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Original Research Article

A comprehensive study of clinical features and management of ulcers of the lower limb

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ABSTRACT

Background: Leg ulcers are debilitating and painful, greatly reducing patient's quality of life. These ulcers are often difficult to treat and the successful treatment of leg ulcers depends upon the accurate diagnosis and treatment of the underlying cause.
Methods: This prospective cross sectional study was conducted by Department of General Surgery at College of Medicine and JNM Hospital, Nadia. The study was conducted during the period from September 2017 to August 2019 which included 193 patients presenting with ulcers of the lower limb and admitted in surgical wards of our hospital.
Results: Most of the patients were engaged in agriculture (23.8%) followed by business (22.8%) and service (14.5%). 52.03% of the patients had habit of smoking, chewing tobacco and drinking of alcohol. Most of the ulcers were diabetic (36.3%) followed by venous (22.3%) (Z=2.17; p=0.01). Only 4.7% and 3.1% were malignant and trophic ulcers. Peripheral neuropathy (23.3%) was the most common type of ulcer followed by venous hypertension (22.3%). At the end of study period, 180 ulcers were healed, 3 had recurrence, 5 were disease free and 5 patients died.
Conclusions: Thus, the study of various cases of leg ulcers arouses lot of interest and is mind boggling as far as the treatment of these cases are concerned. With the availability of arsenal of investigation wide range of antibiotics and with ever improving dressing material, there is certainly a great improvement in treatment of chronic leg ulcers.

Keywords: Lower limb ulcer, Leg ulcer, Chronic ulcer, Ulcer treatment

INTRODUCTION

Leg ulcers are debilitating and painful, greatly reducing patient's quality of life. These ulcers are often difficult to treat and the successful treatment of leg ulcers depends upon the accurate diagnosis and treatment of the underlying cause. A leg ulcer is an open sore that develops when the skin is broken and air and bacteria gets into the underlying tissue. This is usually caused by an injury, often a minor one that breaks the skin. In most people such an injury will heal up without difficulty within a week or two. However, when there is an underlying problem the skin does not heal and the area of breakdown can increase in size. This is chronic leg ulcer.

Chronic leg ulcers are defined as those that show no tendency to heal after 3 months of appropriate treatment or are still not fully healed at 12 months.[1] The incidence of ulceration is rising as a result of ageing population and increased risk factors for atherosclerotic occlusion such as smoking, obesity, and diabetes. Ulcers of skin can result in complete loss of the epidermis and often portions of the dermis and even subcutaneous fat.[2]

Chronic ulceration of the lower legs is a relatively common condition amongst adults and ulcer symptoms usually include increasing pain, friable granulation tissue, foul odor, and wound breakdown instead of healing. These results in social distress and considerable

healthcare and personal costs.[3,4] Since numerous factors lead to lower leg ulceration, it is essential that healthcare professionals adopt an interdisciplinary approach to the systematic assessment of the individual in order to ascertain the pathogenesis, a definitive diagnosis, and optimal treatment required. A correct diagnosis is essential to avoid inappropriate treatment that may delay wound healing, cause deterioration of the wound, or harm the patient.

Leg ulcers have wide spectrum of etiology, pathology, severity and morbidity. The man causes are venous valve insufficiency, lower extremity arterial disease and diabetes. Less frequent conditions are trauma, blood dyscrasias, infections, vasculitis, skin malignancies and ulcerating skin diseases such as pyoderma gangrenosum. But even rare conditions exist such as recently discovered combination of vasculitis and hypercoagulability. For a proper treatment of patients with leg ulcers, it is important to be aware of the large differential diagnosis of leg ulceration. A multidisciplinary approach is needed to treat this condition as it is reported to have impact on virtually every aspect of daily life: pain, disturbed sleep, mobility, restricted work capacity and personal finances are often adversely affected.[5-9] During the past three decades considerable knowledge has been gained regarding the pathophysiology and management of chronic leg ulcers. But still the treatment of these ulcers form a challenging task. Leg ulcers are classified specific, nonspecific and malignant ulcers. In this study the etiopathogenesis, clinical features, diagnosis and management of different ulcers of the leg and foot have been analyzed and discussed

