and by the completion of the Health Assessment Questionnaire (HAQ) [14]. RA patients were admitted to hospital for treatment administration or adaptation.

Assessments of Pain, Interference with Daily Life, and Pain-Coping Strategies

Pain was assessed with a visual analog scale (VAS; 0–100 mm), a body map of pain and the short form of McGill Pain Questionnaire (MPQ), which differentiates between sensory and affective components [15,16]. The DN4 questionnaire was used to assess the neuropathic pain component [17], with a score superior to 4 on 10. Specific pain symptoms were investigated: joint pain, skin pain, gastrointestinal pain, Raynaud's phenomenon, muscular pain, and diffuse pain. Interference with daily life due to pain was analyzed with the Brief Pain Inventory (BPI) [18].

QoL, Functional, and Psychological Assessment

We used the HAQ-DI to measure self-reported physical disability in RA [14] and SSc patients.

The Hospital Anxiety and Depression Scale (HADS) questionnaire [19] was used to screen for psychiatric comorbid conditions, with scores superior to 7 for both anxiety and depression. Depression was also screened with the Beck Depression Inventory.

Pain catastrophizing affects the perception of pain by individuals, and we used the Pain Catastrophizing Scale[20], with three subscales to assess rumination, magnification, and helplessness. Pain control beliefs were assessed with the French version [21] of the 30-item version of the Survey of Pain Attitude (SOPA) [22], the SOPA-B, including seven subscores (solicitude, emotion, medical cure, control, physical harm, disability, and medication).

QoL was assessed with the SF-12 [23,24].

Assessment of Sleep Problems

We used a five-item scale to assess individual sleep problems over the last 4 weeks. The questions covered the following components of sleep: onset, maintenance, wakefulness, snoring, and nonrestorative sleep. A score of 0–5 was assigned to each response and then summed to give a total sleep problem score up to 25.

Statistical Analysis

The data were analyzed with SPSS, version 17.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistics are presented as the mean ± standard deviation for continuous data and as percentages or absolute frequencies for categorical data. For continuous data, the two groups of patients studied were compared by one-way analysis of variance (ANOVA). For categorical data, the proportions for each group were compared in chi-squared tests. Fisher's exact test was performed in cases of group proportions equal to 0. *P* values less than 0.05 were considered significant.

Table 1 Demographic characteristics of the patients

	SSc Group (N = 82)	RA Group (N = 71)	*P* SSc vs RA
Age, mean ± SD years	59.2.1 ± 12.3	55.0 ± 14.1	NS
BMI mean ± SD	26.0 ± 11.4	27.2 ± 6.0	NS
Sex ratio (M/W)	17.1% men	10.0% men	NS
Current smoker	11.0%	17.4%	NS
Former smoker	21.7%	17.1%	NS
On sick leave/disability allowance	29 (35.3)	17 (23.9)	$P < 0.05$
RA activity: DAS28, mean ± SD	NA	2.6 ± 1.17	NA
SSc disease activity (out of 10) mean ± SD	6.0 ± 3.9	NA	NA
HAQ score mean ± SD	1.5 ± 1.0	1.9 ± 1.0	$P < 0.05$

BMI = body mass index; DAS28 = Disease Activity Score for 28 joints; HAQ = Health Assessment Questionnaire; NS = nonsignificant; NA = not appropriate; RA = rheumatoid arthritis; SD = standard deviation; SSc = systemic sclerosis.

Correlation between pain intensity (VAS) and several continuous variables, like disease activity scores (DAS28 for RA and EScSG for SSc), anxiety and depression levels (HADS continuous scores), and sleep interference (VAS) were assessed by Pearson correlation coefficient.

Results

Demographic and Clinical Data: Table 1

In total, 173 patients were enrolled in the study, but only 153 were analyzed due to missing data: 82 SSc and 71 RA patients; 21 men and 131 women. The characteristics of the study population are shown in Table 1.

