Journal of Biomedical and Pharmaceutical Research
Available Online at www.jbpr.in
CODEN: - JBPRAU (Source: - American Chemical Society)
NLM (National Library of Medicine): ID: (101671502)
Index Copernicus Value 2021: 83.38
Research Article
Volume 10, Issue 2: March-April : 2021, 82-88
ISSN (Online): 2279-0594
ISSN (Print): 2589-8752

Etiology of various joint changes associated with cutaneous disorders: a study from central India

Dr. Mahesh Gosavi
Associate Professor Dept. of Skin and VD Srinivas Institute of Medical Sciences and Research Centre Mangaluru

Article Info: Received 09 February 2021; Accepted 10 March 2021
Corresponding author: Dr. Mahesh Gosavi

Abstract

Background: Dermatology frequently collaborates closely with other fields of research. One of the specialties with a lot of overlap is rheumatology. Skin and joints are often related, whether it is in the case of inflammatory arthropathies like psoriatic and rheumatoid arthritis, connective tissue disorders like scleroderma, systemic lupus erythematosus, or dermatomyositis, or infectious diseases like leprosy.

Aim: To investigate the causes of different joint alterations linked to cutaneous diseases.

Material and Methods: Musculoskeletal symptoms were checked for in all individuals with certain skin conditions. For these particular patients, a thorough history as well as a musculoskeletal and cutaneous examination were conducted. Every patient in the research had their joints radiographically examined.

Results: Fourty-six out of the 104 patients had Psoriatic Arthropathy (PSA), fifteen percent had Leprosy arthritic group, thirteen percent had Sclerodema arthritis, and eleven percent had SLE arthropathy.

Conclusion: In 46.2% of patients, psoriatic arthropathy was the most common joint change linked to cutaneous disorders. Other joint changes that were associated with cutaneous disorders included leprosy arthritic (15.4%), sclerodema arthritis (13.5%), and SLE arthropathy (11.5%).

Keywords: Cutaneous disorders, joint changes, psoriatic arthropathy.

Introduction

The skin and joints are impacted by numerous inflammatory, metabolic, and viral illnesses. The majority of these are regarded as rheumatic diseases with subsequent skin involvement, including rheumatoid arthritis and systemic lupus erythematosus[1-3]. Nonetheless, a number of basic cutaneous conditions are linked to arthritis and may even exhibit joint symptoms before developing cutaneous lesions. Common skin conditions with well-known musculoskeletal symptoms include psoriasis and acne[4,5]. Joint involvement is widespread in other less common disorders include dermatomyositis, multicentric reticulohistocytosis, pyoderma gangrenosum, Sweet's syndrome, and different cutaneous vasculitides[6]. The purpose of this research was to investigate the causes of different joint alterations linked to dermatological conditions.

Aim: to investigate the causes of different joint alterations linked to cutaneous diseases.

MATERIAL AND METHODS

A total of 104 participants were chosen from the patient base of a tertiary training hospital, which included outpatient dermatology, indoor dermatology, medicine, orthopaedics, and pediatrics. In order to include patients in the research, informed consent was obtained.

Individuals with cutaneous diseases exhibiting distinct joint involvement are eligible for inclusion. • Patients who have complained of joint discomfort, swelling, or deformity for longer than one month; and

Patients who are willing to participate in pertinent studies when needed. Criteria for exclusion:
Individuals who show no signs of arthritic changes
Joint pathology linked to other known causes, such as trauma.
Denying consent; • Patient having radiographic indications of overt osteoarthritis; • Unwilling to submit to pertinent examinations
Every patient with a skin condition visiting the dermatology outpatient department underwent screening for musculoskeletal issues, such as chronic deformities or joint pain lasting more than a month. Every patient with arthritis in this group was chosen for the investigation. Individuals who reported joint discomfort but did not exhibit soreness, swelling, or restricted movement—clinical signs of arthritis—were not accepted. For these particular patients, a thorough history as well as a musculoskeletal and cutaneous examination were conducted. Every patient in the research had their joints radiographically examined. Radiographs were only taken of joints exhibiting symptoms of arthritis, such as pain, edema, or decreased range of motion. The radiologist evaluated the radiographs and noted on the proforma any findings in each individual joint. Individuals who had clear radiological signs of trauma or osteoarthritis, two other common causes of arthritis, were not included. Clinical considerations were used to make the diagnosis of skin disease. Skin biopsies were performed when in question, and only verified cases were included. Descriptive statistics were used in the statistical analysis.

