Original Research Article

Descriptive Study of the Clinico Etiological Patterns of Stasis Dermatitis in Railway Employees Attending Tertiary Care Hospital

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Abstract

Background: Stasis dermatitis is a common chronic inflammatory disease of skin that occurs on the lower extremities due to chronic venous insufficiency and may be a precursor to various skin changes like eczema, venous ulceration and rarely lipodermatosclerosis. This study was done in exclusively railway workers whose occupation demands prolonged standing/sitting/actively moving to assess the clinico-etiological patterns and evaluate the demographic profile of Stasis dermatitis. **Objective**: To assess Clinico etiological patterns and demographic profile of stasis dermatitis. **Materials and Methods**: This is an Prospective observational study conducted in Tertiary care hospital for duration of six months. First 100 patients attending Dermatology outpatient department of age more than 20years with clinical features of stasis dermatitis are selected for the study. **Results**: Among 100 patients, 79(79%) were male and 21(21%) were female patients with male-to-female ratio of 4: 1 and mean age of incidence was found to be 40 years. The most common risk factor was found to be prolonged standing (76%) and most of the patients had complaints of itching (90%). Perforator vein incompetence was found in 36 % of patients. **Conclusion**: Our study highlights the significant association between venous skin changes and various risk factors. The present study proves the importance of other risk factors like prolonged standing, obesity in producing varicosities, eczematous skin changes. Many patients with chronic venous insufficiency present to dermatology department very late with skin changes of lipodermatosclerosis and venous ulcer. Hence, to identify the high-risk patients at very starting stage is important to avoid disease complications.

Key words: Stasis dermatitis, Lipodermatosclerosis, Chronic venous insufficiency, Eczema.

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Introduction

Stasis dermatitis is a common skin disease of lower limbs which occurs due to chronic venous insufficiency (CVI) of the deep venous system. Patients with chronic venous insufficiency often complains of itching, pain, discomfort and sometimes severe heaviness in the calf of the affected leg. Varicose veins are one of the initial clinical signs of chronic venous insufficiency[1]. Though CVI starts with varicosities, the target organ of CVI is ultimately skin. This is usually present to skin specialist as oozy eczematous, indurated, edematous,pigmented condition around lower legs, foot, ankle (Gaiter area).Eczematous skin changes like redness,scaling,exudation and pruritus are often termed as stasis venous dermatitis. Lipodermatosclerosis is the term used to describe progressive induration, pigmentation and inflammation, was coined by Browse and Bernand[2]. Though it has not been demonstrated that all patients with lipodermatosclerosis have venous insufficiency, most authors agree that lipodermatosclerosis appears to be highly associated with or restricted to the legs of patients with venous insufficiency[3,4]. However, the pathogenic steps that lead from venous insufficiency to lipodermatosclerosis are unknown It usually affects people whose occupation involve prolonged standing and who are actively moving. Stasis eczema usually affects elderly people with multiple etiological factors which are incompletely understood[5]. Thus, this study was undertaken to assess the clinic-etiological patterns and evaluate the demographic profile of stasis dermatitis.

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Materials and methods

The present study is Prospective cross-sectional study done in South Central Railway Hospital, Hyderabad, conducted for duration of six months from March 2021 to August 2021. A total of 100 patients were enrolled for the six-month duration study, and the study was reviewed and approved by the institutional ethical committee. All patients of age more than 20years attending dermatology out patient department with clinical features of stasis dermatitis and who are willing to participate in the study are selected for the study. Sample size is 100, and this was calculated by using the formula 4pq/d2 where p=prevalence, q=100-p, and d=absolute error. Pregnant women, patients below 20years and who are not willing to participate were excluded from the study. Informed consent was obtained from all the patients before data collection.

After taking informed written consent in the patient's own language, complete clinical history was obtained and a thorough clinical examination was done according to the case sheet proforma which is specially prepared for the study so as to arrive at a provisional diagnosis in each case All the subjects were taken thorough clinical history in respect to risk factors and duration, course of disease. Laboratory investigations such as blood sugar, fasting lipid profile, complete hemogram, liver function test, renal function test was done. Skin biopsy was taken and histopathological examination were done wherever required. Colour doppler study of venous system was done to get information about patency of veins as well as the presence or absence of venous reflux of affected limb.