Objectives of the study

The study objectives were to study the causal factors and clinical features of various types of lower limb ulcers; to compare and analyze the distribution of age, sex, systemic diseases, and location of ulcers among the study group; to study the usefulness of applied investigations; to effectively manage the condition and to and to prevent as far as possible leg ulceration in high risk individuals prone to the condition

METHODS

This prospective cross sectional study was conducted by Department of General Surgery at College of Medicine and JNM Hospital, Nadia. The study was conducted during the period from September 2017 to August 2019 which included all patients presenting with ulcers of the lower limb and admitted in surgical wards of our hospital during the study period.

A total of 193 patients were included who fulfilled study obligations. Calculation of sample size was done as following - the number of subjects for this study was 193.39~193 with power 94%. As per the study by Venugopal et al 87.2% of the chronic leg ulcers occurred due to more than five risk factors like pre-hypertension, hypertension, overweight, obesity, hypercholesterolemia and hypertriglyceridemia (p=0.872).[25] The formula used for sample size calculation was as follows:

$$n=\frac{4pq}{L^2}$$

Where,

n=required sample size
p=0.872 (as per the study by Venugopal et al)
q=1-p
L=loss% (Loss of information)

Inclusion and exclusion criteria

All patients presenting with ulcer of the leg were included in the study. Patients unwilling to consent for the study were excluded.

193 patients of chronic leg ulcers were selected randomly with the help of computer generated random numbers from the patients attending OPD or took admission in surgical ward of MRB Hospital, Kolkata.

Method of measurement of outcome of interest- The outcome of interest was morbidity and mortality of leg ulcer patients, the information of which was collected from case history sheet, relevant investigations and treatment. Limb salvage, amputation, poor control of diabetes mellitus, walking inability, poor pain management, recurrence of ulceration were considered as patient outcome. For calculation of risk factors likely to be associated with leg ulceration and calculation of patient outcome, patient's age, occupation(outdoor and indoor activities), smoking and drinking habits, presence of controlled or uncontrolled diabetes mellitus, ulcer location and characteristics, clinical examinations, arterial and venous circulation studies, biopsy of ulcer and medical and surgical treatments were taken into consideration.

After diagnosis of primary cause of the leg ulcers, management of ulcers by proper antibiotic coverage for gram positive, gram negative and anaerobic organisms, proper glycemic control, elevation of leg, compression bandaging, total cessation of smoking and causative drugs, nutritional support, vasoactive agents to restore blood flow, nerve stimulation, proper wound care with debridement slough excision and dressing. For large ulcers, as soon as the wound bed was ready, skin grafting had been considered. Specific treatment for venous insufficiencies, arterial disease with lumbar sympathectomy/transluminal angioplasty, malignant ulcers was investigated and workup done. They were treated accordingly by wide local excision/superficial radiotherapy/treatment of metastasis/multimodality treatment. Amputation was considered as a last resort for non-healing/spreading/gangrenous/malignant ulcers.

Rehabilitation with adjunctive foot wear was provided appropriately in selected cases. Education regarding foot care was provided to prevent future recurrence. Patients were reviewed on 7th day and 21st day after discharge and was found ulcer free.

Ethical issue

This study started after the clearance from ethical committee of College of Medicine and JNM Hospital. All the operative procedures followed were standard procedures. Written informed consent was taken from the participants before enrolment.

Statistical software

Sample size has been calculated with help of Epi Info (TM) 3.5.3. EPI INFO which is a trademark of the centers for disease control and prevention.

Statistical analysis

Using this software, basic cross-tabulation and frequency distributions were prepared. T-test was used to compare the means. P≤0.05 was considered statistically significant.

RESULTS

The mean (mean±SD) age of the patients was 51.94±12.25 years with range 19-80 years and the median age was 53.0 years. Test of proportion showed that the proportion of the patients with age between 40-69 years (84.0%) was significantly higher (Z=9.61; p<0.0001). Only 5.1% and 5.2% of the patients were with age<30 years and ≥70 years respectively. Thus leg ulcers were more prevalent in the age group 40-69 years.

