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Original Research Article

Clinical and Epidemiological Study of 20 Cases of Systemic Sclerosis from South India

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ABSTRACT

Aim: To study the epidemiological features, skin and systemic manifestations of Systemic sclerosis in a group of patients from South India and compare it with previous studies.
Method: All the patients attending the outpatient department of Dermatology were screened during the study period of 2 years (September 2012 - August 2014) and patients satisfying the ACR criteria for Systemic sclerosis were enrolled in the study.
Results: The female to male ratio was 5.7:1. Ninety five percent of cases were in the age group 21 - 60 years, the youngest being 10 years old and the oldest 53 years. Occupational exposure to silica, solvents, pesticides and fireworks were present in 11 cases. Mean duration of illness was 3.3 years. Mean Modified Rodnan score was 18. Skin manifestation noted were sclerodactyly 100 %, difficulty in retracting the lower eyelid 100%, pinched nose 70%, fish mouth appearance 70%, difficulty in opening the mouth 90 %, Raynaud's phenomenon 65 %, digital stellate scars 90%, round finger pad sign 85%, gangrene 10%, salt and pepper pigmentation 95%, generalized hyperpigmentation 45%, neck sign 80%. Investigations revealed anaemia in 25% elevated ESR in 70% and oesophagitis in 45%. Barium swallow studies showed dysmotility in 5% and narrowing of thoracic oesophagus in 5%. HRCT showed ILD in 95% and pulmonary arterial hypertension in 5%. X ray of hands showed acral osteolysis in 75% cases and osteopenia in 25% cases. No patient had renal involvement.
Conclusion: Systemic sclerosis follows almost the same clinical pattern as shown in previous studies. Raynaud's phenomenon was less common and pigmentary changes were more common. Renal involvement was not seen. More than half of the patients had exposure to harmful environmental factors.

Key words: Systemic sclerosis; clinical features; epidemiology; laboratory investigations; systemic manifestations.

INTRODUCTION

Systemic sclerosis is a rare multisystem connective tissue disorder affecting the skin and internal organs. It is characterized by dermal sclerosis, atrophy, vascular abnormalities and autoantibodies. It is broadly classified into two groups; limited and diffuse cutaneous systemic sclerosis based on the extent of skin involvement and systemic associations. [1] Systemic involvement includes interstitial lung disease, pulmonary arterial hypertension, cardiac involvement, dysphagia, gastroesophageal reflux, gastrointestinal involvement, renal failure, malignant hypertension, muscle weakness, joint pain, bone involvement and calcinosis. Diagnosis is made clinically and

investigations are carried out to evaluate the systemic involvement. Even though many studies have been conducted across the globe and in India, there is a paucity of studies from South India and hence we studied the epidemiological features, skin and systemic manifestations of systemic sclerosis in a group of patients from South India and compared them with previous studies.

MATERIALS AND METHODS

All the patients attending the outpatient department of Dermatology were screened during the study period of 2 years (June 2012 - May 2014) and patients satisfying the ACR criteria for Systemic sclerosis were enrolled in the study. American College of Rheumatology (ACR, formerly American Rheumatism Association) Subcommittee for Scleroderma has established the diagnostic criteria for Systemic Sclerosis, according to which patient should have one major criterion or two out of three minor criteria. Major criterion - Proximal scleroderma: Symmetric thickening, tightening, and induration of the skin of the fingers and the skin proximal to the metacarpophalangeal or metatarsophalangeal joints, affecting limbs, face, neck or trunk. Minor criteria - Sclerodactyly, Digital pitting scars, Bibasilar pulmonary fibrosis.

After getting their informed consent, a detailed history was taken and a thorough dermatological and systemic examination was done.

