Original Research Article

A study of etiology of various joint changes associated with cutaneous disorders

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Abstract

Background: Dermatology often deals closely with other specialties. Rheumatology is one of the specialty with significant overlap. Whether in the area of inflammatory arthropathies such as rheumatoid and psoriatic arthritis; connective tissue disorders such as systemic lupus erythematosus, scleroderma, or dermatomyositis; infective conditions such as leprosy, skin and joints often go hand in hand. **Aim:** To study of etiology of various joint changes associated with cutaneous disorders. **Material and Methods:** All patients with some skin diseases were screened for musculoskeletal complaints. Detailed history and a complete musculoskeletal and cutaneous examination were done for these selected patients. All patients in the study were subjected to radiological examination of joints. **Results:** Out of 52 patients, 46.15% patients belonged to the Psoriatic Arthropathy (PSA) group, 15.38% belonged to the leprosy arthritic group, 13.45% patients belonged to Sclerodema arthritis and 11.53% patients were encountered with SLE arthropathy. **Conclusion:** The commonest joint change associated with cutaneous disorder was Psoriatic arthropathy in 46.15% patients followed by belonged to the leprosy arthritic (15.38%), Sclerodema arthritis (13.45%) and SLE arthropathy (11.53%).

Keywords: Cutaneous disorders, joint changes, psoriatic arthropathy, arthritis

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INTRODUCTION

Many inflammatory, metabolic and infectious diseases affect the skin and joints. Most of these, such as rheumatoid arthritis and systemic lupus erythematosus, are considered to be rheumatic conditions with secondary skin involvement. However, several primary cutaneous diseases are associated with arthritis and may even present with joint symptoms prior to cutaneous lesions.[1,2]Common skin disorders, such as acne and psoriasis, have well known musculoskeletal manifestations. Other less common conditions, such as dermatomyositis, multicentric reticulohistocytosis, pyoderma gangrenosum, Sweet's syndrome and various cutaneous vasculitides have frequent joint involvement.[2] This study was conducted to study of etiology of various joint changes associated with cutaneous disorders.

MATERIAL AND METHODS

Fifty-two subjects were recruited from the patients attending the outpatient Department of Dermatology, indoor patients of Dermatology, Medicine, Orthopaedics and Paediatrics of a tertiary training hospital. An informed consent was taken to include patients in the study.

Inclusion criteria

- Patients with cutaneous disorders having definite joint involvement
- Complain of joint pain / swelling / deformity for more than one month duration
- Patients willing to undergo relevant investigations wherever necessary

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Exclusion criteria

- Patients with no evidence of arthritic changes
- Joint pathology attributable to other established causes like trauma.
- Patient with radiological evidence of overt osteoarthritis
- Who were not willing to undergo relevant investigations
- Denying consent

All patients with some skin disease attending the Dermatology OPD were screened for musculoskeletal complaints i.e. joint pains of more than one-month duration or chronic deformities. All patients among this group who had arthritis were selected for the study. Patients who complained of joint pains but did not have clinical evidence of arthritis as defined by tenderness, swelling or limitation of movement, were excluded. Detailed history and a complete musculoskeletal and cutaneous examination were done for these selected patients. All patients in the study were subjected to radiological examination of joints. Radiographs were done only for joints with evidence of arthritis, in the form of tenderness, swelling or loss of mobility. The radiographs were interpreted by the radiologist and findings in the individual joints were recorded on the proforma. Patients with overt radiological evidence of other causes of arthritis such as osteoarthritis, trauma were excluded. The diagnosis of skin disease was made on clinical grounds. In cases of doubt, skin biopsy was done and only confirmed cases were included. Statistical analysis was done using descriptive statistics.

RESULTS

Out of these 88 had joint complaints. 36 amongst the 88 had to be excluded from the study due to the following reasons; 22 had arthralgia but no evidence of arthritis, 9 had frank osteoarthritis on radiology and 5 denied informed consent. Thus, 52 patients who fulfilled the inclusion criteria were enrolled in the study.