The patients in the SSc group were classified as having limited cutaneous SSc (55% of the cases) or diffuse SSc (45% of the cases). A few (5.6%) had pulmonary hypertension, but almost half had pulmonary fibrosis (46.8%) and gastroesophageal involvement (44.4%). A minority had active digital ulcers (17.5%) and active lower limb ulcers (4.9%). Active joint involvement with synovitis was observed in 18.8% of the patients, and subcutaneous calcinosis was found in 22.8%. The mean EScSG preliminary activity index was 6.0 ± 3.9, demonstrating that our patients generally had severe SSc.

The patients in the RA group had low levels of disease activity (DAS28 2.6 ± 1.2) but displayed high levels of physical disability (HAQ score 2.2 ± 0.7). All RA patients were taking disease-modifying antirheumatic drugs, and two thirds of the RA patients (65.2%) had been prescribed antitumor necrosis factor (anti-TNF) agents.

Reported Pain Symptoms and Pain Analyses: Table 2

The pain symptoms reported by the patients are summarized in Table 2.

Pain Frequency, Intensity, and Location: Figure 1

Pain frequency was very similar in the two groups of patients: 73.1% of the RA and 60.8% of the SSc patients reported pain. Unpaired *t*-test demonstrated that pain intensity was significantly lower in SSc patients than in RA patients: 4.1 ± 2.5 vs 5.4 ± 2.2 over the last 7 days and 2.9 ± 2.6 vs 4.6 ± 2.9 at the time of the visit ($P < 0.001$). ANOVAs demonstrated that pain was significantly more diffuse in SSc patients than in RA patients, with pain felt in the skin and muscle. Joint pain was reported as the most severe symptom by 77.6% of the RA patients but by only 35.6% of SSc patients ($P < 0.05$). Pearson correlation coefficient analyses demonstrated that pain intensity was correlated with disease activity (as assessed with the DAS28-C reactive protein) in RA patients ($r = 0.55$, $P = 0.002$) but not in SSc patients ($r = 0.15$, $P = 0.07$).

Neuropathic Component

We used the DN4 questionnaire to screen for a neuropathic component in painful areas. Such a component was detected in 35.7% of RA patients and 46.3% of SSc patients, and this difference was not significant. Total DN4 score was not high.

Sensory and Affective MPQ Pain Scores

T-test demonstrated that MPQ sensory score was significantly lower ($P < 0.05$) in SSc patients (6.8 ± 6.6) than in RA patients (10.8 ± 6.9). MPQ affective score was also significantly lower ($P < 0.01$) in SSc patients (2.7 ± 3.1) than in RA patients (5.4 ± 4.3).

QoL and Interference with Life Activities

No difference was found for either of the SF-12 questionnaire subscores (patient's physical and mental states) in RA and SSc.

Both SSc and RA patients had similarly severely impaired sleep. Pain intensity and depression (continuous HADS scores) were correlated with higher sleep disruption (sleep interference): $r = 0.6$ $P = 0.023$, $r = 0.67$ $P = 0.005$, respectively.