Test of proportion showed that proportion of males 84.5% was significantly higher than that of females 15.5% (Z=9.89; p<0.0001). Thus the leg ulcers were more prevalent among males.

Corrected chi-square test showed that there was no significant association between age and gender of the patients (p=0.21). Thus the leg ulcers were evenly distributed over ages among both in males and females.

The mean (mean±SD) age of the male patients was 51.75±12.01 years with range 19-80 years and the median age was 53.0 years. The mean (mean±SD) age of the male patients was 52.96±13.75 years with range 25-80 years and the median age was 51.5 years (Table 1).

T-test showed that there was no significant difference between mean age of males and females (t_{191}=0.49; p=0.62).

Table 1: Age and gender distribution.

Age group (in years)	Gender		Total (%)
	Male	Female	
<20	2	0	2 (1)
20-29	5	3	8 (4.10
30-39	11	0	11 (5.7)
40-49	41	9	50 (25.9)
50-59	52	6	58 (30.1)
60-69	45	9	54 (28)
≥70	7	3	10 (5.2)
Total (%)	163 (84.5)	30 (15.5)	193 (100)
Mean±SD	51.75±12.01	52.96±13.75	

chi square=8.39; p=0.21 (not significant).

Most of the patients were engaged in agriculture (23.8%) followed by business (22.8%) and service (14.5%) (Figure 1).

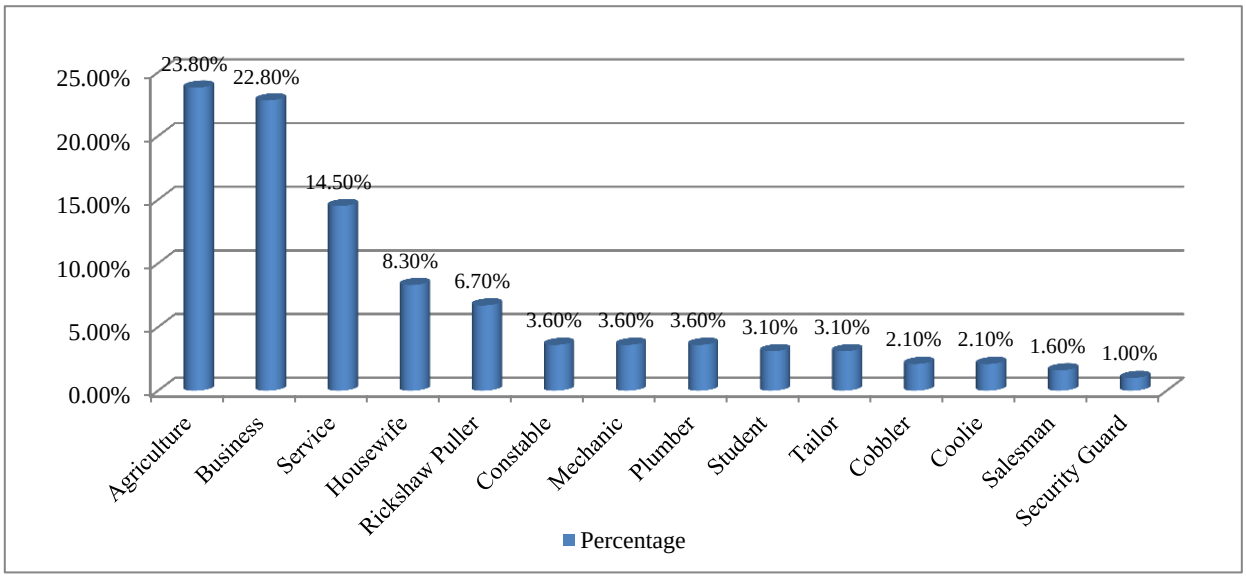

Figure 1: Occupation distribution.

52.03% of the patients had habit of smoking, chewing tobacco and drinking of alcohol. Out of 92 patients having any kind of personal habit 13% had smoking followed by chewing tobacco (9.3%) (Table 2).

Table 2: Distribution of personal habit.