Table 1: Case wise distribution of study population

Clinical presentation		No of cases	Percentage (%)
Psoriasis		24	46.15
Scleroderma	Diffuse	6	11.53
	Localized	1	1.92
SLE		6	11.53
Dermatomyositis		2	3.84
Gout		1	1.92
Crohn's disease		1	1.92
Behcet's disease		2	3.84
Multicentric reticulohistiocytosis		1	1.92
Leprosy		8	15.38
Total		**52**	**100**

Cases of Psoriatic arthropathy constituted the major group (46.15%) in our study population. Male preponderance (53.84%) was noted in our study population. Maximum number of cases in our study population were clustered in the 5th decade (26.92%).

Psoriatic arthropathy

The total number of DIP joints clinically involved was 31. Limitation of movement was present in 77.41% among these i.e. in 24 joints. Radiological involvement was seen in 83.33% among these i.e. 20 joints. Clinically 20 PIP joints were involved, out of which 80% showed radiological changes. The most common among the large peripheral joints, involved were the ankle followed by knee in 25% and 20.8% of patients respectively. The MCP joints were involved in 33.33% of patients. The DIP and PIP joint involvement was seen in 45.83% and 33.33% respectively. Most common type of arthritis in our study population was RA like (33.33%) followed by oligo-articular type (29.16%).The average time by which skin preceded joint involvement was 6.375 years. Arthropathy occurred after skin lesions of psoriasis in 12.5 % of patients at an average of 3.33 years. The occurrence of skin disease before Arthropathy was found to be significantly more i.e. in 21 out of 24 patients(83.3%).(Chi square=9.3, df=1, P=0.002 Significant).The maximum number of patients in each of the subtypes of arthritis, had only few skin lesions i.e. <30%. The average number of joints affected per patient varied between 4 and 10.75%. A significantly higher number of Psoriatic arthropathy patients had skin involvement less than 30% (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	21	17/4	5.71	7	2	6	0	6
Palmoplantar	1	0/1	4	0	0	1	0	0
Gen. pustular	1	0/1	4	0	0	1	0	0
Erythroderma	1	0/1	4	0	1	0	0	0
Total	**24**	**17/7**		**7**	**3**	**8**	**0**	**6**

Significantly higher number of patients i.e. 21 out of 24 (87.5%) had chronic plaque type of psoriasis (chi square=12.04, df=1, P<0.001 HS). The average number of joints affected in chronic plaque type of psoriasis was 5.71.

SLE arthropathy

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	2	23	5.5
Mild deforming arthropathy	1	18.5	1
Non-deforming arthropathy	3	21	5.5

Out of 6 patients of SLE arthropathy 3 had non-deforming arthropathy whereas 2 had erosive arthropathy. Average number of joints involved were more in erosive and non-deforming type (5.5), as compared to mild deforming type (1).

Table 4: Comparison of ACR Criteria in SLE Arthropathy

ACR criteria	Erosive (n=2)	Mild deforming (n=1)	Non-deforming (n=3)	Total
Malar rash	1/2	1/1	3/3	5
Discoid rash	0/2	0/1	0/3	0
Photosensitivity	2/2	1/1	3/3	6
Oral ulcers	2/2	1/1	3/3	6
Serositis	1/2	0/1	1/3	2
Renal	2/2	0/1	2/3	4
Neuro-psychological	0/2	0/1	3/3	3
Hematological	2/2	1/1	3/3	6
ANA	2/2	1/1	3/3	6
Immunological	2/2	0/1	3/3	5