RESULTS

Table 1: Case wise distribution of research population

Clinical presentation	No of cases	Percentage (%)
Psoriasis	48	46.2%
Scleroderma Diffuse Localized	12	11.5%
	2	1.9%
SLE	12	11.5%
Dermatomyositis	4	3.8%
Gout	2	1.9%
Crohn's disease	2	1.9%
Behcet's disease	4	3.8%
Multicentric reticulohistiocytosis	2	1.9%
Leprosy	16	15.4%
Total	104	100%

In our research population, cases of psoriatic arthropathy formed the majority (46.2%). There was a noticeable male majority (53.8%) in the research population. In our research population, the fifth decade had the highest percentage of instances (26.7%).

Psoriatic arthropathy

There were 62 DIP joints that were clinically involved in all. Among these, or 48 joints, there was a 77.4% limitation of motion. Of these, 40 joints (83.3%) had radiological involvement. Of the 40 PIP joints that were clinically affected, 80% had radiological abnormalities. The ankle and knee were the most frequently affected big peripheral joints, accounting for 25% and 20.8% of cases, respectively. Of the patients, 33.33% had involvement of the MCP joints. Joint involvement of the DIP and PIP was observed in 45.8% and 33.3% of cases, respectively. In our research population, RA-like arthritis accounted for 33.3% of all cases, with oligo-articular arthritis coming in second at 29.2%. On average, skin involvement occurred 6.4 years before joint involvement. In 12.5% of patients, arthopathy developed after psoriatic skin lesions at an average of 3.3 years. Prior to arthropathy, skin disease was shown to be far more common—in 42 out of 48 individuals, or 83.3%. (P=0.002 Significant; Chi square=9.3, df=1). Only a small percentage of patients (less than thirty percent)

in each of the subtypes of arthritis experienced skin lesions. Per patient, the average number of afflicted joints ranged from 4 to 10.8%. Less than 30% of patients with psoriatic arthropathy exhibited skin involvement, a considerably higher percentage (Mann Whitney Z =20193, P=0.027 Significant).

Table 2: Type of Skin Involvement and Subtype of Arthritis

Type of skin disease	No. of pts	M/F	Avg. no of joints	Oligo-articular	DIP	RA like	Arthritis mutilans	Axial
Chronic plaque	42	34/8	11.4	14	4	12	0	12
Palmoplantar	2	0/2	8	0	0	2	0	0
Gen. pustular	2	0/2	8	0	0	2	0	0
Erythroderma	2	0/2	8	0	2	0	0	0
Total	48	34/14		14	6	16	0	12

A notably greater proportion of patients, 42 out of 48 (87.5%), had psoriasis with persistent plaques (chi square=12.04, df=1, P<0.001 HS). In cases of psoriasis with chronic plaque, the average number of afflicted joints was 5.7.

Table 3: Subtypes of SLE Arthritis

Type of arthritis	No of cases	Avg age at onset of joint changes	Avg no of joints involved
Jaccoud's arthropathy	0	0	0
Erosive arthropathy	4	4	5.5
Mild deforming arthropathy	2	18.5	1
Non-deforming arthropathy	6	21	5.5

Of the twelve SLE arthropathy patients, six had non-deforming arthropathy and four had erosive arthropathy. The erosive and non-deforming type had an average of 5.5 more joints involved than the mildly deforming type (1).

Table 4: Comparison of ACR Criteria in SLE Arthropathy

ACR criteria	Erosive (n=4)	Mild deforming (n=4)	Non-deforming (n=12)	Total
Malar rash	2/4	2/2	6/6	10
Discoid rash	0/4	0/2	0/6	0
Photosensitivity	4/4	2/2	6/6	12
Oral ulcers	4/4	2/2	6/6	12
Serositis	2/4	0/2	2/6	4
Renal	4/4	0/2	4/6	8
Neuro-psychological	0/4	0/2	6/6	6
Hematological	4/4	2/2	6/6	12
ANA	4/4	2/2	6/6	12
Immunological	4/4	0/2	6/6	10

All patients met the ACR criteria, which included photosensitivity, oral ulcers, hematological abnormalities, and ANA positive; however, 10 out of 12 individuals also developed malar rash. Because of the small number of patients seen, it was not possible to remark on their precise link with each form of arthritis. Soft tissue swelling, or 86.9% of the 46 joints involved, was the most frequent radiological

abnormality seen in SLE arthropathy, followed by joint subluxation and erosion (13% each).

