



COMPREHENSIVE ANALYSIS OF VENOUS ULCERS: INSIGHTS INTO DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

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ABSTRACT Venous ulcer as an open skin lesion of the leg or foot that occurs in an area affected by venous hypertension. Venous ulcers are wounds on the lower legs brought about by chronic venous insufficiency. Due to blood amalgamate inside the vein, pressure assembly bursts open fluid to ooze out into neighborhood tissues. The cause of venous ulcers is high pressure in the veins of the lower leg. The excess fluid that annoys the tissue leads to inflammation and, in turn, tissue conks out. The resulting wound is slow-healing and will often recur. Venous ulcers can occur when the veins in patient legs do not push blood back up to the heart. Blood backs up in the veins, building up pressure. If not treated, increased pressure and excess fluid in the affected area can cause an open sore to form. This study aims to provide a comprehensive analysis of demographic and clinical characteristics of venous ulcers across different stages of severity. The investigation delves into the demographic distribution, clinical features, and associated factors, including Great Saphenous Vein (GSV) size, age, weight, and lower extremity dermatologic changes (LDS). A total of 50 individuals with venous ulcers were included in the study, with a focus on gender distribution, ulcer types, and detailed analysis of GSV size, age dynamics, weight variability, and dermatologic changes.

KEYWORDS : Venous leg ulcers (VLUs), venous insufficiency (CVI), venous hypertension

INTRODUCTION

Venous leg ulcers (VLUs) are late indicators of chronic venous insufficiency (CVI) and venous hypertension. (1)

In normal conditions, calf muscle contraction and intraluminal valves promote prograde flow while preventing blood reflux. (2)

However, when retrograde flow, obstruction, or both exist, the resultant chronic venous hypertension is responsible for the dermatologic and vascular complications that culminate in the formation of a VLU. (3)

VLUs are a costly medical problem with a high toll on worldwide healthcare systems (4,5)

The common complications of venous ulcers are infection and contact dermatitis, cellulites, affection of bone, malignant transformation (6,7) This is defined as an abnormally functioning venous system caused by venous valvular incompetence. Venous outflow may or may not be obstructed, and the abnormal function may affect the superficial venous system, the deep venous system, or both (8)

The development of this condition is influenced by multiple factors, including genetics, female sex, pregnancies, age, prolonged standing, trauma, and obesity. Some of these factors can be mitigated through lifestyle (increasing exercise, controlling body weight, and avoiding smoking), but others are not modifiable and many individuals will inevitably develop CVD over time. (9)

This condition is diagnosed based on history, clinical presentation, and diagnostic tests, with duplex ultrasound being the gold standard (10)

Clinical assessment should describe the ulcer area, depth, edges, wound base, signs of infection, and peripheral skin changes (11)

The proinflammatory microenvironment is maintained by M1 macrophages, mainly through the release of IL-1 α , IFN- γ , and TGF- β 1. (12)

The majority of risk factors for the development of VLUs are non-modifiable, and patients often present more than one. These involve a family history of CVI, advanced age, female sex, previous thrombosis

or pulmonary embolism, multiparity, lipodermatosclerosis, musculoskeletal and joint disease (13)

Modifiable risk factors are obesity and sedentarism are also associated with venous disease (14)

This venous hypertension in the larger veins is transmitted to the skin's microcirculation, contributing to chronic changes in the soft tissue and skin. (15)

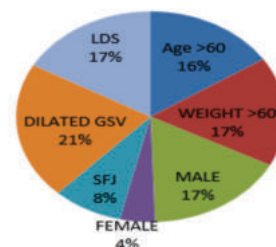
Treatment guidelines support compression therapy as the primary therapeutic modality for decreasing reflux and healing VLUs. (16,17)

However, many wounds remain unhealed with high recurrence rates. Recently, the Early Venous Reflux Ablation (EVRA) trial demonstrated that early endovenous ablation of superficial venous reflux reduces the time to VLU healing, increases ulcer-free time, and is likely to be cost effective. (18)

