

## Original Article:

# Contributing Factors of Repeated Venous Leg Ulcer: An Observational Study

Fahmida Haque<sup>1</sup>, Towhida Noor<sup>2</sup>

1. East West Medical College, Dhaka.

2. Matador Diagnostic and Wellness Center, Dhaka.

## Abstract

Venous leg ulcer is the most common cause of leg ulcer comprising about 45-60% cases. Chronic venous insufficiency is the ultimate fate of incompetent vein which usually results from previous deep vein thrombosis, congenital or familial valve incompetence, inferior or deep vein obstruction. The objective of this study was to observe the contributing factors of repeated venous leg ulcer in Bangladesh. Fifty-two patients with venous leg ulcer were enrolled. About 80.8% (42 patients out of 52) had history of frequent attack while 19.2% had single attack, about 44.2% patients belong to age range 41-50 years; Male, female ratio was 1.7:1; 55.76% had job with prolong standing, 57.6% were overweight, 30.76% were heavy smoker. Overweight, prolong standing, smoking, all were contributing factors of both primary and repeated attacks of chronic venous ulcer. In conclusion, patients with venous leg ulcers should be advised for quitting smoking, weight reduction and avoiding prolong standing jobs from very beginning to avoid repeated ulcer.

**Keywords:** Venous leg ulcer, overweight, smoking, prolong standing job.

## Introduction

Patients with venous insufficiency invariably develop venous leg ulcers. The predisposing factors of the venous leg ulcers are leg swelling, leg pain, varicosities, stasis dermatitis and or lipodermatosclerosis<sup>1</sup>. There are several risk factors for chronic venous insufficiency which include heredity, overweight, female sex, older age, pregnancy, history of prolong standing or sitting, history of thrombosis, etc<sup>2</sup>. Lower extremity venous thrombosis is clinically silent, so relevant inquiry related to thrombosis should be taken, e.g., family history of similar problem, any episode of leg immobilization including hip or knee surgery or fractures<sup>3</sup>.

The most common cause of venous leg ulcer is insufficiency of the valves in the deep venous system and lower perforating veins of the lower leg. Incompetent valves in the deep and perforating veins result retrograde blood flow to superficial system. Increased flow to the superficial system results in enlargement superficial venous plexus and causes venous hypertension. Localized hypertension leads to leukocyte trapping and activation, resulting in surrounding tissue damage and leakage of fibrinogen, which traps growth factors necessary for tissue repair. If untreated, these conditions lead to the development of venous ulcers<sup>5</sup>.

Venous ulceration is characterized by periods of exacerbation and remission. They often take a long time to heal, which results in physical and psychological discomfort and a significant impact on quality of life<sup>4,6</sup>.

## Materials and Methods

This cross-sectional study was conducted among randomly selected 52 venous leg ulcer patients at the dermatology out patient department of Bangladesh Medical University. Inclusion criteria was, venous leg ulcer patients diagnosed by history & clinical examination, both sexes & all ages. The diagnostic criteria for the ulcer included, its typical location over lower medial aspect of leg, painless or mildly painful, sloping edge, yellow fibrinous base, warm periphery, surrounding skin pigmentation along with history of leg swelling, varicose vein, venous thrombosis, stasis dermatitis and or lipodermatosclerosis. If co-existing arterial insufficiency was suspected, ABI (Ankle Brachial Index) was measured. If it was >0.8, co-existing arterial insufficiency was excluded. Doppler USG of lower limb vessels was also done to confirm the diagnosis. Exclusion criteria were patients with leg ulcers due to other causes, such as arterial ulcer, vasculitis, connective tissue diseases,

### Corresponding author

Dr. Fahmida Haque, Associate Professor (Dermatology & Venereology), East West Medical College, Dhaka. Email: haquetanima@gmail.com

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trauma, malignancy, dermatoses, ABPI<0.8, patients receiving heparin or other anticoagulants at the time of study. The respondents were then divided into two groups; one with first episode of venous ulcer and other with repeated attacks of ulcer. They were then evaluated for body mass index, prolong standing for more than 8 hours in a day, pack year of smoking. Based on pack-years of smoking, patients were classified as never smokers (0.0 pack-years), light smokers (0.1-20.0 pack-years), moderate smokers (20.1-40.0 pack-years), and heavy smokers (> 40 pack-years).

IRB clearance was taken from the university institutional review board and informed written consent was taken from the participants. A structured questionnaire was used for collecting data. Data interpretation was done by SPSS.

### Differential Diagnosis

Table-1 shows the age distribution of the study patients. Age range of the patient was 27 to 65 years. The mean age of the patients was 46.04±9.56 years. Male, female ratio was 1.7:1. The table-2 shows the frequency of attack of venous leg ulcer where majority 80.8% patients had recurrent attack and 19.2% patients had single attack. Table-3 shows BMI status of the study patients, 50% patients with primary leg ulcer and 62.2% patients with repeated leg ulcer were overweight. Chi-square test was done and it was non-significant. In table 4, regarding the occupational status, 40% patients with primary leg ulcer and 62.5% with repeated leg ulcer were job with prolong standing and Chi-square test was found non-significant. Table-5 shows the history of smoking, 15% patients in primary ulcer group were heavy smoker, while 40.6% patients in repeated ulcer group were heavy smoker. Chi-square test also found non-significant here.