The parameters studied were the age of onset, duration of disease, sex ratio, occupation, duration of exposure to harmful environmental factors, presenting complaint, extent of skin involvement, presence of sclerodactyly, fingertip ulcer, stellate scars, gangrene, digit loss, scleroderma facies, Raynaud's phenomenon, neck sign, round finger pad sign, calcinosis cutis, pigmentary changes, nail involvement, loss of hair in the extremities, hypohidrosis, leg ulcer and associated skin diseases. Systemic involvement was evaluated clinically and investigations including complete blood count, ESR, renal function tests, blood sugar, liver function tests, urine routine were done for all the cases. X-ray chest PA view, HRCT - chest, Pulmonary function test, ultrasound of abdomen and pelvis, ECG, ECHO, Barium Swallow, upper GI scopy, X ray of both hands were done for all the cases. In selected cases EMG, muscle biopsy, skin biopsy, DIF, ANA, Scl 70, U1RNP, and dsDNA were done. The data were compiled and inferences were drawn.

RESULTS

Table 1: Skin manifestations of systemic sclerosis

Skin change	Number of patients	Percentage
Sclerodactyly	20	100
Raynaud's phenomenon	13	65
Fingertip ulcer / scar	18	80
Gangrene / loss of digits	2	10
Round finger pad sign	17	85
Difficulty in mouth opening	18	90
Difficulty in retraction of lower eyelid	20	100
Pinched nose	14	70
Radial furrow/fish mouth	14	70
Telangiectasia	1	5
Diffuse pigmentation	9	45
Salt and pepper pigmentation	19	95
Neck sign	16	80
Loss of hair - extremities	10	50
Hypohidrosis	13	65
Calcinosis cutis	2	10
Leg ulcer	1	5
Ragged cuticle	11	55
Racquet nail	2	10
Blister	1	5

Table 2: Systemic manifestations

Clinical feature	Number of patients	Percentage
Dyspnoea	15	75
Dry cough	7	35
Retrosternal pain/ regurgitation	17	85
Dysphagia	8	40
Altered bowel habits	3	15
Arthralgia	9	45
Myalgia	9	45
Chest pain	1	5

Table 3: Laboratory profile

Laboratory profile	Number of patients	Percentage
Anaemia	5	25
Elevated ESR	14	70
Proteinuria	0	0
HRCT* - chest changes	19	95
Abnormal pulmonary function test	19	95
ECG changes	1	5
ECHO - pulmonary arterial hypertension	1	5
Barium swallow changes	2	10
UGI scopy **	9	45
X ray of hands - acral osteolysis	15	75
X ray of hands - osteopenia	5	25

*HRCT - high resolution computed tomography
** UGI - upper gastrointestinal scopy