Table 2 Pain symptoms in SSc and RA patients

Pain Symptoms	SSc (N = 82)	RA Group (N = 71)	*P* SSc vs RA	Effect Size
Presence of pain	60.8%	73.1%	Chi^2: 2.40 *P* = 0.1211 (NS)	Phi –0.1305
Mean VAS score for pain over the last 7 days mean ± SD	4.2 ± 2.5	5.4 ± 2.2	ANOVA: 9.96 *P* = 0.0020	Eta square 0.0633
Current VAS pain score mean ± SD	3.0 ± 2.6	4.6 ± 2.9	ANOVA: 12.70 *P* = 0.0005	Eta square 0.0811
Worst pain during the last 24 hours (mean ± SD)	4.3 ± 2.7	5.7 ± 2.7	ANOVA: 9.08 *P* = 0.0030	Eta square 0.0511
Weakest pain during the last 24 hours (mean ± SD)	2.0 ± 2.1	3.3 ± 2.5	ANOVA: 10.60 *P* = 0.0014	Eta square 0.0617
Diffuse pain	44.4%	28.6%	Chi^2: 2.56 *P* = 0.1096 (NS)	Phi 0.1650
Significant areas involved				
Wrist (left)	15.6	35.3	Chi^2: 7.51 *P* = 0.0061	Phi –0.2277
Thigh (right)	12.8	2.9	Chi^2: 4.70 *P* = 0.0302	Phi 0.1794
Knee	21.5	38.2	Chi^2: 5.70 *P* = 0.0037	Phi –0.1787
Ankle	13.8	29.4	Chi^2: 6.17 *P* = 0.0071	Phi –0.4771
Cutaneous pain	26.7%	2.0%	Chi^2: 11.96 *P* = 0.0006	Phi 0.3564
Muscle pain	17.8%	4.1%	Chi^2: 4.63 *P* = 0.0314	Phi 0.2219
Pain related to Raynaud's phenomenon	33.3%	0%	Chi^2: 19.43 *P* < 0.0001	Phi 0.4547
Joint pain	35.6%	77.6%	Chi^2: 16.92 *P* < 0.0001	Phi –0.4243
Abdominal pain	11.1%	4.1%	Chi^2: 1.68 *P* = 0.1947	Phi 0.1338
MPQ sensory component (mean ± SD)	7.0 ± 6.6	10.8 ± 6.9	ANOVA: 5.99 *P* = 0.0167	Eta square 0.0601
MPQ affective component (mean ± SD)	2.7 ± 3.1	5.4 ± 4.3	ANOVA: 10.42 *P* = 0.0018	Eta square 0.1206
DN4 score (mean ± SD)	3.3 ± 2.3	3.2 ± 1.9	ANOVA: 0.34 *P* = 0.5614	Eta square 0.0023
Neuropathic component (DN4+)	46.3%	35.7%	Chi^2: 1.71 *P* = 0.1911	Phi 0.1067

ANOVA = analysis of variance; MPQ = McGill Pain Questionnaire; RA = rheumatoid arthritis; SD = standard deviation; SSc = systemic sclerosis; VAS = visual analog scale.

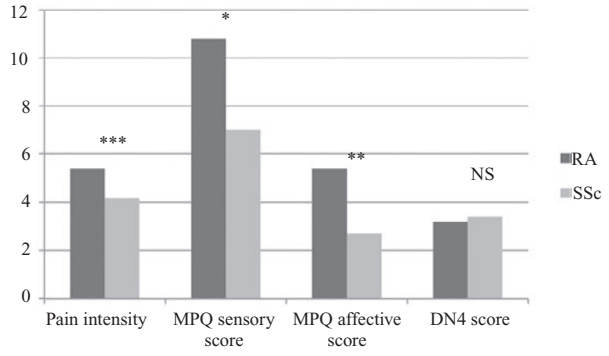
T-test analyses of interference with daily life due to pain (Figure 2) demonstrated that pain had a significantly greater impact in RA than in SSc patients ($P = 0.009$): Significant differences were found between the two groups of patients for general activity ($P < 0.0001$), mood ($P < 0.01$), ability to walk ($P < 0.001$), current work ($P < 0.001$), relationships with others ($P < 0.001$), and enjoyment of life ($P < 0.05$), but not for sleep.

Functional impairment was severe in both groups of patients, but was significantly greater ($P < 0.05$) in RA patients (HAQ-DI = 1.9 ± 1.0) than in SSc patients (HAQ-DI = 1.5 ± 1.0).

Psychological Impact and Comorbidities

The psychological variables in SSc and RA are summarized in Table 3.