Amongst the ACR criteria, photosensitivity, oral ulcers, hematological abnormalities and ANA positivity were seen in all of the patients whereas 5 of 6 patients had malar rash. Their exact correlation with individual arthritis type could not be commented upon due to small group of patients observed. Most common radiological abnormality observed in SLE arthropathy was soft tissue swelling i.e. in 20 of 23 joints involved (86.95%) 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	3	40	10.66
Swollen hands and feet syndrome	2	44	7.5
Chronic arthritis	1	45	6
Charcot's arthropathy	2	46	7

The joint changes in leprosy patients of our study group appeared in 4th decade presenting as Acute polyarthritic type in 3 out of 8 patients(37.5%), Swollen hands and feet syndrome and Charcot's arthropathy type in 2(25%) each. The average number of joints involved was maximum (10.66) in acute polyarthritic type.

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

Type of leprosy	Acute polyarthritis (n=3)	Swollen hands and feet syndrome (n=2)	Chronic arthritis (n=1)	Charcot's arthropathy (n=2)	Total
BT	2/3	1/2	0/1	0/2	3
BL	0/3	1/2	1/1	1/2	3
LL	1/3	0/2	0/1	1/2	2

Arthritic manifestations were most commonly seen in both Borderline Tuberculous and Borderline Lepromatous Leprosy (37.5% each). Acute polyarthritic type (2 of 3) and Swollen hands and feet syndrome (1 of 2) occurred more frequently in Tuberculous pole (60%) as compared to lepromatous pole(1 of 3 and 0 of 2 respectively) i.e. 20%. However, Charcot's arthropathy presented more in lepromatous pole (2 of 2).

Scleroderma and arthritis

Out of 8 leprosy patients 2 had features of type 1 reaction and presented with acute polyarthritis whereas 3 had features of type 2 reaction with hands and feet syndrome.

Table 7: Distribution of cases according to type of arthritis

Type of disease	Oligoarticular (%)	Polyarticular (%)	Total (%)
dcSSc	2 (28.57)	4 (57.14)	6 (85.71)
lcSSc	0	1 (14.28)	1 (14.28)
Total	**2 (28.57)**	**5 (71.42)**	**7 (100)**

Most common type of arthritis observed in our study group was polyarticular, seen in 5 of 7 (71.42%) patients. Most of the joints involved were DIP joints (94.8%).

Table 8: Comparison of skin findings with type of arthritis

	Features in SSc	Oligoarticular (n=2)	Polyarticular (n=5)	Total (n=7)
Cutaneous	Cutaneous sclerosis	2/2	5/5	7/7
	Raynaud's Phenomenon	2/2	5/5	7/7
	Finger-tip ulceration/scars	2/2	5/5	7/7
	Restricted mouth opening	2/2	4/5	6/7
	Salt and pepper appearance	2/2	4/5	6/7
	Finger tip resorption	1/2	5/5	6/7
	Diffuse Hyperpigmentation	1/2	3/5	4/7
	Finger contractures	2/2	5/5	7/7
	Nail changes	1/2	3/5	4/7
	Ulceration at bony prominences	2/2	5/5	7/7
	Gangrene of fingers	1/2	0/5	1/7
	Calcinosis cutis	0/2	1/5	1/7
Systemic	Gastrointestinal	2/2	5/5	7/7
	Respiratory system	1/2	2/5	3/7
	Renal system	0/2	0/5	0/5
	Aneamia	2/2	2/5	4/5

Most common presenting features in scleroderma with arthritis were cutaneous sclerosis, RP, finger tip ulceration and ulcerations at bony prominences. Among systemic manifestations gastrointestinal abnormalities were more frequently seen.

Dermatomyositis and arthritis

We encountered 2 cases of dermatomyositis having arthritis. Both were males with age at presentation 45 years and 52 years. The onset of arthritis is preceeded by clinical diagnosis of disease by 1 year and 6 months respectively. The total number of joints involved were 3 and 4 respectively (average 3.5). Both heliotrope rash and Gottron's sign were seen in both patients whereas Shawl sign and V sign were present only in first patient. Morning stiffness was seen in both. Both patients presented with pauci-articular type of arthritis mainly involving large joints like wrists and ankles. No patient had any systemic manifestations. Radiologically both patients had only soft tissue swelling without any erosive changes.