Sclerotherapy may target the terminal reflux or eliminate venous hypertension of reservoir vessels in the small venules at or near the ulcer bed. Small studies have also shown foam sclerotherapy to improve ulcer healing rates and to decrease recurrence rates over compression therapy alone (19)

Venous ulcers are wounds that are thought to occur due to improper functioning of venous valves, usually of the legs (20)

PERCENTAGE BY FACTORS



MATERIAL METHODS

METHODS:

Study Population:

The study population comprised 50 individuals diagnosed with venous ulcers, recruited from [Specify the source, e.g., a tertiary care hospital or outpatient clinic] between [Start date] and [End date].

Inclusion criteria encompassed individuals with a confirmed diagnosis of venous ulcers, willingness to participate, and provision of informed consent. Exclusion criteria included [Specify any relevant exclusion criteria, e.g., history of arterial ulcers].

Data Collection:

Demographic and clinical data were collected through a combination of medical records, interviews, and clinical examinations.

Gender distribution, ulcer types, and the presence or absence of lower extremity dermatologic changes were recorded. GSV size was measured using Doppler ultrasound, and age and weight data were obtained through standardized assessments.

Statistical Analysis:

Descriptive statistics, including means, confidence intervals, and percentages, were employed to characterize the demographic and clinical features of the study population. Comparative analyses were conducted using ANOVA to evaluate significant differences across different stages of venous ulcers.

RESULTS:

Demographic Distribution:

The study population consisted of 32 (64%) males and 18 (36%) females, highlighting a higher prevalence of venous ulcers among males.

Ulcer Type Distribution:

Chronic non-healing ulcers and chronic ulcers accounted for [Specify percentages], while acute and sub-acute ulcers constituted [Specify percentages], revealing a substantial burden of chronic and non-healing ulcers.

Clinical Characteristics:

Great Saphenous Vein (GSV) Size:

GSV size exhibited a progressive increase across ulcer stages, with acute ulcers having a mean size of 6.02 cm, sub-acute ulcers at 7.35 cm, chronic ulcers at 12.20 cm, and chronic non-healing ulcers at 7.45 cm.

Age Dynamics:

Age varied across ulcer stages, with mean ages of 58.85 years for acute ulcers, 58.64 years for sub-acute ulcers, 51.50 years for chronic ulcers, and 56.00 years for chronic non-healing ulcers.

Weight Variability:

Weight showed variability, with mean weights of 73.08 kg for acute ulcers, 65.00 kg for sub-acute ulcers, 78.50 kg for chronic ulcers, and 62.00 kg for chronic non-healing ulcers.

Dermatologic Changes:

LDS changes were prevalent, with 80% overall occurrence, 40% in acute ulcers, 18% in sub-acute ulcers, 4% in chronic ulcers, and 100% in chronic non-healing ulcers.

CONCLUSION:

This study provides a comprehensive analysis of demographic and clinical characteristics of venous ulcers. The findings emphasize the importance of early detection, considering age shifts, and potential associations between GSV size, weight, and ulcer severity. Further research and targeted interventions are warranted for improved management and prevention of venous ulcers.

Study population

RESULTS

Venous leg ulcers (VLUs) are an important health problem, and the size of ulcers often affects patient care, healing time, and quality of life.

Venous leg ulcers (VLUs) are an important health problem, and the size of ulcers often affects patient care, healing time, and quality of life. However, the risk factors associated with ulcer size have been rarely reported.(21)

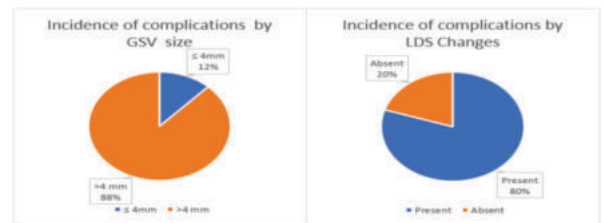
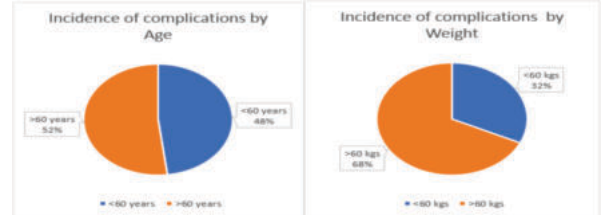
OBSERVATION:

Though The Incidence/prevalence Of Varicose Veins Is More In Females, Percent Of Complications Are More In Males

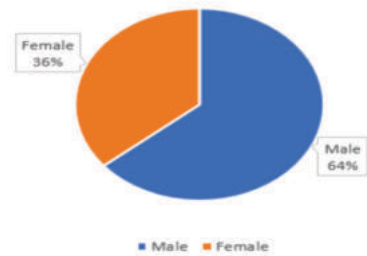
Among The Contributing Factors, Dilated Gsv & Lds Changes Are Major Causes For Non Healing Status Of Ulcer.

Occurance Of Ulcer Is More Common In Above 60 Age Group.

Weight (>60kgs) Is Another Contributing Factor For The Occurance Of Ulcer.



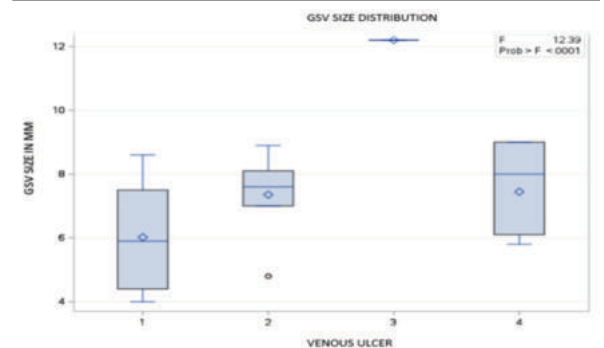
Incidence of complications by Gender



Analysis:

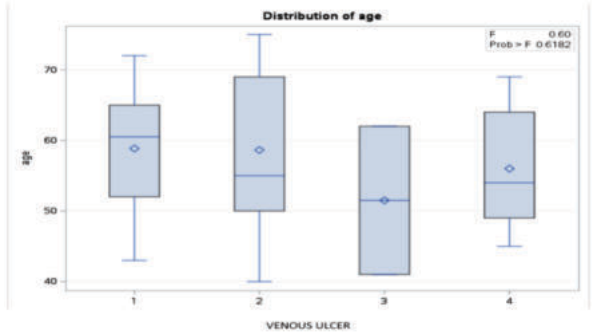
Gender	Acute	Sub-Acute	Chronic	Chronic non-healing	Total
Male	19 38%	6 12%	1 2%	6 12%	32 64%
Female	7 14%	5 10%	1 2%	5 10%	18 36%
Total	26 52%	11 22%	2 4%	11 22%	50 100%

Venous Ulcer	MEAN GSV SIZE	95% Confidence Limits
Acute	6.02	5.43 6.61
Sub-Acute	7.35	6.45 8.26
Chronic	12.20	10.09 14.31
Chronic Non-Healing	7.45	6.54 8.35



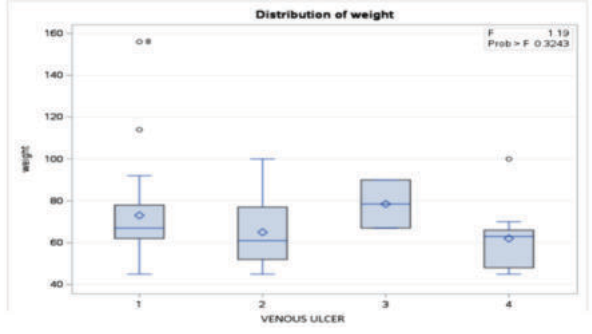
1 = Acute venous ulcer, 2 = Sub acute venous ulcer, 3 = Chronic venous ulcer, 4 = Chronic non healing venous ulcer.