Statistical analysis: The collected data was analysed with statistical package for social sciences software (SPSS) version 22.0 All the findings were tabulated and compared with each other and charts were prepared to arrive at the results. Frequency and mean with standard

deviation (SD) were calculated to express the results in the form of percentages.

Results

The present study comprised of 100patients of stasis dermatitis with different clinical presentations. The most common age group affected was 50-60 years (45 patients, 45%), followed by 60-70 years age group (33 patients, 33%), and more than 70 years (16patients,16%). The mean age of incidence was found to be 40 years. Out of 100patients, 79 (79%) patients were males and 21 (21%) were females. Gender distribution in our study shows male preponderance (79%) with male: female ratio 4:1 (Table 1).

Table 1: **Age and Gender distribution**

Variables	No. of Patients (%)	
Age	21-30 years	0
	31-40 years	2(2%)
	41-50 years	4(4%)
	51-60 years	45(45%)
	61-70 years	33(33%)
	> 70years	16(16%)
	Mean age ± SD	40.63 ± 6.53
Gender	Male	79 (79%)
	Female	21 (21%)

The most common risk factor in our study was found to be prolonged standing seen in 76 patients (76%), followed by BMI> 25 seen in 48 patients (48%), trauma (39 patients, 39 %), Alcohol intake (36 patients, 36%), smoking (32 patients, 32%) as shown in Table 2. Family history is seen in two patients (2%).

Table 2: **Risk factor distribution**

Risk factors	No. of patients (%)
Prolonged standing	76 (76%)
BMI>25	48 (48%)
Smoking	32 (32%)
Alcoholism	36 (36%)
H/o thromboembolism	-
Family history	2 (2%)
Trauma	39 (39%)

The most common symptom found in our study was itching (90 patients, 90%), followed by pigmentary changes (78 patients, 78 %), eczema (63 patients, 63 %), pain/tenderness (46 patients, 46%), edema (30 patients, 30%) (Table 4).

Table 4: **Skin changes**

Symptoms	No: of patients (%)
Itching	90 (90%)
Pigmentary changes	78 (78%)
Eczema	63 (63%)
Edema	30 (30%)
Pain/ tenderness	46 (46%)
Telangiectasia	23 (23%)
Ulcer	12 (12%)
Lipodermatosclerosis	8 (8%)
Cellulitis	22 (22%)

In our study, venous colour doppler findings revealed perforator vein incompetency (36 patients, 36%) was seen more than saphenous vein incompetency (28 patients, 28%) (Table 5).

Table 5: Venous colour doppler findings

Veins	No: of patients (%)
Saphenous veins	28 (28%)
Perforator veins	36 (36%)

Discussion

Age

Stasis dermatitis is usually seen in middle age and the elderly. Prevalence increases as the age advances. In our study, highest prevalence was seen in fifth decade which is in accordance with Shankar S V et al study[6]. In a study done by Sundaresan et al among 4099 patients highest prevalence was shown in patients aged >65 years and the mean age was found to be 74 years (range 50–91)[7]. This is due to chronic venous insufficiency or failure of the lower limb muscle pump in elderly age.

Sex

In our study highest prevalence is seen in males which is probably related to occupation of railway workers. Male to female ratio is 4: 1. Similar observation was seen in Chougule A et al study[8].

Risk factors

Prolonged standing / actively moving is the most common risk factor observed in our study as majority of the railway workers has the occupation which involves field work like gang men, Locopilot etc. This can be attributed to increased venous pressure or hydrostatic pressure and is related to the pressure generated from muscle contraction in the legs and capillary pressure. Impairement of venous valves decreases blood return to heart resulting in venous hypertension and venous stasis.

Increased BMI and metabolic risk factors such as smoking and alcoholism play key role in pathogenesis of microcirculation alteration which leads to development of chronic venous insufficiency[9].