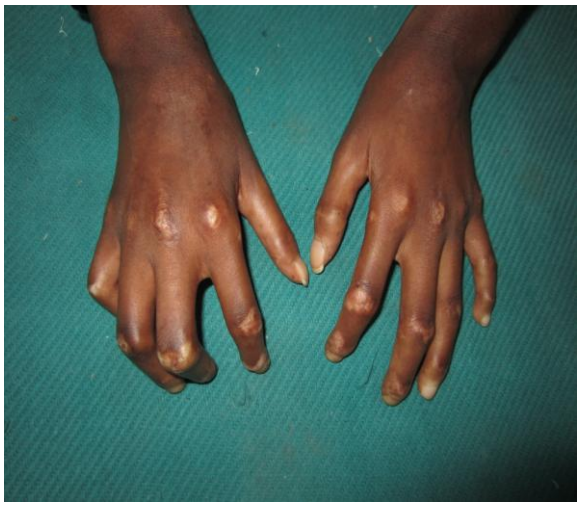

Figure 1: Sclerodactyly

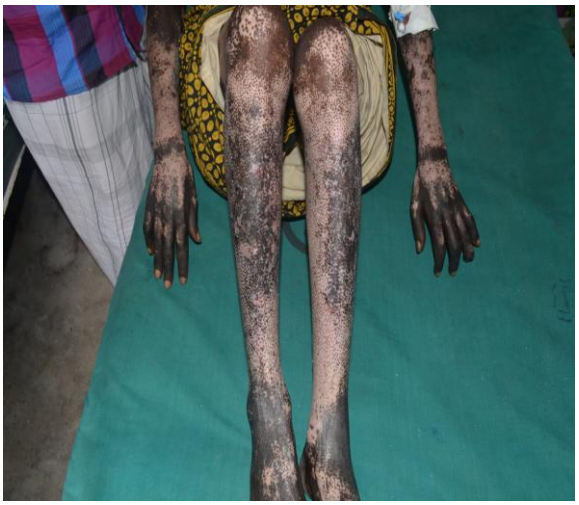

Figure 3: salt and pepper pigmentation

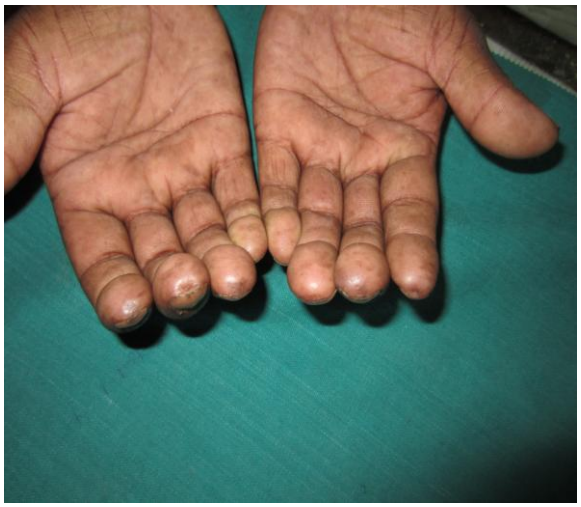

Figure 2: stellate digital scars

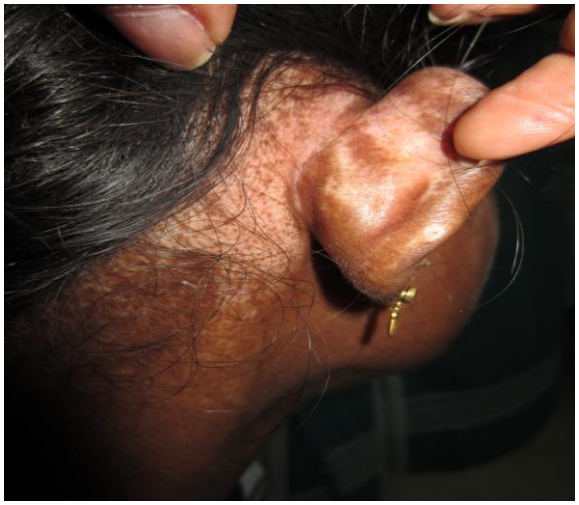

Figure 4: salt and pepper pigmentation - retroauricular area

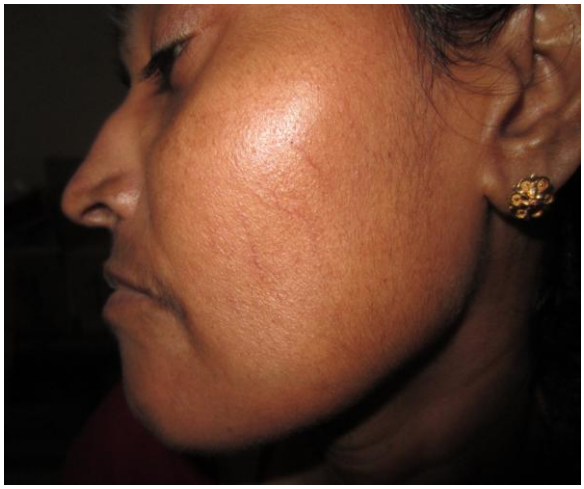

Figure 5: Telangiectasia

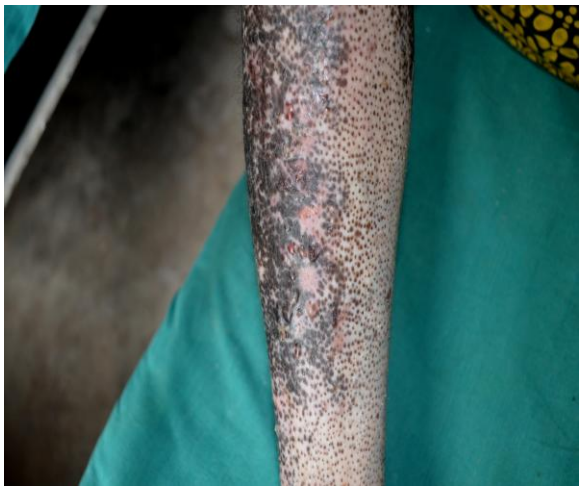

Figure 6: vesicles and bulla in lower limb

A total of 20 patients (3 males and 17 females; male female ratio - 1: 5.6) of systemic sclerosis were studied. Age of the patients varied between 10 and 53 years with mean age of 36 years. Duration of illness was between 4 months and 8 years with mean duration of 3.3 years. Exposure to harmful environmental factors was seen in 11 (55%) patients. The most common presenting complaint was tightness of skin in 7 patients (35%) followed by pigmentary changes in 4 patients (20%), fingertip ulcers in 3 patients (15%), Raynaud's phenomenon in 2 patients (10%). Modified Rodnan Skin Score was measured at 17 sites. Minimum score was 13 and maximum was 37. Mean score was 18.

Clinical features and laboratory evaluation were summarized in tables 1, 2 and 3.clinical pictures are shown in figures 1 - 6.

One patient had multiple, tense vesicles of both upper and lower limb (figure 6), associated with intense itching. Oral erosions were present. Nikolsky - negative, Bulla spreading sign - positive. Tzanck smear showed only eosinophils. Biopsy showed increased collagenization of the dermis, subepidermal bulla. DIF showed linear and granular deposits of IgG, IgM, IgA, fibrin, C3 along basal layer. Salt split technique showed IgA and C3 along the dermal side of the split. ANA was positive, Scl 70 was positive and dsDNA was negative. The patient did not fulfill the ARA criteria for SLE. All these features were suggestive of Epidermolysis bullosa Acquisita.

Barium swallow showed dysmotility in 1 patient and narrowing of thoracic oesophagus in 1 patient. No patient had severe hypertension or renal crisis.

DISCUSSION