Leprosy arthritis

Table 5: Subtypes of Arthritis in Leprosy

Type of arthritis	No. of cases	Avg. age at onset of joint changes	Avg. no of joints involved
Acute polyarthritis	6	40	10.66
Swollen hands and feet syndrome	4	44	7.5
Chronic arthritis	2	45	6
Charcot's arthropathy	4	46	7

The research group's leprosy patients began to exhibit joint alterations in their fourth decade of life. Six out of 16 patients (37.5%) presented with acute polyarthritic type, four patients (25%) with swollen hands and feet syndrome, and four patients (25%) with Charcot's arthropathy type. The largest number of joints affected on average (10.66) was seen in cases of acute polyarthritis.

Table 6: Comparison of Arthropathy with Respect to Type of Leprosy

Type of leprosy	Acute polyarthritis (n=6)	Swollen hands and feet syndrome (n=4)	Chronic arthritis (n=2)	Chronic arthritis (n=8)	Total
BT	4/6	2/4	0/2	0/4	6
BL	0/6	2/4	2/2	2/1	6
LL	2/6	0/4	0/2	2/4	4

The most common causes of arthritis symptoms were borderline TB and borderline lepromatous leprosy (37.5% in each case). In the tuberculous pole, the prevalence of acute polyarthritic type (4 of 6) and swollen hands and feet syndrome (2 of 4) was higher at 60% than in the lepromatous pole (2 of 6 and 0 of 4 respectively), which was 20%. Charcot's arthropathy, however, was more noticeable in the lepromatous pole (4 of 4). Arthritis and scleroderma: Of the sixteen leprosy patients, four had acute polyarthritis and type 1 reaction symptoms, while six had type 2 reaction symptoms along with hands and feet syndrome.

Table 7: Distribution of cases according to type of arthritis

Type of disease	Oligoarticular (%)	Polyarticular (%)	Total (%)
dcSSc	4 (28.57)	8 (57.14)	12 (85.71)
lcSSc	0	2(14.28)	2 (14.28)
Total	4 (28.57)	10(71.42)	14 (100)

In our research group, polyarticular arthritis was the most prevalent kind, occurring in 10 out of 14 (71.42%) of the patients. DIP joints made up the majority of the affected joints (94.8%).

Table 8: Comparison of skin findings with type of arthritis

Features in SSc	Oligoarticular (n=4)	Polyarticular (n=10)	Total (n=14)
Cutaneous sclerosis	4/4	10/10	14/14
Raynaud's Phenomenon	4/4	10/10	14/14
Finger-tip ulceration/scars	4/4	10/10	14/14
Restricted mouth opening	4/4	8/10	12/14
Salt and pepper appearance	4/4	8/10	12/14
Fingertip resorption	2/4	10/10	12/14

Diffuse Hyperpigmentation	2/4	6/10	8/14
Finger contractures	4/4	10/10	14/14
Nail changes	2/4	6/10	8/14
Ulceration at bony prominences	4/4	10/10	14/14
Gangrene of fingers	2/4	0/10	2/14
Calcinosis cutis	0/4	2/10	2/14
Gastrointestinal	4/4	10/10	14/14
Respiratory system	2/4	4/10	6/14
Renal system	0/4	0/10	0/14
Aneamia	4/4	4/10	8/14

The most frequent initial signs of scleroderma combined with arthritis were cutaneous sclerosis, RP, ulcerations on the tips of fingers, and ulcerations at bony prominences. Gastrointestinal problems were more common among systemic symptoms.

Dermatomyositis and arthritis

Four cases of dermatomyositis with arthritis were observed by us. They were all men, ages 45 and 52 at the time of presentation. The time interval between the clinical diagnosis and the start of arthritis is one year and six months, respectively. the total number of joints (3.5 on average) that are involved. While Shawl and V signs were only found in the first patient, both the heliotrope rash and Gottron's sign were observed in both individuals. Both had stiffness in the morning. The pauci-articular kind of arthritis that primarily affected big joints like the wrists and ankles was present in both cases. There were no systemic symptoms in any patient. Both individuals showed radiologically only soft tissue edema and no erosive alterations.