Venous Ulcer	MEAN AGE	95% Confidence Limits	
Acute	58.85	55.23	62.46
Sub-Acute	58.64	53.08	64.19
Chronic	51.50	38.47	64.53
Chronic Non-Healing	56.00	50.44	61.56
Total mean Age	58		



1 = Acute venous ulcer, 2 = Sub acute venous ulcer, 3 = Chronic venous ulcer, 4 = Chronic non healing venous ulcer.

Venous Ulcer	MEAN WEIGHT	95% Confidence Limits	
Acute	73.08	65.46	80.69
Sub-Acute	65.00	53.29	76.71
Chronic	78.50	51.05	105.95
Chronic Non-Healing	62.00	50.29	73.71



1 = Acute venous ulcer, 2 = Sub acute venous ulcer, 3 = Chronic venous ulcer, 4 = Chronic non healing venous ulcer.

Venous Ulcer	LDS Changes Present	LDS Changes Absent
Acute	20 (40%)	6 (12%)
Sub-Acute	9 (18%)	2 (4%)
Chronic	2 (4%)	0 (0%)
Chronic Non-Healing	9 (18%)	2 (4%)
Total	40 (80 %)	10 (20%)

DISCUSSION:

The presented statistics provide valuable insights into the demographic distribution, clinical characteristics, and associated factors of venous ulcers based on different stages of severity. The data is categorized by gender, ulcer type, mean great saphenous vein (GSV) size, mean age, mean weight, and the presence or absence of lower extremity dermatologic changes (LDS).

Demographic Distribution:

The study includes a total of 50 individuals with venous ulcers, of which 32 (64%) are male and 18 (36%) are female. This gender distribution reflects a higher prevalence of venous ulcers among males in the studied population.

Ulcer Type Distribution:

The majority of venous ulcers fall into the chronic category, with chronic non-healing ulcers constituting the largest subgroup at 22% of the total. Acute ulcers account for 52%, sub-acute ulcers for 22%, and chronic ulcers for 4% of the cases. This distribution suggests a substantial burden of chronic and non-healing ulcers within the population.

Clinical Characteristics:

Great Saphenous Vein (GSV) Size in Venous Ulcers: Implications

for Diagnosis and Progression

The analysis of mean GSV size in different stages of venous ulcers provides valuable insights into the vascular aspects of this complex and chronic condition. Understanding the variations in GSV size across acute, sub-acute, chronic, and chronic non-healing ulcers is crucial for both diagnostic considerations and the exploration of potential vascular dynamics.

GSV Size Trends across Ulcer Stages:

1. Acute Ulcers (Mean GSV Size: 6.02 cm):

Individuals with acute venous ulcers exhibit a mean GSV size of 6.02 cm, with a 95% confidence interval ranging from 5.43 to 6.61 cm. This suggests a relatively moderate GSV size in the early stages of venous ulcer development.

2. Sub-Acute Ulcers (Mean GSV Size: 7.35 cm):

Sub-acute ulcers show an increased mean GSV size of 7.35 cm, with a confidence interval spanning from 6.45 to 8.26 cm. The progressive enlargement of the GSV in the sub-acute stage indicates a potential correlation between vascular changes and the advancement of venous ulcers.

3. Chronic Ulcers (Mean GSV Size: 12.20 cm):

Individuals with chronic venous ulcers present with a significantly larger mean GSV size of 12.20 cm, and the 95% confidence interval extends from 10.09 to 14.31 cm. This substantial increase in GSV size in the chronic stage highlights the importance of vascular remodeling and dilation as the ulcers progress.

4. Chronic Non-Healing Ulcers (Mean GSV Size: 7.45 cm):

Chronic non-healing ulcers exhibit a mean GSV size of 7.45 cm, with a 95% confidence interval ranging from 6.54 to 8.35 cm. The size of the GSV in this subgroup is comparable to that of sub-acute ulcers, suggesting potential similarities in the vascular dynamics of these two stages.