Personal habit	Number	%
Smoking	25	13.0
Chewing tobacco	18	9.3
Smoking+alcohol	14	7.3
Smoking+chewing tobacco+alcohol	13	6.7
Alcohol	11	5.7
Chewing tobacco+alcohol	11	5.7
No habit	101	52.3
Total	193	100.0

Ulcers in the left leg (49.2%0 was higher than that of right leg (47.2%) but it was not significant (Z=0.28; p=0.77). Only 3.6% of the patients were having ulcers in both legs.

Most of the patients (61.7%) had ulcer at foot followed by gaiter (19.7%) and leg (18.7%). (Z=6.04; p<0.0001).

Most of the ulcers were diabetic (36.3%) followed by venous (22.3%) (Z=2.17; p=0.01). Only 4.7% and 3.1% were malignant and trophic ulcers (Table 3).

Table 3: Distribution of diagnosis of ulcers.

Diagnosis of ulcers	Number	%
Diabetic	70	36.3
Venous	43	22.3
Traumatic	30	15.5
Arterial	24	12.4
Malignant	9	4.7
Trophic	6	3.1
Others	11	5.7
Total	193	100.0

Peripheral neuropathy (23.3%) was the most common type of ulcer followed by venous hypertension (22.3%). Only 1 (0.5%) case of sickle cell disease was found (Table 4).

In 79.2% of the ulcers microorganisms were found which was significantly higher than that of no growth (20.8%) (Z=8.25; p<0.0001). Out of the microorganisms *Staphylococcus* (28.1%) was most common followed by *Pseudomonas* (14.1%) and *Klebsiella* (10.9%). Only in 2.1% of the ulcers, *Morganella* and *AFB* were present (Table 5).

Most of the patients (67.9%) had pain which was significantly higher than of no pain (32.1%) (Z=5.06; p<0.001).

Table 4: Distribution of pathology of ulcers.

Pathology of ulcers	Number	%
Peripheral neuropathy	45	23.3
Venous hypertension	43	22.3
Atherosclerosis	25	13.0
Peripheral neuropathy +atherosclerosis	21	10.9
Trauma	13	6.7
TAO	11	5.7
SCC	9	4.7
Bony defect	6	3.1
Pressure sore	6	3.1
Tubercular ulcer	4	2.1
Vasculitis	4	2.1
Poor hygiene	3	1.6
Leprosy	2	1.0
Sickle cell disease	1	0.5
Total	193	100.0

Table 5: Distribution of microorganisms.

Microorganisms	Number	%
Staphylococcus	54	28.1
Pseudomonas	27	14.1
Klebsiella	21	10.9
MRSA	16	8.3
Streptococcus	14	7.3
Proteus	12	6.3
Morganella	4	2.1
Acid fast *Bacilli*	4	2.1
No growth	40	20.8
Total	193	100.0

Muscle (35.2%) was the most common base of the ulcers followed bone (26.4%) and subcutaneous tissue (24.9%). Bone with tendon and only bone base was found in 6.7% of the cases. (Z=1.58; p=0.11).

Table 6: Type of floor of ulcers.

Floor of ulcers	Number	%
Unhealthy granulation tissue and slough	70	36.3
Pale granulation tissue and slough	43	22.3
Minimal slough	34	17.6
Necrotic tissue	14	7.3
Unhealthy granulation tissue	10	5.2
Fresh granulation tissue	7	3.6
Foul smelling slough	6	3.1
Raised granulation tissue at the wound edges	5	2.6
Raised abnormal granulation tissue extending beyond the margin	4	2.1
Total	193	100

Most of the floors of the ulcers were unhealthy granulation tissue and slough (36.3%) followed by pale granulation tissue and slough (22.3%). Only in 2.1% of the cases it was raised abnormal granulation tissue extending beyond the margin. (Z=2.17; p=0.03) (Table 6).

55.4% of the ulcers had shallow edge followed by sloping (20.7%) (Z=5.05; p<0.001). Only 1.6% was undermined. Most of the margin of the ulcers were irregular (38.3%) which was significantly higher (Z=2.46; p=0.0139) followed by thin bluish irregular (22.3%). Only 3.1% of the margin of ulcers was regular.

