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MANAGEMENT OF VENOUS ULCERS: STATE OF THE ART

Running title: venous ulcers

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Abstract

Venous ulceration is a complex and serious problem that affects 1-2 % of world population of > 65 years old and its incidence is actually increasing. The patients with more risk of development of Venous ulceration are the elderly. These lesions have a significant negative impact on patients quality of life. Our aim was to analyze the state of the art starting from the literature review.

The evidence supports that managing chronic wounds with a multidisciplinary wound care team significantly increases wound healing and reduces the severity of wound-associated pain and the required daily wound treatments compared to persons not managed by a wound care team.

Keywords: Chronical venous ulceration, chronic venous insufficiency, chronic legs ulcers

Abbreviations: VU venous ulceration

1. Introduction

Venous ulceration is a complex and serious problem that affects 1-2 % of world population of > 65 years old and its incidence is actually increasing [1].

Varicous veins (VV) without skin changes are present in about 25-30% of female and in 10-20% of male in western countries, and VU represents its most severe clinical manifestation, contributing significantly to the cost of health care [2] .

In USA venous ulcers have been estimated to cost 3 billion dollars per years [3].

Vascular disease is very common in Italy, in particular in elderly people living in the South in which, correlation between arterial sufficiency, varicose veins and venous incompetence, seems to be more marked in men [4].

These lesions have a significant negative impact on patients' quality of life because the management is very difficult and they are also frequently painful and malodourous [5].

2. Review

2.1 Clinical classification

There are 3 different type of chronic legs ulcers: venous, arterial and mixed. Venous pure insufficiency is at base of 70-80 % of all chronic legs ulcers; mixed venous and arterial ulcers account for approximally 15-30 % of VU and arterial pure insufficiency is the cause of 4-7 % of chronic legs ulcers.

Pure venous ulcers (VU) are the most common type of legs ulcers [6] and they have been described since Hippocrates' time6. In order to allow uniform diagnosis and comparison of patient populations, in 1994 an International ad hoc comitee of American Venous Forum developed a general classification of VU, called CEAP, based on clinical class (C), ethiology (E), anatomical distribution (A) and underlying pathophysiology (P). CEAP classification has been reviewed in 2004 with an improvement of underlying details including terminology; in order to encourage a wider use among clinicians an abbreviated version or "basic" CEAP was adopted as alternative to the comprehensive version [7, 8].

2.2 Cause

The exact cause of VU formation in patients with cronic venous insufficiency remains unknown, last studies are focused on role of macromolecules and infammation.

Several past studies enphatized the role of high venous pressure: in 1989 Allman et al. defined that the four major etiologic factors that involved in the development of venous ulcers are: pressure, shearing forces, friction, and moisture [9].

Araki et al. have shown that the deficiency of the calf muscle pump is significant with regard to the severity of venous ulceration [10].

At base of VU disease, normally there is high pressure in an incompetent long saphenous system that, in association with an incompetent ankle perforators vase, gives rise to substained high venous pressure to fine venous peripheral arches. In fact venous hypertension leads to extravasation of eritrocites and macromolecules in interstitium with a recruiment of leucocytes (especially macrophages and mastzellen) that play a role in cytokine activation. Leucocytes are localized in extracellular matrix around capillaries and post capillary-venules and, in attempt to maintain vascular architecture in response to increased pressure, they determinate a release of inflammatory cytokines that determinate fibrosis and alteration of balance tissue inhibitors of metallo proteases (TIMPS) and metallo proteases (MMP), with a retardation of ulcers healing [11].

2.3 Risk factors

Several risk factors for chronic venous ulcer have been recognized: older age, family history of varicose veins, and constipation, whatever the sex; obesity and lack of physical activity were strongly associated with CVI in women, more so than in men [12]. Female gender is a risk factor itself, especially with an history of multiple pregnancy even if disparity between male and female seems to decreas with age.

Secondary risks factors are previous injury in legs (DVT), and remaining in the standing position for a long time; the role of the prolonged sitting position was not well established.

In literature there are also described like VU risk factors like varicocele and genetic mechanism of heredity particurarly in older age [13].

2.4 Signs and symptoms

Most principals symptoms to detecting VU are swelling, legs pain, bleeding and stasis dermatitis. The pain of VU is heavy and brusting and it keeps the patients specially during movements and night. The VU are usually large, shallow and rounded lesions; frequently they appeared infected with granulating base and reactive fibrosis.

