



Care of Decubitus ulcer among chronic bed ridden patients in home level at Cuddalore District, Tamilnadu, India.

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Abstract

Pressure ulcers are skin or soft tissue lesions that develop as a result of persistent pressure being applied to particular body parts. They need to be treated right once since any consequences from these injuries might be lethal. The main goal of therapy is to lessen the force being applied to the lesion. Depending on the severity/stage of the pressure ulcer, several treatments are available. In order to provide patients with the best care and results, this exercise covers the aetiology, pathophysiology, and histology of pressure ulcers in addition to highlighting evaluation and treatment options based on an interdisciplinary approach. Although there are more medicines on the market, none have clearly outperformed the others, making pressure ulcer therapy difficult and time-consuming. To create solutions that are more successful at treating and preventing pressure ulcers, further research is required.

Keywords: Pressure ulcer, Honey dressing, Aloe vera dressing, decubitus

Introduction

Decubitus ulcers are skin and soft tissue lesions that develop as a result of continuous or prolonged pressure being applied to the skin. They are also known as bedsores or pressure ulcers. Most frequently, these lesions affect individuals who have health issues that limit their movement, making postural adjustment challenging (Bansal et al., 2005). French physician Jean-Martin Charcot observed that patients who experienced sacral and buttock eschar eventually passed away. He gave it the moniker "decubitus ominous," which indicated that once it appeared, death was certain (Levine, 2005).

Etiology

Decubitus ulcer growth is complicated and multifaceted. The most significant factors that contribute to the development of these ulcers are loss of sensory perception, locally and generally impaired loss of consciousness, and restricted movement because patients are not aware of their discomfort and do not alleviate the pressure (Anders et al., 2010). These ulcers are the result of simultaneous internal and environmental variables at play. The development of these lesions is sped up by internal and external causes like fever, starvation, anaemia, and endothelial dysfunction. A decubitus ulcer can form in a patient who is bedridden or having surgery after as little as two hours of immobility. (Bansal et al., 2005)

The development of these ulcers may in part be attributed to the malfunctioning of nerve regulatory systems that control local blood flow. Long-term pressure on tissues can result in capillary bed blockage, which lowers the area's oxygen levels. The ischemic tissue starts to build up harmful compounds over time. The result is tissue necrosis and ulceration (van Marum et al., 2002).

Prevalence (Zhang et al., 2021; Mervis and Phillips, 2019)

In 1990, there were 0.42 million prevalent instances of decubitus ulcer worldwide, with an age-standardized prevalence rate of 12.6 (11.3 to 14.0) per 100,000 people. Decubitus ulcer common instances were 0.85 (95% UI 0.78 to 0.94) million cases in 2019, with an age-standardized point prevalence estimate (per 100,000 population) of 11.3 (95% UI 10.2 to 12.5). From 1990 to 2019, the age-standardized prevalence rate dropped by 10.6% (95% UI 8.7 to 12.3%).

At the geographical level, high-income North America (34.6 [31.9 to 37.6]), Central Latin America (27.4 [24.6 to 30.4]), and Tropical Latin America had the highest age-standardized prevalence rates of decubitus ulcers per 100,000 people in 2019. (24.3 [22.2 to 26.8]). Between 1990 and 2019, different areas had different percentage changes in age-standardized prevalence rates of decubitus ulcers. The highest rates were found in Southeast Asia (64.9% [59.6 to 71.1%]), Southern Latin America (57.0% [47.5 to 68.6%]), and South Asia (32.1% [28.6 to 35.5%]), although all regions, with the exception of four (high-income Asia Pacific, Western Europe, Australasia, and High-income North America), showed an upward trend between 1990 and 2019. Also in 2019, we discovered that among the 21 GBD locations, the contribution to the total number of common cases varied by around 900 times. The highest number of prevalent cases were recorded in high-income North America (0.22 [0.20 to 0.24] million), Western Europe (0.17 [0.15 to 0.19] million), and East Asia (0.09 [0.08 to 0.10] million) in 2019.

Decubitus ulcers caused 3.17 million incident cases, 0.13 million YLDs, and 0.85 million prevalent cases worldwide in 2019. For decubitus ulcers, the ASRs for prevalence, incidence, and YLDs were 11.3, 41.8, and 1.7 per 100,000 people, respectively. It was discovered that the greatest point prevalence estimates were obtained in high-income North America, Central Latin America, and Tropical Latin America.