Anxiety and depression did not differ between SSc and RA patients. Pain catastrophizing scores were similar in



*$P<0.05$, **$P<0.01$, ***$P<0.001$

Figure 1 Comparison of pain intensity, pain dimension scores (McGill Pain Questionnaire [MPQ] questionnaire), and the presence of a neuropathic component between systemic sclerosis (SSc) and rheumatoid arthritis (RA) patients.

RA and SSc patients globally and for any of the three dimensions: rumination, magnification, and helplessness.

Pain Attitudes: SOPA

ANOVAs demonstrated that significant differences were detected for only two of the seven dimensions of the SOPA: emotion ($P < 0.05$) and medication ($P < 0.0001$). The scores for all dimensions were very high in both conditions, but the effects of emotion on pain and the expectations of drug treatments were greater in RA patients than in SSc patients. We also found no difference in attitude to pain between patients with limited and diffuse cutaneous SSc.

Differences in Pain Between Diffuse and Limited Cutaneous SSc

In this last part of the study, we investigated differences in pain and its consequences between patients with two subtypes of SSc, limited and diffuse. The data are summarized in Table 4.

Pain frequency and pain intensity were lower in patients with limited than in those with diffuse SSc. A neuropathic component was detected similarly in both groups. Joint, visceral, and diffuse pain were more frequent in patients with diffuse SSc. These differences had no impact on psychological comorbid conditions, as levels of depression and anxiety and pain attitudes were similar in the two groups. ANOVAs demonstrated that global pain catastrophizing and two of the subscores (helplessness and magnification) did not differ between the two subgroups of SSc patients, but there was a nonsignificant trend ($P = 0.051$) toward lower pain catastrophizing scores for patients with limited cutaneous SSc than for those with diffuse cutaneous SSc. Skin calcinosis, which was found in 22.8% of the SSc cases, showed a nonsignificant tendency to be associated with slightly higher pain intensity.

Discussion

Pain in SSc: Comparison with Previous Studies

SSc is a life-threatening disorder in which pain has been much less studied [25,26] than in RA, in which pain is considered to be the main symptom and is included as a disease activity biomarker. Few studies have assessed the prevalence of pain in SSc [4–7], with pain occurring in 60–83% of patients, confirmed by our findings, as 60.8% of our SSc patients were affected. Our results

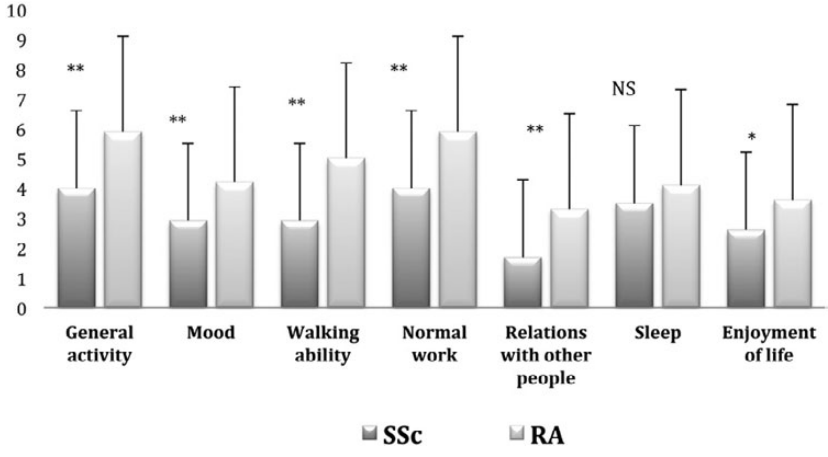


Figure 2 Comparison of the interference of pain with daily life in systemic sclerosis (SSc) and rheumatoid arthritis (RA) patients, as assessed with the Brief Pain Inventory. General activity: $P = 0.0002$; mood: $P = 0.0096$; walking ability: $P = 0.0002$; normal work: $P = 0.0003$; relationships with other people: $P = 0.0002$; sleep: nonsignificant (NS); enjoyment of life: $P = 0.038$. **$P < 0.001$, *$P < 0.05$.