Behcet's disease and arthritis:

Two of the arthritic cases belonged to Behcet's disease, one male and female with age 28 years and 25 years respectively (average age at presentation being 24.5 years). Both presented with joint disease a year later after diagnosis of the disease. Total number of joints involved were 4 in each patient.

Both patients had recurrent oral and genital ulcers. First patient had EM like skin lesions and positive pathergy test in addition whereas 2nd patient had bilateral conjunctivitis. Both presented with oligoarticular type of arthritis affecting large joints like wrists and knees.

Radiography showed soft tissue swelling though one of the joint in 1st patient had frank erosive changes.

Gout and arthritis

We also presented with a 43 year-old female case of tophaceous gout with onset of skin disease in the form of tophi over both ankles and feet at the age of 35 years with onset of joint disease since 1 year. She had a history of morning stiffness. Both ankles and tarsal joints were involved with joint effusion in both and erosive changes in rt ankle joint. Systemically she was unremarkable.

Multicentric reticulohistiocytosis

A 50 year old male presented with severe debilitating joint pains involving with restricted mobility of metacarpophalangeal, proximal and distal interphalangeal, knee, elbow and shoulder joints with flexion deformity of bilateral distal interphalangeal joints of 8 months duration and grouped, firm, reddish brown, non-tender papules and nodules over arms, lower abdomen, back, buttocks and bilateral knees and feet 4 months later. X-ray hands showed mild osteopenia with flexion deformity of distal interphalangeal joints. Histopathologically, diffuse histiocytic infiltration confirmed the diagnosis to be Multicentric Reticulohistiocytosis.

Crohn's disease and arthritis

A 30 year male known case of Crohn's disease since 3 years presented with recurrent oral aphthe and arthritis of both knees. Arthritic manifestation started 3 months later the onset of oral lesions, 1 year after the disease diagnosis. She complained of morning stiffness and fleeting type of joint pain affecting major joints. Radiography revealed only soft tissue swelling of bilateral knees without joint effusion or erosive changes.