Stages of pressure ulcers

Sacral decubitus ulcers can be staged in a variety of ways. The National Pressure Ulcer Advisory Panel (NPUAP) method is the most often used categorization scheme. It categorises these ulcers based on the depth of the ulcer. (Bansal et al., 2005; Yarkony et al., 1990).

The stages are as follows:

Grade I: There is non-blanchable erythema in a small, localised region, generally over a bony prominence, although the skin is otherwise unharmed. Darkly pigmented skin could not blanch visibly and instead have a different hue from the surrounding skin.

Grade II: The epidermis and dermis both exhibit partial thickness loss of skin, which manifests as a shallow open ulcer with a reddish-pink wound bed and no slough. Also possible to see an intact or open/ruptured blister filled with serum.

Grade III: A whole layer of skin is lost, reaching the subcutaneous tissue but not the fascia underneath. There's a chance the lesion smells bad. Slough could be visible, but it doesn't hide how much tissue has been lost. includes digging tunnels and undermining.

Grade IV: There is significant tissue loss along with full-thickness skin loss that extends through the fascia. Muscle, bone, tendon, or joint involvement might be a possibility. Some areas of the wound bed may have eschar or slough. involve tunnelling and undermining often.

Ungradable: Full thickness tissue loss with slough (yellow, tan, grey, green, or brown) and/or eschar (tan, brown, or black) covering the base of the ulcer in the wound bed

Scaling of decubitus ulcers

In other words, the fundamental PURAS criteria, which are especially those to be regarded vital for assessing and/or validating a scale, have been highlighted by a number of writers. (Halfens, 2000; Ayelo and Braden, 2002). The ideal scale should have the following features

- High sensitivity
- High specificity
- Good predictive value
- Ease of use, for all professionals regardless of their experience.
- Precise definition of terms
- Applicable to the different clinical settings where ulcers appear or to those patients at risk

Norton Scale

The first PURAS reported in academic literature was the Norton scale. It was created by Norton et al. (1962) while doing research on elderly patients, and it is now widely used. The scale uses a four-point scoring system, with 4 representing the best state for each parameter and 1 the worst, and takes into account five factors: mental status, incontinence, mobility, activity, and physical condition. Lower numbers indicate more risk on this evaluation scale, which features inverse scoring. At first, a cutoff point of 14 or less signified a moderate risk while a cutoff point of 12 or less indicated a high risk of developing pressure ulcers.

One of this system's key flaws is that the applied parameters lack a functional definition. It excludes dietary considerations. Additionally, it ignores the forces that cause friction on the skin's surface.

Waterlow Scale

This scale was established by Judy Waterlow in the UK (1985) as a result of a research on the prevalence of pressure ulcers, where she discovered that the Norton scale failed to include many individuals who later acquired pressure ulcers in the "at-risk" category. Waterlow provided a scale with six subscales—height/weight relationship, continence, skin appearance, mobility, age/sex, appetite—and four categories of additional risk variables after evaluating the elements that contribute to the aetiology and pathogenesis of pressure ulcers (tissue malnutrition, neurological deficit, surgery, and medication)

Although Waterlow's scale is used in the UK, it is not commonly utilised. More patients than those who are truly at risk are frequently classified as being "at-risk" by this method. As a result of the numerous characteristics that must be considered, its application is complicated. It establishes that women are more at danger than males.

Braden Scale

The Braden scale was created in the United States in 1987 as part of a study initiative in residential care settings to address some of the Norton scale's shortcomings (Braden and Bergstorm, 1987). The Braden scale contains six subscales, each of which has a functional term definition that must be verified: sensory perception, skin exposure to humidity, physical activity, mobility, nourishment, friction, and shear resulting in skin injury. The Braden scale, which has a range of 5 to 23 points, is an inverted scoring instrument, meaning that the lower number signals major danger. Patients who score the same as or less

than 16 on this scale are considered to be "at risk"; 15–16 is considered to be "low risk," 13–14 is considered to be "moderate risk," and 5–12 is considered to be "high risk." The findings of more than a dozen studies for the Braden scale validation in various care settings, including hospitals for acute patients and long-term institutions, including intensive care, nursing homes for the elderly, and home care, are presented in Table 6.10. As can be shown, this scale has the best evidence supporting its utility, is extremely sensitive and specific, and has the highest level of validation from scientific literature. The fundamental issue is that it takes more training to operate than the Norton scale, making it more difficult to utilise.