Table 3 Comparison of psychological variables in SSc and RA patients

Psychological Variable	SSc (N = 82)	RA Group (N = 71)	*P* SSc vs RA	Effect Size
BDI score (mean ± SD)	7.0 ± 5.9	7.5 ± 5.5.4	ANOVA: 0.27 *P* = 0.5998	Eta square 0.0021
HADs anxiety score (mean ± SD)	9.2 ± 4.3	9.1 ± 3.8	ANOVA: 0.00 *P* = 0.9423	Eta square 0.0000
HADs depression score (mean ± SD)	6.3 ± 4.2	7.4 ± 4.2	ANOVA: 2.11 *P* = 0.1480	Eta square 0.0150
Pain Catastrophizing Scale (PCS): total score (0–52)	16.3 ± 12.3	17.6 ± 13.2	ANOVA: 0.31 *P* = 0.5781	Eta square 0.0028
Rumination (0–16)	5.8 ± 4.7	5.8 ± 4.8	ANOVA: 0.00 *P* = 0.9919	Eta square 0.0000
Magnification (0–12)	3.6 ± 3.0	3.5 ± 3.1	ANOVA: 0.05 *P* = 0.8269	Eta square 0.0004
Helplessness (0–24)	6.9 ± 6.0	8.3 ± 6.5	ANOVA: 1.57 *P* = 0.2129	Eta square 0.0050
SOPA				
Solicitude	1.6 ± 1.2	1.6 ± 1.0	ANOVA: 0.03 *P* = 0.8740	Eta square 0.0003
Emotion	1.7 ± 1.2	2.3 ± 1.2	ANOVA: 5.44 *P* = 0.0218	Eta square 0.0531
Medical cure	2.4 ± 0.5	2.4 ± 0.5	ANOVA: 0.67 *P* = 0.4143	Eta square 0.0069
Control	2.0 ± 0.9	2.0 ± 0.8	ANOVA: 0.01 *P* = 0.9171	Eta square 0.0001
Physical harm	2.0 ± 1.0	2.1 ± 1.0	ANOVA: 0.09 *P* = 0.7581	Eta square 0.0010
Disability	2.2 ± 0.7	1.9 ± 0.9	ANOVA: 2.43 *P* = 0.1219	Eta square 0.0245
Medication	2.4 ± 1.1	3.3 ± 0.6	ANOVA: 21.74 *P* < 0.0001	Eta square 0.1733

ANOVA = analysis of variance; BDI = Beck Depression Inventory; RA = rheumatoid arthritis; SD = standard deviation; SOPA = Survey of Pain Attitude; SSc = systemic sclerosis.

Table 4 Comparison of the limited and diffuse cutaneous SSc subgroups

	Limited SSc Group (N = 45)	Diffuse SSc Group (N = 35)	*P* Limited vs Diffuse
Age, mean ± SD years	62.2 ± 13.1	57.0 ± 14.1	<0.05
Sex ratio (M/W)	4.4% men	32.4% men	<0.001
Pain frequency	50%	77%	<0.05
Mean pain intensity (mean ± SD)	3.7 ± 2.3	4.8 ± 2.4	<0.05
Neuropathic component (DN4+)	42.2%	51.4%	NS
Diffuse pain	34.8%	54.5%	<0.05
Cutaneous pain	21.7%	31.8%	NS
Joint pain	11.6%	27%	*P* < 0.05
Visceral pain	4.3%	18.2%	*P* < 0.05
Anxiety (HADS)	29.3%	31.4%	NS
Depression (HADS)	12.2%	17.1%	NS
Pain Catastrophizing Scale (PCS): total score (0–52)	14.3	19.6	NS

HADS = Hospital Anxiety and Depression Scale; NS = nonsignificant; SD = standard deviation; SSc = systemic sclerosis.

demonstrate that pain is not correlated with disease severity in SSc, by contrast to what has been reported for RA. In fact, we may consider a bias in this comparative correlation analysis as pain assessment is included in RA disease activity score, in one item assessing painful joint, although pain is not included in SSc disease activity score. VAS and MPQ scores indicated that pain was more frequently mild and less severe in SSc than in RA patients. These findings conflict with those of another study comparing pain in SSc and RA patients [27] that reported similar bodily pain scores for the SF36 questionnaire in 76 patients with SSc and 118 patients with RA.