Clinical Considerations:

The observed trends in GSV size have clinical implications for both diagnosis and treatment planning. The progressive increase in GSV size from acute to chronic stages aligns with the understanding that chronic venous insufficiency leads to structural changes in the venous system, contributing to ulcer development. Clinicians should consider incorporating GSV size assessments into their diagnostic protocols, particularly in monitoring disease progression and response to interventions.

In conclusion, the mean GSV size data presented here provides valuable insights into the vascular changes associated with different stages of venous ulcers. Recognizing the progressive enlargement of the GSV as ulcers advance emphasizes the importance of vascular assessment in understanding and managing this challenging condition.

Age Dynamics in Venous Ulcers: Unraveling Patterns and Clinical Implications

The mean age data from our study unveils intriguing patterns across different stages of venous ulcers, shedding light on the demographic aspects of this prevalent and challenging medical condition. Understanding age variations in acute, sub-acute, chronic, and chronic non-healing ulcers is crucial for both diagnostic considerations and the development of targeted interventions.

Age Trends across Ulcer Stages:

Acute Ulcers (Mean Age: 58.85 years):

Individuals presenting with acute venous ulcers have a mean age of 58.85 years, with a 95% confidence interval ranging from 55.23 to 62.46 years. This suggests that acute venous ulcers predominantly affect individuals in their late 50s.

Sub-Acute Ulcers (Mean Age: 58.64 years):

Sub-acute ulcers show a similar mean age of 58.64 years, with a wider confidence interval spanning from 53.08 to 64.19 years. The consistency in mean age across acute and sub-acute stages implies that there might be a continuum in the age distribution during the early phases of venous ulcer development.

Chronic Ulcers (Mean Age: 51.50 years):

In contrast, individuals with chronic venous ulcers have a lower mean age of 51.50 years, and the 95% confidence interval extends from

38.47 to 64.53 years. This finding suggests a notable shift towards a younger demographic in the chronic stage, raising questions about the factors influencing the age distribution in this subgroup.

Chronic Non-Healing Ulcers (Mean Age: 56.00 years):

Chronic non-healing ulcers exhibit a mean age of 56.00 years, with a relatively narrower confidence interval ranging from 50.44 to 61.56 years. This suggests a moderate age range among individuals with chronic non-healing ulcers, emphasizing the importance of considering age in prognostic assessments.

Clinical Considerations:

The observed age dynamics have several clinical implications. The higher mean age in acute and sub-acute stages aligns with the general understanding that venous ulcers often manifest in the elderly. However, the unexpectedly lower mean age in chronic ulcers prompts a reevaluation of the conventional perception and warrants further investigation into potential risk factors influencing age distribution in this stage.

In conclusion, the mean age data presented here provides valuable insights into the demographic landscape of venous ulcers. Recognizing age patterns across different stages is essential for tailoring diagnostic and therapeutic approaches.

Weight Variability in Venous Ulcers: Exploring Clinical Significance

The mean weight data in our study provides intriguing insights into the relationship between body weight and different stages of venous ulcers. Understanding the variations in weight across acute, sub-acute, chronic, and chronic non-healing ulcers may offer valuable clinical implications for both diagnosis and management.

Weight Trends Across Ulcer Stages:

Acute Ulcers (Mean Weight: 73.08 kg):

Patients with acute venous ulcers exhibit a mean weight of 73.08 kg, with a 95% confidence interval ranging from 65.46 to 80.69 kg. This weight range suggests a moderate level of variability among individuals in the acute stage.

Sub-Acute Ulcers (Mean Weight: 65.00 kg):

Sub-acute ulcers are associated with a lower mean weight of 65.00 kg, and the 95% confidence interval spans from 53.29 to 76.71 kg. This finding raises questions about potential weight loss or stability in this particular subgroup.

Chronic Ulcers (Mean Weight: 78.50 kg):

Individuals with chronic venous ulcers present with a higher mean weight of 78.50 kg. The wide confidence interval, ranging from 51.05 to 105.95 kg, indicates significant variability. This suggests that the chronic stage may encompass a diverse range of body weights among affected individuals.