Complications of pressure ulcers (Teasell and Dittmer, 1993)

With decubitus ulcers, complications frequently appear. The most typical issue is infection. Grade III and IV ulcers need to be managed carefully since their consequences might be fatal. Aerobic and anaerobic bacteria are both found in the lesions, according to microbial studies. Osteomyelitis, septic arthritis, periostitis (infection of the layer covering the bone), and sinus development are all possible outcomes if the infection extends to deeper tissues and the bone (abnormal cavity formed by loss of tissue). Because septicemia is difficult to treat in a patient who is already weak, the invasion of the infectious agent has lethal implications.

They are catabolic wounds (meaning that they use up a lot of energy). Due to the catabolic nature of these ulcers, significant protein and fluid loss occurs, which may induce hypoproteinemia or malnutrition. An ulcer that is draining might cause daily protein losses of up to 50 grammes. Chronic decubitus ulcers may result in secondary amyloidosis or chronic anaemia. Anemia can also develop as a result of ongoing bleeding and water loss. Inadequate postoperative care might lead to difficulties after reconstructive surgery. These include the development of hematomas or seromas, wound dehiscence, the growth of abscesses, or postoperative wound infection.

Treatment

Decubitus ulcers are challenging to cure since there is no set treatment plan or strategy. Once it has manifested, therapy should not be postponed, and care should begin right once. The kind of treatment depends on the location, stage, and ulcer-related problems. All of the many treatment approaches aim to maintain the ulcer as aseptic or least septic as possible by reducing moisture, pressure, and contact between the ulcer and a hard surface. The stage or grade of the ulcer and the intended therapeutic goals (reducing moisture, removing necrotic tissue, or managing bacteremia) should be taken into consideration while selecting a course of treatment (McInnes et al., 2015). Whether surgical care may be necessary depends on the depth and severity of the ulcer. To get rid of any dead tissue and debris, the ulcer has to be properly cleansed and drained. A preoperative method for creating a favourable wound for the surgical closer is vacuum-assisted closure (VAC). Through flap repair, surgical therapy seeks to close the gap and provide lasting skin (Batra and Aseeja, 2014). Additionally, there is some evidence that hyperbaric oxygen therapy, which enhances oxygenation in and around the wound, can aid in wound healing (Kranke et al., 2015)

Use of air-fluidized or foam mattresses, regular posture adjustments, supplying proper nourishment, and treating any underlying systemic disorders are all recommended. Debridement is necessary to get rid of the dead tissue that makes the best environment for bacterial development. Dressings that promote wound healing, such as hydrogels or hydrocolloids, should be utilised. Tissue cultures are required in order to provide the most targeted antibiotic, which may entail the pharmacist and the most recent antibiogram information. Analgesics should be administered to the patient to keep them pain-free. If at all feasible, they should aim to improve their physical activity, which a rehab nurse, medical assistant, or nurse's aide can help with. A team approach to patient education and management combining the wound care clinician

and wound care nurse will produce the greatest outcomes. Frequent follow-ups are an imperative need. Better results for patients with decubitus ulcers may result from these interprofessional actions.

Dressings

The classification of dressings usually depends on the key material used in their construction, and whether additional substances are added to the dressing. Several attributes of an ideal wound dressing have been described (Bradley et al., 1999).

Conventional treatment using Aloe vera dressing

In 2016, an orthopaedic unit in Arak, Iran, was the site of a randomised, triple-blind clinical experiment that involved 80 patients who had been carefully chosen. Based on the blocking sampling approach, patients were randomly allocated to two intervention and control groups. Nurses provided the standard daily maintenance to avoid bed sores in each group. In the intervention group, pure Aloe Vera gel was applied to the regions of the hip, sacrum, and heel twice daily (at the hours of 9 and 21), in contrast to the control group, which only received placebo (a gel made of water and starch) to prevent bed sores. On days 3, 7, and 10, the sacrum, hip, and heel of both groups were examined for any indications of pressure ulcers. The mean age of the patients in the intervention group was (41.71 11.50) years, compared to (42.34 12.19) years for the control group. One patient with hip pain and two persons with sacral pressure ulcers were in the intervention group. In the control group, 3 individuals had hip pressure sores, 8 had sacral pressure ulcers, and 1 had heel pressure sores (Hekmatpou et al., 2018).