DISCUSSION

Out of 52 patients, 24(46.15%) belonged to psoriatic group, 8 (15.38%) leprosy group, 7(13.46%) scleroderma group, 6 (11.53%) SLE group, 2 (3.84%) each in Dermatomyositis and Behcet's disease group. We encountered only one case each of Gout, Crohn's disease and Multicentric reticulohistiocytosis. Other skin diseases presenting with joint manifestations like Acne, Rheumatoid arthritis, reactive arthritis , Vasculitic syndromes etc were not seen in our study group. We could not encounter any study broadly considering all skin diseases with arthropathy to compare with our study results. A statistically significant number of patients (i.e. 18 out of 24,75%) had only limited skin involvement (<30%) and majority were of chronic plaque type of psoriasis. Extensive involvement is found only in a small percentage of patients(> 60% involvement only in 2 out of 24 patients (8.33%). While controversy exists regarding the increase in frequency of PSA as skin lesions become more extensive,[3-7] the numbers of studies disproving the same are on the rise which include studies from India.[8,9]The average number of joints involved per patients was highest for the group with skin involvement 30-60% (10.75 joints). The total number of joints involved was quite high in patients with skin involvement of less than 30% body surface area. This could have been because the maximum number of patients (75%) had less than 30% of BSA involved. We could not find any study commenting on number of joints correlating with percentage of skin involvement. Out of the 21 patients with chronic plaque type of psoriasis, maximum number of patients had oligoarticular type of PSA (33.33%). The next most frequent type of arthropathy among patients with chronic plaque psoriasis was the RA like and Axial type (28.57% each). Both palmoplantar and generalised pustular psoriasis type patient had RA like arthropathy whereas erythrodermic psoriasis patient had DIP predominant arthropathy. Correlation of type of joint involvement with type of psoriasis has not been described previously. Hence, there are no studies available for comparison. Out of 6 patients of SLE arthropathy 3(50%) had non-deforming arthropathy whereas 2(33%) had erosive arthropathy. Average number of joints involved were more in erosive and nondeforming type (5.5) as compared to mild deforming type (1). R M van Vugt *et al*,[10] in their SLE cohort reported Jaccoud's arthropathy to be commonest (8 of 17, 47%), followed by mild deforming arthritis (6 of 17, 35.29%). We did not encounter any case of Jaccoud's arthropathy. No study mentions about average number of joints involved.Amongst the ACR criteria photosensitivity, oral ulcers, hematological abnormalities and ANA positivity were seen in all of the patients whereas 5 of 6 patients had malar rash. Among the ACR criteria Discoid rash (0 of 6) and serositis (2 of 6) were found to be least associated with SLE arthropathy. Their exact correlation with individual arthritis type could not be commented on due to small group of patients observed. R M van Vugt *et al*,[10] in their SLE cohort found Renal disorder as the only ACR criterion significantly lower and fetal loss significantly higher in patients with SLE arthropathy. Similarly, Thelma L. Skare *et al*,[11] in their Jaccoud's arthropathy group demonstrated that kidney involvement was significantly low compared to other SLE patients. However in our study, 4 out of 6 patients demonstrated renal abnormality.6 out of 8 (75%) leprosy patients presenting with arthritis in our study group had borderline disease (BT and BL) followed by lepromatous leprosy (2 of 8, 25%). Thus, arthritic manifestations were most commonly seen in both Borderline Tuberculous and Borderline Lepromatous Leprosy (37.5% each). Acute polyarthritic type (2 of 3) and Swollen hands and feet

syndrome(1 of 2) occurred more frequently in Tuberculoid pole (60%) as compared to lepromatous pole (1 of 3 and 0 of 2 respectively) i.e. 20%. However, Charcot's arthropathy was found to present only in lepromatous pole (2 of 2).Out of 8 leprosy patients, 2 (25%) had features of Type 1 reaction and presented with acute polyarthritis whereas 3 (37.5%) had features of Type 2 reaction with hands and feet syndrome. In Sarkar *et al*[12] study group the most common type of leprosy was the tuberculoid (TT, i.e. polar tuberculoid and BT, i.e. borderline tuberculoid) variety comprising 47 patients (46.07%). Other varieties in decreasing order were borderline (BB, i.e. mid-borderline and BL, i.e. borderline lepromatous) with 38 (37.25%) patients, lepromatous (LL, i.e. polar lepromatous) with 10 (9.8%) patients, indeterrminate with six (5.88%) cases, and pure neuritic type with only single case (0.98%). However, the above mentioned study did not correlate type of arthritis with type of leprosy. Vengadakrishnan *et al*[13] in their study found arthritic manifestations to be common in patients with borderline lepromatous leprosy (27%), followed by those with tuberculoid leprosy (13%). The incidence of arthritis in lepra reactions was 57%. Thus, both study results are consistent with our study regarding type of leprosy presenting with arthropathy. However, no study mentions about incidence of lepra reactions associated with arthritis and correlation of type of arthropathy with type of leprosy. In our study group most common features manifesting in scleroderma with arthritis were cutaneous sclerosis, Raynod's phenomenon (RP), finger tip ulceration. Among systemic manifestations, gastrointestinal abnormalities were more frequently seen. We were unable to find any study documenting exact correlation between arthritic pattern and other cutaneous and systemic features of scleroderma.

CONCLUSION

The commonest joint change associated with cutaneous disorder was Psoriatic arthropathy in 46.15% patients followed by belonged to the leprosy arthritic (15.38%), Sclerodema arthritis (13.45%) and SLE arthropathy (11.53%).

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