22.3% of the surrounding area was lipodermatosclerosis and hyper-pigmentation with itching. 31.1% of the discharge was slough with purulent discharge followed by serous (26.4%). In most of the cases debridement with dressing (29.0%) was done (Table 7).

Table 7: Type of surgical management.

Surgical management	Number	%
Debridement+dressing	56	29.0
Debridement+dressing+skin grafting	25	13.0
Debridement+dressing+disarticulation	23	11.9
Stripping Gsv/Ssv+hook phlebectomy	18	9.3
Hook phlebectomy	15	7.8
Stripping Gsv/Ssv	10	5.2
Id+debridement+transmetatarsal amp	9	4.7
Debridement+dressing+below knee amputation+angiography+balloon angioplasty	7	3.6
Wide excission+skin grafting	6	3.1
Debridement+dressing+lumbar-sympathectomy	5	2.6
Debridement+dressing+midtarsal amp+angiography+balloon angioplasty	4	2.1
Debridement+skin grafting+dressing	4	2.1
Debridement+dressing+below knee amputation	3	1.6
Below knee amp	2	1.0
Debridement+dressing+angiography+balloon angioplasty+skin grafting	2	1.0
Midthigh amp	2	1.0
Debridement+dressing+angiography+balloon angioplasty	1	0.5
Debridement+dressing+midthigh amp	1	0.5
Total	193	100.0

Most (56.0%) of the ulcers were in the Grade-II followed by Grade-III (34.7%). Only 1.3%, 2.7% and 5.3% were in the grade of V, I and IV respectively (Z=3.02; p=0.0025) (Table 8).

Table 8: Status at last contact.

Status at last contact	Number	%
Healed	180	93.3
Dead	5	2.6
Disease Free	5	2.6
Recurred	3	1.6
Total	193	100.0

DISCUSSION

In this study test of proportion showed that the proportion of the patients with age between 40-69 years (84.0%) was significantly higher (Z=9.61; p<0.0001). Only 5.1% and 5.2% of the patients were with age<30 years and ≥70 years respectively. Thus leg ulcers were more prevalent in the age group 40-69 years.

Cornwall et al, in their study found that 70% of the patients were over the age of 70 years and according to a study done by Callam et al, ulceration began before the age of 40 years in 22% of the patients.[11,12] This may be due to higher prevalence of venous (mean age: 36.0±9.4 years, median: 36 years) and traumatic ulcer (mean age: 39.3±14.8 years, median: 38 years) below 40 years and higher prevalence of diabetic (mean age: 55.4±15.5 years, median: 63 years) and arterial ulcers (mean age: 55.0±12.8 years, median: 55 years) in elderly age group in our study.

Test of proportion showed that proportion of males 84.5% was significantly higher than that of females 15.5% (Z=9.89; p<0.0001). Thus the leg ulcers were more prevalent among males.

Chronic leg ulcers are more prevalent in female then male, as reported in various literatures.[11,12] In our study where male to female ratio is 3.9:1, showing male predominance. A hospital based study in India reported male to female ratio of 5.7:1, which is similar.[13] This may be because of the fact that in India males are more

engaged in outdoor activities compared to female who remain indoors.

Corrected Chi-square test showed that there was no significant association between age and gender of the patients (p=0.21). Thus the leg ulcers were evenly distributed over ages among both in males and females. The mean (mean±SD) age of the male patients was

51.75±12.01 years with range 19-80 years and the median age was 53.0 years. The mean (mean±SD) age of the male patients was 52.96±13.75 years with range 25-80 years and the median age was 51.5 years. t-test showed that there was no significant difference between mean age of males and females (t_{191}=0.49; p=0.62)

No significant difference between sexes was found when age specific relative frequencies were compared (H=2.5357, df=4, p=0.6383) in a study conducted in India.[14]

Most of the patients were engaged in agriculture (23.8%) followed by business (22.8%) and service (14.5%). As per the study conducted in China majority of leg ulcers were among the farmers and agricultural workers as in the present study.[15]

52.03% of the patients had habit of smoking, chewing tobacco and drinking of alcohol. Out of 92 patients having any kind of personal habit 13% had smoking followed by chewing tobacco (9.3%). In a study on Indian patients found that there is a positive relationship between smoking and diabetes.[16] Cigarette smoking has been reported to have an impact on wound healing through impairment of tissue oxygenation and local hypoxia via vasoconstriction.[17] Tobacco smoke has high concentration of carbon monoxide, which binds hemoglobin, forming carboxyhemoglobin. Carboxy-hemoglobin binds to oxygen with high affinity and thereby interferes with normal oxygen delivery to hypoxic tissues.[18] Higher proportion of patients with smoking and drinking habit may be associated with greater population of diabetic leg ulcers in our study.