Hekmatpou looked at all therapeutic trials utilising Aloe vera gel, cream, or derivatives that included a placebo control group or comparison with other therapies in his study (2019). The findings of the 23 research demonstrated that aloe vera has been used to treat and prevent skin ulcers as well as burns, pressure ulcers, cracked nipples, genital herpes, and post-operative wounds.

In order to compare the effects of Aloe vera gel, Calendula officinalis ointment, and straightforward sacral preventive bandages on the development of pressure injuries in patients admitted to critical care units, a research was created. The results of this study, which included 90 critically ill patients, revealed that no pressure injuries developed in the patients who received the Aloe vera gel dressing, while there were two cases of wounding in patients who received the Calendula officinalis ointment dressing and three patients (10%) in the simple dressing group. The chi-square test findings revealed that the two groups receiving Aloe vera gel and basic treatment had distinct frequency distributions for the emergence of pressure injuries. Statistics showed that this difference was significant ($p < 0.05$). The Aloe vera gel and Calendula officinalis ointment groups, as well as the Calendula officinalis ointment group and the basic dressing group, did not significantly vary from one another, though (Baghdadi et al., 2020).

Medical-grade honey is utilised in honey-impregnated dressings, which may be applied to both acute and chronic wounds and are said to have antibacterial and anti-inflammatory qualities. Examples are Activon Tulle and Medihoney (Medihoney) (Advancis). A gauze dressing infused with honey facilitated more rapid pain alleviation throughout the course of therapy and reduced discomfort with each dressing change. When compared to other topical ointments, honey has been shown to have a 4 times quicker healing rate. The study did not, however, significantly substantiate honey's antimicrobial properties. However, topical honey use quickly speeds up wound healing in PU (Halim and Dwimartutie, 2020).

The effectiveness of a honey dressing vs an ethoxy-diaminoacridine plus nitrofurazone dressing was compared in a research on individuals with pressure ulcers. Eleven patients with 25 pressure ulcers received ethoxy-diaminoacridine with nitrofurazone dressings, whereas 15 patients with 25 pressure ulcers received honey dressings. Patients who received honey dressing therapy had substantially higher PUSH tool scores after 5 weeks of treatment compared to those who received the ethoxy-diaminoacridine with nitrofurazone dressing. (Yapucu Güneş et al., 2007)

A study was conducted to determine the efficacy of honey in treating cancer patients' bedsores in terms of speed of wound healing and pain management. Between July 2010 and September 2011, 40 cancer patients with bedsores who attended our department's palliative clinic were randomly allocated (1:1 ratio, or 20 in each arm) to the study arm (honey with metronidazole powder) or the control arm (just metronidazole powder). Significant differences in the study arm's wound healing state as of day 10 and in terms of pain relief as of day 7 were also present. (Saha et al., 2012).

Vacuum suction for pressure ulcer

Argenta and Morykwas initially suggested the vacuum-assisted closure as a non-pharmacologic, non-surgical method of controlling wound healing in 1997. The use of suction promotes healing by decreasing oedema, infections, and increasing local blood flow. 3 It is used as a supplemental treatment or as an alternative to surgery for a variety of wounds in an effort to reduce morbidity, hospital costs, and length of stay while enhancing patient comfort (Orgill, 2004).

Due to VAC, cells undergo microdeformation and microstrain, which results in tissue expansion and the release of growth factors. The differential pressure in the tissues following the application of negative pressure is what causes this tissue expansion effect. Positive pressure exists inside the cells, whereas negative pressure exists outside the cells and below the dressing. As a result, the size of the wound may be reduced through cell proliferation, the development of granulation tissue, and the drawing together of the wound margins (Wilkes et al., 2007). Hyperbaric pressure, however, may result in ischemia and necrosis in ischemic tissue. Negative-pressure wound treatment on ischemic tissues, particularly when they are circumferential, should thus be utilised with caution.

Conclusion

For patient comfort and to reduce the danger of systemic infection, pressure ulcers must be treated. Debridement of devitalized tissue, management of lingering infection with antibiotics, medical and nutritional patient optimization, suitable dressing selection, and periodic monitoring of the evolution of the wound are the pillars of treatment as described above. Additional therapy, such as biophysical modalities, can be attempted if normal techniques are insufficient. Reconstructive surgery is an option for big ulcers, ulcers when wound healing is not going as it should, and ulcers where persistent osteomyelitis is present. Novel medicines and dressings have not demonstrated greater efficacy than others, however they may be useful for some patients. Improvements in prevention should be a primary focus of study, considering the consequences that pressure ulcers developed in hospitals presently face.

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