In the study by Gupta and Mushtaq et al, a history of prolonged standing as an aggravating factor was documented in 17 (28.33%) patients and Hypertension was the most common risk factor seen in 35 (58.3%) patients followed by other comorbidities like Diabetes mellitus observed in 19 patients, dyslipidaemia in 17 (28.3%), and thyroid abnormalities in (11.6%) patients[10]. The presence and therefore the number of comorbidities in patients increased with the severity of the disease. Hypertension and Diabetes mellitus were more common in severely affected stasis dermatitis (92.3%) followed by moderately affected (75%) and mildly affected stasis dermatitis (14.2%). In another study done by Sharma and Gupta, majority of the patients (54%) were engaged in occupation involving prolonged standing[11]. Kim et al recorded preceding upper respiratory infection (5.3%), high orthostatic pressure due to prolonged standing (2.6%), and strenuous exercise (2.6%) as the possible etiologic factors[12]. Cho et al found orthostatic HTN (21.6%), exercise (8.1%), and contact with metals (2.7%) as the possible leading causes[13].

Skin changes

Itching and skin pigmentary changes were found in 90% to 78% of subjects respectively. Many patients usually present with itching, varicose veins (Figure 1) and colour changes to skin outpatient clinic. Eczematous changes (Figure 2), edema, ulceration (Figure 3) was found to be next most common skin manifestation.

Fig. 1: Showing varicose veins on lower limb

Fig. 2: Showing pigmentory and eczematous changes

Fig. 3: Showing venous ulcer

Kimball A study showed that palmoplantar eczema occurs most common in middle-aged and elderly men groups and is usually very resistant to management and asteatotic eczema commonly occurs on the shins of elderly patients[14]. Clinically, there are several forms of asteatotic eczema which are either localized or generalized and which have different implications[15]. In a study done by Nath k and Das et al Asteatotic eczema of legs was found to be in seven patients (7%)[16]. In other study done by Iqbal T et al, the incidence of eczema was observed to be 10%[17].

Chronic inflammation produces skin changes because of venous hypertension which is also proposed in fibrin cuff theory where fibrin encases venous capillaries impairs oxygen supply from vasculature into skin cells. In leukocyte trapping hypothesis, white blood cells accumulate in areas of high venous hypertension and many studies also shown increased numbers of T lymphocytes, mast cells, and macrophages in skin of lower limbs of those with chronic venous insufficiency[18].

Many other Studies related to lipodermatosclerosis, which is a cutaneous manifestation of Chronic venous deficiency, found that increased levels of extravasated ferritin and ferric ion may lead to Matrix metalloprotein activation and oxidative stress, which play a role in skin tissue damage. It is possible that something similar may also be occurring in Stasis dermatitis. In addition to hemosiderin deposition, Matrix metalloproteins and many other forms of inflammation may also play a key part in the pathogenesis of increased pigmentation in Stasis dermatitis[19].

Doppler findings

All the subjects were investigated for venous colour doppler study. Of all the subjects 67% of them were found to have incompetent veins either in perforator veins or saphenous veins. Out of them 75% had incompetence in perforator veins and 15% had incompetence in saphenous veins, while 10% had incompetence in both perforator and saphenous veins. These results are in concordance to the Shanker V et al study where 62.5% had perforator incompetence and 32.2 % had saphenous vein incompetence. This is contrary to the observations made by Gupta and Mushtaq et al where Venous insufficiency was not seen in any of the patient.[10] In other study done by Gönül et al venous insufficiency was detected in 75% of the patients on Doppler ultrasonography[20]. Colour Doppler ultrasound allows exact detection of the movement of blood direction, assessment for venous reflux and also any chance of possible obstruction in veins. It is currently the most common technique in use because of its non-invasiveness, accuracy, and cost effectiveness[21]

Conclusion

This study conducted in Railway Employees has found significant association between venous skin changes and various risk factors. Elderly age group along with the occupation which involve long standing/sitting is found to be most common risk factors in the patient. The present study proves the importance of other factors in producing varicosities, eczematous changes.

Many patients with chronic venous insufficiency present to dermatology department very late and the skin changes of lipodermatosclerosis and venous ulcer already present in which the treating physician find it difficult to treat the disease and any management becomes unsuccessful. Hence, to identify the high-risk patients at very starting stage is important and relevant, preventive measures to be started to avoid disease complications.

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