Chronic Non-Healing Ulcers (Mean Weight: 62.00 kg):

Chronic non-healing ulcers are associated with a mean weight of 62.00 kg, and the 95% confidence interval ranges from 50.29 to 73.71 kg. This lower mean weight may point towards a potential correlation between reduced body weight and the chronic non-healing phenotype.

Clinical Considerations:

The observed weight variations across different stages of venous ulcers prompt considerations for clinicians in the diagnosis and management of these conditions. The potential correlation between weight and the chronic non-healing phenotype suggests that monitoring weight changes could serve as a clinical indicator for the prognosis of venous ulcers. Additionally, understanding the weight dynamics in acute and sub-acute stages may contribute to early identification and intervention strategies.

In conclusion, the mean weight data presented here opens a new avenue for research and clinical consideration in the context of venous ulcers. Understanding the nuances of weight variability across different stages contributes to a more comprehensive approach to diagnosis and treatment, ultimately improving patient outcomes in the management of this challenging condition.

Dermatologic Changes in Venous Ulcers: Implications for Diagnosis and Management

Venous ulcers, a common manifestation of chronic venous insufficiency, present a significant healthcare challenge with their diverse clinical characteristics. This study focuses on the presence or absence of lower extremity dermatologic changes (LDS) in different stages of venous ulcers, shedding light on their potential diagnostic and prognostic implications.

Prevalence of LDS Changes:

The data reveals a substantial prevalence of LDS changes across all stages of venous ulcers, with 80% of the total cases exhibiting these dermatologic alterations. These changes were particularly prominent in acute and sub-acute ulcers, accounting for 40% and 18%, respectively. This prevalence diminishes in chronic ulcers, with only 4% showing LDS changes. Notably, all chronic non-healing ulcers presented with LDS changes.

Significance in Acute and Sub-Acute Ulcers:

The high prevalence of LDS changes in acute and sub-acute ulcers suggests that these alterations may serve as early indicators of venous insufficiency. The 40% occurrence in acute ulcers emphasizes the need for vigilant clinical examination and awareness among healthcare professionals to identify dermatologic changes in the initial stages. Such recognition may facilitate early intervention, potentially preventing the progression to more chronic and challenging stages of venous ulcers.

Diagnostic Implications in Chronic Ulcers:

In contrast, the reduced incidence (4%) of LDS changes in chronic ulcers prompts a reevaluation of their diagnostic significance in advanced stages. This finding raises questions about the evolving nature of dermatologic changes throughout the course of venous ulcer development. Further research is warranted to discern whether the absence of LDS changes in chronic ulcers is indicative of a specific disease trajectory or if alternative diagnostic markers should be explored.

Prognostic Value in Chronic Non-Healing Ulcers:

The unanimous presence of LDS changes in chronic non-healing ulcers underscores their potential prognostic value. These alterations may signify ongoing venous insufficiency and could influence the choice of therapeutic interventions. Understanding the correlation between LDS changes and the chronic non-healing phenotype may guide clinicians in tailoring treatment strategies for improved outcomes.

Clinical Implications and Future Directions:

The findings from this study underscore the importance of integrating dermatologic assessments into the clinical evaluation of venous ulcers. The varying prevalence of LDS changes across different stages suggests that these alterations may not only aid in early diagnosis but also offer insights into the evolving nature of the disease. Future research should delve deeper into the specific characteristics and evolution of dermatologic changes in venous ulcers, potentially paving the way for more nuanced and tailored approaches to diagnosis and management. This study serves as a foundation for a more comprehensive understanding of the clinical significance of LDS changes in venous ulcers, emphasizing the need for continued exploration in this critical area of venous insufficiency research.



CONCLUSION:

This comprehensive analysis of demographic and clinical data provides a foundation for understanding the characteristics of venous ulcers at different stages. The findings highlight the importance of early detection, considering the shift in age distribution across ulcer

types, and potential associations between GSV size, weight, and ulcer severity. Further research and interventions targeting specific demographics and clinical features may be crucial for improving the management and prevention of venous ulcers.

Conflict of Interest

There is no conflict of interest between the authors for the manuscript.

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