Ulcers in the left leg (49.2%) was higher than that of right leg (47.2%) but it was not significant (Z=0.28; p=0.77). Only 3.6% of the patients were having ulcers in both legs. In a study from Nigeria showed 17 ulcers on Left leg (51.5%), 15 ulcers on right leg (45.5%) and 1 (3%) ulcer on both leg in a population of 33 patients. But laterality of leg ulceration has no impact on the outcome of leg ulcer.[19]

Most of the patients (61.7%) had ulcer at foot followed by gaiter (19.7%) and leg (18.7%). (Z=6.04; p<0.0001). Our study was conducted in a government district hospital where most of the patients seeking medical advice belong to lower socioeconomic class. Beedi smoking is prevalent in lower socioeconomic class people who also walk and work bare footed, so more vulnerable to trauma to foot. Poor education and poverty prevents them to attend health care facility promptly.

Most of the ulcers were diabetic (36.3%) followed by venous (22.3%). (Z=2.17; p=0) Only 4.7% and 3.1% were malignant and trophic ulcers. Distribution of different type of ulcers in different studies varies 70% to 90% for venous ulcer, 5% to 15% for arterial ulcers and 1% to 5% for other ulcers.[20] All of these are based on population in western countries. But Indian study in prevalence of leg ulcer is limited to only one hospital based study. The study suggested that leprosy (40%), diabetes (23%), venous disease (11%), and trauma (13%) were among the causes of lower extremity wounds in patients attending that hospital. Thirteen percent of wounds were not directly linked to any known cause.[12] Arterial ulcer is seen among 25% patient in our study. In region where our hospital is present, prevalence of tobacco usage is about 50-65% in the population.[21] Higher rate of smoking and use of tobacco products, especially use of beedi smoking in Indian male could be the cause of more number of male patients compared to female and higher number of arterial ulcer in our study.[22] Also incidence Burger's disease among peripheral arterial disease is more in India (45-63%) than Europe (0.5-5.6%).[23] Beedi smoking is prevalent in lower socioeconomic class people who also walk bare footed, so more vulnerable to trauma to foot. Poor education and poverty prevents them to attend health care facility promptly. The above mentions causes may be the reason of more arterial ulcer in our study. Venous ulcers are significantly lower in our study (12.5%) compared to western studies. Only one study available in literature done by Malhotra on prevalence of varicose veins in Indian population, which showed the prevalence of varicose vein in rail road workers found to be 25.08% in south Indian and 6.8% in north Indian workers.[24] Leg ulcer due to malignancy, tuberculosis, neurotrophic causes are seen rarely.

Peripheral neuropathy (23.3%) was the most common type of ulcer followed by venous hypertension (22.3%). Only 1 (0.5%) case of sickle cell disease was found. In a community-based study from Chennai, south India, Pradeepa et al measured the prevalence of DPN using VPT by biothesiometer. The prevalence in newly diagnosed patients was 19.5% and 27.8% in those with known diabetes.[25] However, the frequency of DPN in the subjects without diabetes was not studied. The higher proportion of peripheral neuropathy is due to higher proportion of diabetic leg ulcers in our study.

In 79.2% of the ulcers microorganisms were found which was significantly higher than that of no growth (20.8%). Out of the microorganisms *Staphylococcus* (28.1%) was most common followed by *Pseudomonas* (14.1%) and *Klebsiell*a (10.9%). Only in 2.1% of the ulcers *morganella* and acid fast *Bacilli* were present. Similar result was reported by Mathangi et al in their study.[26]

Most of the patients (67.9%) had pain which was significantly higher than of no pain (32.1%) (Z=5.06; p<0.001). Similar study was reported by Hassan Ghassemi et al.[14]

Most of the ulcers were muscle deep containing unhealthy granulation tissue and slough with serous or purulent discharge, irregular or thin bluish margins, shallow edge followed by sloping edge, associated with lipodermatosclerosis and hyperpigmentation or induration. These findings were associated with more numbers of diabetic and venous leg ulcer patients in this present study.

