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What is the Silver Dressing?

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Abstract: *Silver and its compounds have long been used for the disinfection of medical devices and water purification. In medicine increasing evidence indicates that topical ionized silver is effective for managing increased superficial bacterial burden in wounds to promote and stimulate healing of chronic ulcers. The use of silver dressings in wound care has recently been faced with considerable challenges Which emphasizes the search for clinical effectiveness of the use of bandages silver needs a lot of scientific research to reveal the rest of his secrets and these are some suggestions for a number of health team for future research studies*

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I. Introduction

Silver and its compounds have long been used for the disinfection of medical devices and water purification. The topical antimicrobial agent silver has been used for hundreds of years in wound care4. For example, silver has been used to prevent or manage infection in its solid elemental form (eg silver wire placed in wounds), as solutions of silver salts used to cleanse wounds (eg silver nitrate solution), and more recently as creams or ointments containing a silver– antibiotic compound (silver sulfadiazine (SSD) cream.[1] In medicine Increasing evidence indicates that topical ionized silver is effective for managing increased superficial bacterial burden in wounds to promote and stimulate healing of chronic ulcers. .[2]

Today, Some bandages use silver to help reduce wound bacteria count. it has been used for its antibacterial properties for thousands of years, yet in healing.[3] Recent studies have demonstrated that, in many chronic wounds, bacteria persist in adhesive, polymeric matrix biofilm communities. [4-5] Due to the properties of this extracellular polymeric substance and the ability of quorum sensing, these biofilms can induce chronic inflammation, which delays healing and causes the wound to become more resistant to antimicrobial therapy[6-8] Attention in the wound care field is currently focusing on the role that biofilm plays in impairing healing of a chronic, non-healing wound. The aim of treatment with silver dressings is to reduce wound bioburden, treat local infection, and prevent systemic spread: their main purpose is not to promote wound healing directly. Clinical guidelines recommend that silver dressings are used for wounds where infection has already established or an excessive wound bioburden delays healing. Thus, silver – as an antibacterial agent - promotes healing in an indirect manner, because an infected wound cannot and will not heal as quickly as a clean one.[2]

How the silver dressing work?

Silver's molecular makeup allows it to stop most bacteria from creating chemical bonds. The bacteria, once in contact with the silver, cannot multiply, and are broken down due to active silver's properties. Silver is so good at providing bacterial protection that many clinics and hospitals use silver-based surgical tools as well as furniture to help limit the spread of any disease.[9]

In Silver dressings are topical wound care products derived from ionic silver. These products release a steady amount of silver to the wound and provide antimicrobial or antibacterial action. The silver is activated from the dressing to the wound's surface based on the amount of exudate and bacteria in the wound. It is are available as foam dressings, hydrocolloids, barrier layers, and charcoal cloth dressings. Silver dressings may be used with select topical and adjunctive therapies to decrease the bacterial load, contain exudate, and optimize the appearance of the wound's granulation tissue[10]. Also, The active agent, silver ions, are effective in killing microbes instantly by blocking the respiratory enzyme system whilst remaining non-toxic to human tissue. Silver dressings are commonly used in the treatment of burns and chronic wounds[11-12].

In recent studied regarding how the Silver ions work discovered that, the Silver ions are highly reactive and affect multiple sites within bacterial cells, ultimately causing bacterial cell death. They bind to bacterial cell membranes, causing disruption of the bacterial cell wall and cell leakage. Silver ions transported into the cell disrupt cell function by binding to proteins and interfering with energy production, enzyme function and cell replication [13-14]. Silver ions are active against a broad range of bacteria, fungi and viruses[13]., including many antibiotic-resistant bacteria, such as meticillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant Enterococci .[14]

The effects of silver dressings wound healing:

Silver (Ag) has been thought to improve wound healing and reduce instances of associated infections for many years. There are centuries-old records of silver being used in wound treatment, but the past two decades in particular have seen an increasing clinical application of silver-impregnated wound dressings and as such, have seen the number of research articles similarly increase. The majority of these articles focus on the positives and potential negatives (e.g. the toxicity of silver as a heavy metal) of using silver-impregnated dressings in the clinical management of wounds[15]. In practice, Silver dressings are increasingly available and used in wound management[3] . most healthcare practitioners rely on clinical signs and symptoms to diagnose wound infection [16-17]. Even where microbiological services are readily available, it is not recommended that microbiological tests are performed routinely [14].

Silver dressings may be used on acute wounds, such as traumatic wounds (including burns) or surgical wounds, and chronic wounds that present with localised (overt or covert), spreading or systemic infection. Manufacturer's instructions should be followed regarding wound cleansing and method of application of silver dressings (eg recommended cleansing materials and whether hydration of the dressing is required. [3]

Cost effectiveness:

Thorough assessment of the cost effectiveness of a healthcare intervention is complicated and considers many factors, including resource use, quality of life issues and economic parameters **[18]**.A number of studies have found that silver dressings are associated with factors that may be beneficial in terms of cost effectiveness, eg: reduced time to wound healing ,shorter hospital stays **[19-20]** , reduced dressing change frequency , reduced need for pain medication during dressing change **[21-22]**

Challenges of using silver dressing

The use of silver dressings in wound care has recently been faced with considerable challenges. These include a perceived lack of efficacy and cost effectiveness, and questions about safety . In some healthcare settings, these challenges have led to restrictions in the availability or complete withdrawal of silver dressings. **[23]**

Advantage and disadvantage of silver dressing:

There are many advantages to using silver dressing as Inhibits pathogen growth, especially of antibiotic-resistant strains which Provide a broad range of antimicrobial activity**[24]**. Play a major roles for antimicrobial dressings such as silver dressings in the management of wounds through prevent and reduce infection in acute or chronic wounds that are infected or are being prevented from healing by microorganisms and act as an antimicrobial barrier for acute or chronic wounds at high risk of infection or re-infection1**[24]**

Although there are advantages of silver bandages, they do not neglect the existence of some disadvantages such as a secondary dressing is needed to secure silver dressings in place. These dressings can't be used in patients sensitive to silver and must be removed (and the wound cleaned) before the patient has magnetic resonance imaging**[24]** Silver dressings aren't recommended for use together with topical medications. Because silver turns black when it oxidizes, it may stain or discolor periwound tissue. Also, the use of ionic silver and silver derivatives for treatment and prevention of infection of burn wounds or skin grafting has been associated with a number of side effects such as cytotoxicity, staining, methaemoglobinaemia and electrolyte disturbance, longer slough separation time. In addition; It is Contraindicated for stage I pressure ulcers, third-degree burns, and nonexudating wounds**[10]**.

II. Conclusion

Despite the use of Silver dressing in a lot of wounds, but the health team workers, especially work in clinical area believe that the search for clinical effectiveness of the use of bandages silver needs a lot of scientific research to reveal the rest of his secrets and these are some suggestions for a number of health team for future research studies

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