**Table-1: Distribution of the study patients by age (n=52)**

Age in years	Number of patients	Percent (%)
<30	6	11.5
31-40	12	23.1
41-50	23	44.2
>50	11	21.2
Mean±SD	46.04±9.56	
Range	(27-65) years	

**Table-2: Distribution of the study subjects by frequency of attack (n=52)**

Frequency of attack	Frequency	Percent (%)
Primary	20	38.46
Repeated	32	61.53
Total	100	100.0

**Table-3: Distribution of the study subjects according to BMI status (n=52)**

BMI (kg/m <sup>2</sup> )	Primary (n=20)	Repeated (n=32)	P value
Normal weight (18.5-23 kg/m <sup>2</sup> )	5 (25%)	7 (21.8%)	0.9479 <sup>ns</sup>
Over weight (23.1-25 kg/m <sup>2</sup> )	10 (50%)	20 (62.5%)	
Obese (> 25 kg/m <sup>2</sup> )	5 (25%)	5 (15.6%)	
Total	20 (100%)	32 (100%)	

ns= not significant

Table 3 shows distribution of study subjects according to BMI. Chi-square test ( $\chi^2$ ) was performed to see the association between primary and repeated venous ulcer patients and was found not significant.

**Table-4: Distribution of the study subjects according to occupational status (n=52)**

Occupational status	Primary (n=20)	Repeated (n=32)	P value
Job with prolong standing	9 (45%)	20 (62.5%)	0.1037 <sup>ns</sup>
Job with prolong sitting	5 (25%)	5 (15.6%)	
Others	6 (30%)	7 (21.8%)	
Total	20 (100%)	32 (100%)	

ns= not significant

Table 4 shows distribution of study subjects according to occupational status. Chi-square test ( $\chi^2$ ) was performed to see the association between primary and repeated venous ulcer patients and was found not significant.

**Table-5: Distribution of the study subjects according to smoking status (n=52)**

History of smoking	Primary (n=20)	Repeated (n=32)	P value
Heavy smokers (> 40 pack-years)	3 (15%)	13 (40.6%)	6.35 <sup>ns</sup>
Moderate smokers (20.1-40.0 pack-years)	5 (25%)	10 (31.25%)	
light smokers (0.1-20.0 pack-years)	5 (25%)	5 (15.62%)	
Never smokers (0.0 pack-years)	4 (20%)	2 (6.25%)	
Ex-smoker	3 (15%)	2 (6.25%)	
Total	20 (100%)	32 (100%)	

ns= not significant

Table 5 shows distribution of study subjects according to smoking status. Chi-square test ( $\chi^2$ ) was performed to see the association between primary and repeated venous ulcer patients and was found not significant.

## Discussion

This cross-sectional observational study was carried out with an aim to study the contributing factors of repeated venous leg ulcer. A total of 52 patients of venous leg ulcers attending at the Dermatology and Venereology department of Bangladesh Medical University, were enrolled & patients with venous leg ulcers were confirmed clinically and by Doppler USG of lower limb vessels. It has been reported that ulcers related to venous insufficiency constitute 70% of leg ulcer presentations. The prevalence of chronic leg ulcer in the community ranges from 1.9% to 13.1%. Estimated prevalence of chronic venous leg ulcer is between 0.1% & 0.3%<sup>7</sup>.

Venous leg ulcer commonly occurs in older age. S.R. Baker (1994) studied with a metropolitan population of 2,30,000 of chronic leg ulcer patients in Perth, Western Australia where 57% was venous leg ulcer patients and 90% of them were of 60 years and older<sup>8</sup>. Rayner et al. (2009) also noted, chronic leg ulcer commonly affects patients aged over 60 years<sup>9</sup>. In our study, among 52 venous leg ulcer patients, 44.2% belong to age group 41-50 years, and 21.2% to >50 years.

Studies have shown that 20-37% of venous leg ulcer has the tendency of repeated ulcer<sup>8</sup>. In present study, out of 52 patients, 80.8% have history of recurrent attack and 19.2% have history of single attack over past one year. Frykberg et al. reported that obesity contributed to the development of venous leg ulcer. In this study, 53.8% of the participants were overweight and 15% were obese<sup>10</sup>. Standing more than eight hours a day is considered prolong standing and there were a number of health risks related to prolong standing, e.g., chronic venous insufficiency, musculoskeletal pain of the lower back and feet, preterm birth, and spontaneous abortions<sup>11</sup>. In this study, 57.1% of the respondents were doing jobs with prolong standing.

Gourgou et al. observed smoking as a contributing factor of chronic venous ulcer<sup>12</sup>. In our study, out of 32 patients with frequent attack, 40.6% were heavy smokers.

Thus smoking, job with prolong standing, overweight or obesity can be considered as important contributing factors of repeated venous leg ulcers.

## Conclusion

From this study we have learned about some modifiable contributing factors of repeated venous leg ulcer which were also present during the primary attack. Avoiding smoking and prolong standing, weight reduction is supposed to reduce the risk of developing repeated leg ulcers.

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