Behcet's disease and arthritis:

Four of the arthritic instances were Behcet's disease cases; the average age at presentation was 24.5 years, and the cases were male and female, ages 28 and 25, respectively. A year after the condition was diagnosed, both showed signs of joint damage. In all, eight joints were affected in each patient. Oral and vaginal ulcers were recurrent in both patients. While the second patient had bilateral conjunctivitis, the first patient also exhibited EM-like skin lesions and a positive allergy test. Both had oligoarticular arthritis, which affects big joints like the knees and wrists. Radiography revealed soft tissue swelling, despite the fact that the first patient's joint had obvious erosive alterations in it.

Gout and arthritis

We also presented a 43-year-old female patient with tophaceous gout who began with a skin condition at the age of 35, resulting in tophi over both ankles and feet, and a joint disease that started 1 year later. She has a history of stiffness in the mornings. There were erosive alterations in the right ankle joint and joint effusion in both the ankle and tarsal joints. She was an unimpressive system.

Multicentric reticulohistiocytosis

A fifty-year-old man arrived with extremely painful and incapacitating joint pains. Four months later, he developed firm, reddish-brown, firm, non-tender papules and nodules over his arms, lower abdomen, back, buttocks, and bilateral knees and feet. He also had limited mobility in his metacarpophalangeal, proximal and distal interphalangeal, knee, elbow, and shoulder joints. On X-ray, the hands displayed flexion deformity in the distal interphalangeal joints together with moderate osteopenia. Diffuse histiocytic infiltration supported the multicentric reticulohistiocytosis diagnosis histopathologically.

Crohn's disease and arthritis

A 30-year-old man who has been diagnosed with Crohn's disease for three years reported having arthritis in both knees as well as recurrent mouth pain. One year after the disease's diagnosis, three months after the emergence of oral lesions, the arthritic manifestation began. She reported having stiffness in the morning and a transient

joint ache that affected her main joints. Radiography showed no erosive changes or joint effusion, only soft tissue swelling in both knees.

DISCUSSION

48 (46.15%) of the 104 patients were psoriatic, 16 (15.38%) had leprosy, 14 (13.46%) had scleroderma, 12 (11.53%) had SLE, and 4 (3.84%) each had dermatomyositis and Behcet's disease. Each of the following conditions was only once: multicentric reticulohistiocytosis, gout, and Crohn's disease. Our research group did not have any joint indications of other skin illnesses such as acne, rheumatoid arthritis, reactive arthritis, vasculitis syndromes, etc. There isn't a single research that takes into account all skin disorders with arthropathy that we could find to compare the findings of with ours. 36 out of 24,75% of the patients had only limited skin involvement (<30%), and the majority of them had chronic plaque psoriasis. This is a statistically significant number of patients[6-8].

Only a tiny fraction of patients have extensive participation (> 60% involvement in 4 out of 48 patients, or 8.33%). There is debate over whether the frequency of PSAs increases with the extent of skin lesions, however there are an increasing number of studies that refute this, including ones from India. The group with 30–60% skin involvement had the largest average number of affected joints (10.75 joints) per patient. In individuals whose skin involvement was less than 30% of their body surface area, the total number of implicated joints was very significant. Less than 30% of BSA may have been engaged in the largest number of patients (75%) in this instance[9-11].

There is no research that we could discover that discussed how many joints corresponded with the proportion of skin involvement. The highest percentage of patients (33.33%) with oligoarticular type PSA were among the 42 individuals with chronic plaque type psoriasis. Axial and RA-like arthropathies were the next most common types of arthropathies in patients with persistent plaque psoriasis (28.57% each). Patients with erythrodermic psoriasis showed DIP predominate arthropathy, while patients with palmoplantar and generalized pustular psoriasis type patients experienced RA-like arthropathy. There has never been a prior description of a correlation between the kind of psoriasis and the type of joint involvement. As a result, no studies are available for contrast. Six (50%) and four (33%) of the twelve SLE arthropathy patients had non-deforming arthropathy, respectively.