In our study the male to female ratio was 1: 5.7, this is similar to the previous studies done in North India by Sharma VK et al [2] (1:5.2), in Australia by Roberts-Thomson et al [3] (1:5) and in Afro Caribbean population by Flower et al [4] (1: 4.6). The youngest patient in our study was of age 10 years and the maximum age reported was 53 years. 95% of patients were in the age group of 21- 60 years. Similarly Ghosh et al, [5] in Eastern India found that 85 % of patients were in the age group 21-60 years. In our study, the mean age of onset was 36 years. This is comparable with the previous studies done in north India by Sharma VK et al [2] (32.75 years), in Eastern India by Ghosh et al [5] (29.6 years).

Exposure to harmful environmental factors was seen in 11(55 %) patients - pesticides in 4 (20%), solvents in 3 (15%), fireworks in 3 (15%), silica in 1 (5%). Diot, Lesire, Guilmot, et al [6] in their case control study had shown significant association with occupational risk factors like silica, solvents, epoxy resins.

Although all patients had skin tightness at presentation it was of concern to

only 35%. Pigmentary changes were present in 95%. Duration of illness varied between 4 months to 8 yrs and the mean duration of illness was 3.3 years. The duration was 6.75 years and 23 months in the studies done by Sharma VK et al [2] and Ghosh et al [5] respectively.

Raynaud's phenomenon was found in more number of patients in studies done by Sharma et al [2] in North India (92.9%) , Ruangjutipopan et al [7] in Thailand (94.1%) and Al Adhadh et al [8] in Saudi Arabia (100%). Low percentage in our study is probably because of higher temperature throughout the year in South India. Fingertip ulcers were present in 58.6%, 53.6% and 47.4% in the studies done by Sharma et al, [2] Ruangjutipopan et al, [7] Krishnamurthy et al [9] respectively. This is comparable to the observation made in our study. Gangrene was present in two cases (10%), this is similar to the study done by Sharma et al [2] (6.7%).

Modified Rodnan skin score varied between 13 and 37, mean score being 18. This is similar to the study done by Reveille JD et al [10] in US where the score was 14 in whites, 15 in Hispanics and 16 in African Americans. But it is low compared to a study done by Sharma et al [2] where the score was 25.81. The variation in the score is due to the difference in the stage in which the patients were examined.