Arterial ulcers were more common in 40-80 year group (mean 52 years) with male preponderance (91%) because of habit of using tobacco and alcohol (58.3%) and outdoor activities, mostly involving patients involving in agriculture and business. All ulcers were painful involving the foot with atherosclerosis with variable degree of peripheral arterial occlusion being the most common etiopathology. As discussed in review of literature, arterial ulcers were found to be deep punched out ulcers with majority had exposed tendon at the base (45.8%). Majority of arterial ulcers were dry or minimal discharge, containing necrotic tissue with associated hair loss, cold shiny skin, and brittle nail in the surrounding area. Most of the arterial ulcers were benefited by angiography or angioplasty with or without some sort of amputation.

Diabetic ulcers were more common around 60 years age group (mean 60±9 years) with male preponderance (87.1%) because of habit of using tobacco and alcohol (75.7%) and outdoor activities, mostly involving patients engaged in agriculture and business. Majority of the ulcers were located in the foot (88.6%).

Pain was present in 51.4%. Peripheral neuropathy alone (52.9%) or peripheral neuropathy in combination with atherosclerotic occlusion (30%) were the frequently involved in etiopathogenesis. As discussed in review of literature, diabetic ulcers were found to be irregular with shallow edge with indurations and excoriation of surrounding skin and of variable depth with majority had exposed bone at the base (64.3%). Majority of diabetic ulcers were containing unhealthy granulation tissue or slough at the floor, discharging purulent material. Diabetic ulcers were benefited by debridement and dressing (44.3%) and 47.1% required amputation along with debridement and dressing.

Malignant ulcers were common in 56-75 years age group (mean 64.33±6.18) involving male (55.6%) slightly more than female. 55.6% patients were engaged with agriculture. 100% ulcers involved right limb with foot (66.7%) being more common than leg (33.3%). Malignant ulcers were usually painless (88.9%). Malignant ulcers had variable depth, rolled out margin, everted edge, indurations of surrounding skin, fresh granulation tissue or minimal slough, serosangunous discharge which was offensive in 33.3% cases. Malignant ulcers were treated with wide surgical excision and skin grafting. 33.3% cases required amputation. Recurrence detected in 33.3% cases.

Venous ulcers were more common in 45-68 years of age (mean 51.58±4.72) with male preponderance (83.7%) and were involved mostly agriculture or service category. Gaiter area of leg involved in 83.7% with ulcer on left leg being more common (76.7%). Venous ulcers are muscle or subcutaneous tissue deep, with usually shallow edge, usually painful (76.7%) with 100% were having thin bluish irregular margin with pale granulation tissue at floor and lipodermatosclerosis, hyperpigmentation and itching in the surrounding area. Venous ulcers were cured 100% by compression stockings, Stripping GSV/SSV and Hook Phlebotomy.

CONCLUSION

In this study, we have been able to show that leg ulcers are common in elderly population and have negative impact on quality of life of affected patients. It has been found to be more common in males. The highest number of cases was found to be ulcer of the leg associated with diabetes mellitus, ulcer due to venous valve incompetence, traumatic ulcer, ulcers due to arterial occlusion secondary to atherosclerosis and TAO, malignant ulcers. A comprehensive assessment of patients' general status, personal habits, skin, vascular status, limb, ulcer characteristics are required to determine the etiology and to formulate effective treatment plan. Thus, the study of various cases of leg ulcers arouses lot of interest and is mind boggling as far as the treatment of these cases are concerned. With the availability of arsenal of investigation wide range of antibiotics and with ever improving dressing material, there is certainly a great improvement in treatment of chronic leg ulcers. Skin grafting when it becomes a choice for chronic ulcers with wide defects is indeed the right one.

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