Several studies have assessed pain in subsets of patients with limited SSc and diffuse SSc [4,28–30]. All these studies reported pain scores to be higher in patients with diffuse SSc than in those with limited SSc, as in our study, on a relatively small number of patients.

MPQ analyses demonstrated that the sensory and affective scores were significantly lower in SSc patients than in RA patients. One recent study on pain in SSc [9] focused on MPQ characteristics in SSc patients and demonstrated a large overlap between MPQ sensory and affective scores, and our results are consistent with these findings.

In most studies, pain in SSc patients has been shown to be associated with Raynaud's phenomenon, active skin ulcers, synovitis [26], and gastrointestinal symptoms [7]. We also wished to differentiate between different types of pain (nociceptive and neuropathic) because little is known about neuropathic pain in SSc and RA. We asked both SSc and RA patients whether one particular area of the body was painful, and we completed the DN4 questionnaire [17] for that part of the body. Unexpectedly, the DN4 questionnaire indicated the presence of neuropathic pain in 46.3% of the SSc patients and 35.7% of the RA patients. The neuropathic component [31] was not associated with any specific pain symptom. In our study, 18% of the RA patients and 19.1% of the SSc patients were prescribed antidepressants, but mostly for the treatment of depression, and none of our patients received anticonvulsants.

Psychological Involvement in SSc and RA

Levels of depression and anxiety were not particularly high in our patients, by contrast to the findings of other studies, in which up to 46% of SSc patients were reported to have depression [32,33]. Our results for the HADS questionnaire are very similar to those obtained with the same questionnaire by Nguyen et al. [34] and Thombs et al. [35]. This may reflect the nature of the patients studied: in our study, all the patients were closely followed by SSc and RA specialists, at specific centers, with annual disease assessment. It may also be related to the screening test used, several studies have made use of the Center for Epidemiologic Studies Depression scale, for which scores may be affected by somatic complaints in RA [36] and, to various extents, in SSc [35]. Contrary to previous authors [37,38], we found no correlation between anxiety or depression and a specific somatic involvement or type of pain, but this may be because our sample size was small.

Pain Coping in SSc: Pain Catastrophizing and Pain Attitudes

We compared pain coping strategies in SSc and RA patients, bearing in mind that pain is not considered to be a biomarker of disease severity in SSc contrary to RA.

One previous study investigated catastrophizing in SSc patients [39] and showed that educational level moderated the relationship among catastrophizing, affective pain, and social function. We found no difference in pain catastrophizing, in terms of total score or any of the three specific subscores, between SSc and RA patients, although pain is a cardinal symptom of RA but not of SSc. This suggests that pain intensity and frequency may not be important factors underlying pain catastrophizing in SSc patients. However, patients with limited SSc tended to catastrophize more than those with diffuse SSc.

We found that depression and anxiety were associated with higher pain catastrophizing scores in SSc and RA. Previous reports have suggested that the predictors of pain catastrophizing in RA are: dispositional pessimism, passive pain coping strategies, venting (as a pain coping behavior), and a feeling of helplessness about arthritis [40].

Patients' attitudes and beliefs about pain and its treatment are increasingly being assessed in pain management [41,42]. The first published scale was the Pain SOPA, a short version of which [22] was translated into French [43] and validated in Canadian French [21]. We found that the scores for two of these subscales, emotion and medication, were significantly higher in RA patients than in SSc patients. These findings are consistent with the greater affective component of pain in RA than in SSc patients and with the use of appropriate drugs to treat RA pain, whereas the pain suffered by SSc patients, despite being less intense, is probably less frequently treated and with less effective drugs due to its multiple causes.