Salt and pepper pigmentation was present in 19 (95%) patients. This is relatively high when compared to studies done by Sharma et al [2] (51.2%) and Ghosh et al [5] (54.3%).

Telangiectasia was present only in one patient (5%) in our study. But higher incidence of telangiectasia have been reported by Flower et al [4] in Afro Caribbean as 48%, Sharma et al [2] in North India as 36.8% and Ghosh et al [5] in East India as 23.1%.

Stellate scars in digits were present noted in 18 (90%) patients, which was a little higher compared to the previous studies done by Ghosh et al [5] (63%) and Flower et al [4] (70%).

Round finger pad sign was present in 17 (85%) patients whereas Mizutani et al [11] described them in 100 % patients. In all 13 patients who had Raynaud's phenomenon, round finger pad sign was present. It was present in 4 cases who did not have Raynaud's phenomenon. These 4 patients had fingertip scars. This could be due to vascular involvement in the absence of or subclinical Raynaud's phenomenon leading to loss of pulp tissue.

Neck sign was positive in 16 (80%) patients. This is similar to the report by Barnett A.J. [12] who initially recorded neck sign in 90%.

X ray of hands showed acral osteolysis in 15 (75%) patients and osteopenia in 5 (25%) patients. Results were comparable to the study done by Sharma VK et al [2] where acral osteolysis was present in 58.3% and osteopenia in 19.4%. Out of the 13 patients who had Raynaud's phenomenon, 11 (84.6%) had acral osteolysis. Out of the 18 patients with fingertip scars, 15 (83.3%) had acral osteolysis. Hence acral osteolysis correlates with Raynaud's phenomenon and fingertip scars.

Anaemia was recorded in 5 (25%) patients and elevated ESR was recorded in 14 (70%) patients in our study. In our study, ESR values did not correlate with the severity of the disease. Elevated ESR was also seen in the studies by Sharma et al [2] (87.8%) and Krishnamurthy et al [9] (70.5%).

All 20 patients had normal liver and renal function test. Urine routine was normal in all patients. No patient in the study had renal involvement. This was the same in the study by Krishnamurthy et al [9] done in South India. Sharma et al [2] recorded proteinuria in only 6% patients. This is strikingly low when compared to western literature where Cannon et al [13] recorded proteinuria in 36%, abnormal RFT in 19% patients. Palma A et al [14] also recorded abnormal parameters in 45% patients.

Interstitial lung disease was present in 19 (95%) patients. This is higher compared to studies done by Sharma et al [2] (65%), Flower et al [4] (30%), Krishnamurthy et al [9] (21.8%). One patient had low voltage QRS complex, on subsequent ECHO cardiogram, no abnormality was found. ECHO showed pulmonary arterial hypertension in one (5%) patient. This is similar to studies done by Flower et al [4] and Reveille JD et al. [10]

Barium swallow study showed dysmotility in one (5%) patient and narrowing of thoracic oesophagus in one (5%) patient. A higher incidence of oesophageal abnormalities have been recorded in studies done by Sharma et al [2] (70.2%) and Reveille JD et al [10] (70%).

CONCLUSION

Systemic sclerosis follows almost the same clinical pattern as shown in previous studies. The following features are highlights of our study. Occupational exposure to harmful environmental factors like silica, solvents, pesticides, heavy metals in fireworks were present in more than half of the cases. Even though skin involvement was present in all cases, 20% of cases present only after systemic involvement. All the patients had diffuse involvement of skin. Only 65% patients had Raynaud's phenomenon, this is probably because of higher temperature present throughout the year in South India. All patients with Raynaud's phenomenon had round finger pad sign. It was also present in 42% patients without Raynaud's phenomenon. Pigmentary change was more common than in previous studies. An interesting case of systemic sclerosis with Epidermolysis Bullosa Acquisita was present. Systemic involvement was seen in most cases, mainly involving the pulmonary and gastrointestinal system. Interstitial lung disease was present in 95% cases. No patient had renal involvement. X ray of hands showed acral osteolysis and osteopenia and this correlated with Raynaud's phenomenon and fingertip scars.

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