2.5 Therapy

The target of ulcer treatment should always be directed to the cause of the ulcer.

First step treatment of VU is application of local drugs, bandage and possible somministration of heparin. Treatment modalities are aimed to reducing venous insufficiency; there are 3 type of non invasive managements: medical therapy, bandage, dressings

2.5.1 Medical therapy: Diuretic therapy is a first-step therapy but it hasn't no more long-therm efficacy.

In sovra-infected ulcers there is no evidence to support the routine use of systemic antibiotics in promoting healing of venous leg ulcers.

In terms of topical preparations, some evidence supports the use of cadexomer iodine [14].

Herbal supplements may reduce the inflammatory response to venous hypertension, but are not licensed by the US Food and Drug Administration, and vary in their efficacy, quality, and safety [15].

2.5.2 Bandage: Legs compression with bandage is fundamental in order to aim venous return and the bandage is a valid support in VU. It prevents the interface with the ulcers and guarantees the compression of dilated veins. In a recent Cochrane review there is some evidence that venous ulcer heal more rapidly with compression than without, and that multi-component bandage system achieve better healing results than single component bandages [16].

The period between banding and re-banding is variably (1-3 days) and depends on the type of VU and patient.

The bandage should be a "two-way stretch" type that ensure a crossed compression for reducing oedema and support venous blood return.

Compression bandage should encouraged by walk and get up legs during sit position.

2.5.3 Dressings: A variety of dressings add to manage VU are available and they are divided into: hydrocolloids, hydrogels, alginates, foam and antimicrobial dressing [17,18].

Hydrogel dressing consist of cross-linked insoluable polimers and up to 96% of water. These dressing are used on dry wounds, and facilitate autolytic debridement of necrotic tissue. The use of a secondary non adsorbent dressing is required [19].

Hydrocolloids dressing are occlusive dressing composed of a hydrocolloid matrix bonded onto a vapour-permeable film or foam backing. When in contact with exudate this dressing form a gel that facilitate rehidratation in ulcers with low to moderate drainage [20].

Foam dressing contain Hydrofilic foam and they are suitable for all type type of exuding wounds. They can be used in combination with other primary dressing. Placed over the ulcer prior to the application of compression they promote healing and prevent stiking of bandage on wound.

Actually there is not evidence that foam dressing are superior in haeling compared with other dressing. Some evidence shows that they may be better than hydrocolloids in handilng essudate and easier to remove [21].

Alginates can be used in cavities and complicated lesions, When in contact with exudate this dressing form a gel that facilitate rehidratation in ulcers with moderate to heavy drainage, promoting autolic debridement. Calcium iones may aid blood clotting in bleeding lesion but this can determinate adherence to wound surface.

At present there is no evidence to suggest any difference in terms of wound healing between different alginate dressing or between alginate dressing and hydrocolloid. It is possible that hydrogel results easier to remove than alginate dressing. Further studies of good quality are required to demonstrate the efficacy of different dressing [22].

Antimicrobial dressing as the one with Ionized silver (Ag+) has both anti-inflammatory and antimicrobial properties with a broad spectrum of action and should be used in selected patients when an infection is suspected [23,24].

The use of silver dressings improves healing time and can lead to overall cost savings [25].

2.5.4 New research: In 2014 Serra et al. demonstrated that inhibition of metalloproteinases could represent a possible therapeutic intervention to limit the progression of leg ulceration; in particular they demonstrated the efficacy of Sulodexide in patients with mixed arterial and venous chronic ulcers of the lower limbs [26].

3. Conclusion

VU of the legs are a common and important problem. An accurate physical examination is necessary to make a proper diagnosis but the true problem is the management; it's very important to know the ulcer's nature in oder to choose the best type of treatment.

Most of VU can be treated with pharmacological medications but the resolution process is long and weary.

Currently there are many types of dressings used for the treatment of VU. Compressive bandage is fundamental to complete recovery because it ensures a physiologic venous return, relieves the oedema and assists the pumping effects of muscles.

Surgery treatment is indicated in venous lesion is indicated in case that are resistant to medical treatment or in lesion with biopsy positive for cancer.

The evidence supports that managing chronic wounds with a multidisciplinary wound care team significantly increases wound healing and reduces the severity of wound-associated pain and the required daily wound treatments compared to persons not managed by a wound care team.

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