The erosive and nondeforming type had an average of 5.5 more joints involved than the mildly deforming type (1). In their SLE cohort, R M van Vugt et al. found that moderate deforming arthritis (6 of 17, 35.29%) was the most common, followed by Jaccoud's arthropathy (8 of 17, 47%). There were no cases of Jaccoud's arthropathy that we came across. There is no research that discusses the typical number of joints affected. All patients met the ACR criteria, which included photosensitivity, oral ulcers, hematological abnormalities, and ANA positive; however, 10 out of 12 individuals developed malar rash. Serositis (4 of 12) and discoid rash (0 of 12) were found to be least linked with SLE arthropathy among the ACR criteria[12,13].

Because of the small number of patients seen, it was not possible to remark on their precise link with each form of arthritis. Renal dysfunction was the only ACR criterion that R M van Vugt et al. found to be considerably lower in their SLE cohort, and fetal loss was significantly higher in patients with SLE arthropathy. In a similar vein, Thelma L. Skare et al. showed that renal involvement was noticeably lower in their Jaccoud's arthropathy group than in other SLE patients. However, 8 of the 12 individuals in our research had impaired kidney function. In our research group, of the 16 leprosy patients presenting with arthritis, 12 (75%) had borderline illness (BT and BL), and 4 (25%) had lepromatous leprosy.

CONCLUSION

Psoriatic arthropathy was the most prevalent joint alteration linked to cutaneous disorders, affecting 46.15% of patients. Leprosy arthritic patients (15.38%), Sclerodema arthritis

(13.45%), and SLE patients (11.53%) followed. Nevertheless, no research has been done on the frequency of lepra responses linked to arthritis or the relationship between the type of arthropathy and the leprosy type. The most frequent manifestations of scleroderma with arthritis in our research group included fingertip ulcers, Raynod's phenomenon (RP), and cutaneous sclerosis. Gastrointestinal problems were more common among systemic symptoms. There is no research that we could locate that specifically documented the relationship between arthritic pattern and other scleroderma systemic and cutaneous characteristics.

REFERENCES

1. Goodfield MJD, Jones SK, Veale DJ. The connective tissue diseases. In: Tony Burns T, Breathnach S, Cox N, Griffiths C, editors. Rook's textbook of dermatology. 8th edition, 2010, Vol 3, p. 51.1- 51.138.
2. Pavithran K. Disorder of keratinisation. In: IADVL Textbook and Atlas of Dermatology. 2nd ed. Valia RG. Mumbai: Bhalani Publishing House, 2001, p.820-821.
3. Finzi AF, Gibelli E. Psoriatic Arthritis. Int J Dermatol 1991;30(1):1-7.
4. Moll JMH. The Clinical Spectrum of Psoriatic Arthritis. Clin Ortho and Rel Research 1979; 143:66-75.
5. Ruzicka T. Psoriatic Arthritis. Arch Dermatol 1996;132:215-219
6. Braun-Falco O, Ruzicka T. Psoriatic Arthritis. Int J Dermatol 1994; 33(5):320-322.
7. Loebl DH, Kirby S, Stephenson CR, Cook E, Mealing HG, Bailey JP. Psoriatic Arthritis. JAMA 1979;242: 2447-2451.
8. Kalam A, Bhargava SK, Siddiqui MA, Bhushan B. Psoriatic Arthritis- A Clinico-Radiological Research. Ind J Dermatol 1987;32: 57-62.
9. Chaudhary SPR, Singh T, Kaur I, Suri S, Sehgal S, Kaur S. Clinical Profile Of Psoriatic Arthropathy. Ind J Dermatol Venereol Lepr 1990; 56:200-203.
10. van Vugt RM, Derksen RHWM, Kater L, Bijlsma JWJ. Deforming arthropathy or lupus and rhupus hands in systemic lupus erythematosus. Ann Rheum Dis 1998;57:540–544.
11. Skare TL, de Lima Godoi A, Valéria O, Ferreira Jaccoud. Arthropathy in systemic lupus erythematosus: clinical and serological findings. Rev Assoc Med Bras 2012; 58(4):489-492.
12. Sarkar RN, Phaujdar S, Banerjee S, Siddhanta S, et al. Musculoskeletal involvement in leprosy. Ind J Rheumatol 2011;6(1):20-24.
13. Vengadakrishnan K, Saraswat PK, Mathur PC. A research of rheumatological manifestations of leprosy. Indian J Dermatol Venereol Leprol 2004;70:76-8.