Functional Impact of Pain in SSc

RA patients had significantly higher levels of functional impairment, as assessed with HAQ scores, and pain interference (assessed with the BPI) than SSc patients. However, QoL, as assessed with the SF-12, was severely impaired, to similar extents, in both SSc and RA patients. This impairment was observed for both the mental and physical scores. Finally, our study suggests that even though pain, functional impairment, and life interference related to pain scores are lower in SSc patients than in RA patients, QoL is nevertheless strongly affected in patients with SSc, as suggested by previous studies [5], with important impact of pain on work ability, previously described by Sandqvist et al. [44], comparable with that of fatigue.

Sleep was severely impaired in both groups of patients, in terms of perceived sleep quantity and quality, refreshing sleep, and consequences of sleep impairment, such as sleepiness during the day. We found no significant difference in sleep impairment between the two conditions or between the two subgroups of SSc patients. As in other studies [44–46], pain and depression had a significant impact on sleep disturbance in SSc.

Study Limitations

This study was subject to several limitations, which must be taken into account when interpreting the results. We studied consecutive inpatients referred to university hospitals for disease assessment for a cross-sectional data comparison. There was, therefore, probably a recruitment bias with the preferential inclusion of patients treated by rheumatologists. The sample size may have been too small to demonstrate significant differences, and patients with very severe SSc who were too sick to participate were not included in this study. This may have resulted in an overrepresentation of healthier patients in our sample. It may therefore not be possible to generalize the results to the full spectrum of SSc.

There were no differences between RA and SSc patients according to age, body mass index (BMI), and sex ratio (Table 1). Most of our analyses aimed at comparing RA and SSc patients, and thus may not be confounded by any bias like age, BMI, or sex ratio. Indeed, there was a higher number of men in the SSc group than in the RA group (17.1% vs 10.0%) that may not have reached statistical significant difference due to sample size, but given differences in pain reports between men and women, this could have an impact on the analyses.

When comparing diffuse and limited cutaneous SSc, age and sex ratio were different and thus may represent confounding factors.

The sampling of the two groups of patients may also have affected the results. Indeed, the SSc patients were consecutive patients admitted for their annual systematic screening, and most had stable disease. By contrast, the RA patients were consecutive patients admitted for biotherapy infusions (mostly anti-TNF drugs) or assessment because of unstable disease. The RA patients may thus have had more severe pain and may have accorded greater weight to pain and QoL parameters. However, as previously stated, our objective was not a direct comparison of these two groups, and the results for SSc patients derived from these validated questionnaires were very informative.

Conclusion

These findings confirm that pain should be included in assessments of SSc despite an absence of correlation with disease severity. Pain was as frequent in SSc as in RA, but less severe, with a weaker impact on function and on daily life and fewer patients' expectations. However, levels of pain catastrophizing were similar. In both diseases, a neuropathic component was associated with higher sensory and affective pain scores, whereas joint pain was not. The subset of patients with diffuse cutaneous SSc had pain of high severity, with a greater impact and more far-reaching effects on daily life. There is, therefore, a need for more precise pain assessment in SSc, adapted to both physical and psychological symptoms, but also to patients' expectations and attitudes, for more personalized pain management. Longitudinal studies of pain in SSc are now required to investigate the effects of these clinical covariates over time for the identification of causal associations and appropriate management.

Key Messages

- Pain levels do not reflect disease activity in SSc contrary to RA.
- A neuropathic pain component is associated with higher pain scores in both conditions.
- Pain catastrophizing scores are high in both conditions.
- Patients with diffuse cutaneous SSc have pain of high severity compared with limited cutaneous SSc.

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