

Case Report

Advances in Bioengineering & Biomedical Science Research

Staphylococcus Vs Pseudomonas: The Fundamental Role of 1% Cream Micronized Silver Sulfadiazine as a Therapy of Excellence to Combat Bacterial Superinfection– Observational Study

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Submitted: 16 Jan 2020; Accepted: 22 Jan 2020; Published: 06 Feb 2020

Introduction

A wound, due to the loss of skin continuity and the presence of necrotic tissue, is an ideal medium for the multiplication of germs. The infection is the main enemy of a wound because it delays its healing and promotes chronicization.

The danger is the critical colonization of the wounds: important presence of replicating bacteria that leads to delay in healing in the absence of an actual infection.

Another problem that is incurred in critical colonization is the formation of the biofilm: thin layer of glycoprotein material (glycocalyx) processed by bacteria in active replication that appears adherent to the bed of the wound.

The surface of the shiny lesion that can be confused with newly formed healthy epithelial tissue. There are signs and symptoms of subclinical infection.

Biofilms are protected foci of infection and bacterial resistance within the lesion and protect against the action of antimicrobial agents (antiseptics and antibiotics) Bacterial over-infection is an event that can inhibit or delay the healing of the wound or even cause a chronicization of the wound. Excellence therapy to counteract this complication utilizes topical use of Silver Micronized Sulfadiazine 1% cream, chemotherapy-antibiotic included on the list of 200 essential drugs approved by the World Health Organization published in March 2017 (WHO Model List Essential Medicines and WHO Model List of Essential Medicines for Children) and the AHRQ guidelines attribute the highest level of evidence (Level A evidence) to the topical treatment of infections supported by gram +, gram- and which can also be used in children from two months of age.

Study

We conducted a study : 104 patients were taken into consideration

including 60 women and 44 men with an age between 9 and 84 years old with difficult wounds.
 70 swabs were +staphylococcus
 34 swabs were +pseudomonas
 A control sample of 35 patients with well healing surgical wounds was also considered in this study.

Questions of our object of the study



Figure 1: Question 1 why if the swab is negative to pseudomonas if I apply AgSu the exudate becomes green or brown?



Figure 2: Question 2 Is it silver?



Figure 3: Question 3- Is it sulfadiazine?
With our study, we found the answers.

Method

During our research, we highlighted that 'AgSu' is an acronym that defines silver sulfadiazine on international search engines. AgSu is very useful in the management of infections and its antibacterial action derives from its ability to interfere with the hydrogen bond of DNA. Biochemical and metabolic evidence suggests that it acts on external cell structures, the decrease in the number of ribosomes reflects the degradation of ribonucleic acid that results from the effects of AgSu on the cell membrane.

Pseudomonas Aeruginosa is characterized by the production of soluble pigments: green-blue colored pyocyanin, reddish-brown pyorubine. More than 90% of the strains produce pyocyanin and an inversely proportional relationship exists between growth rates and pyocyanin production. The AgSu, as it comes into contact with the P.A., activates the fluorescein that gives it the fluorescence, immediately highlighting its concentration point, accelerating the diagnosis.

The P.A. lives and multiplies above $> 40^{\circ} \text{C}$, perhaps this is one of the reasons why it is not always immediately diagnostic with a culture swab. All lesions were cleansed with a lactate Ringer Solution and covered with a layer of 2-3 mm thick Silver Micronized Sulfadiazine 1% cream, then covered with breathable porous polyurethane foam (assisted by alginate in case of particularly exudative lesions) kept in place by polyurethane film. Renewal of the dressings for the lesions examined took place every 48 hours, until complete healing of all skin lesions occurred on the 15th day after taking charge. Its use has been fundamental in the prevention of wound colonization.

Results

After 10 seconds from the application of the 1% cream micronized Silver Sulfadiazine we noticed in vivo the escape of the pseudomonas from the deep layers to the surface of the wound, whose presence was not found in the diagnosis of the swab.

In both the cases described there was a noticeable improvement of the wound bed, a clear and significant reduction of inflammation, pain, biofilm and slough was observed, maintenance of hydration, tissue regeneratio. Important scientific evidence demonstrated in

its application in diagnosing the presence of pseudomonas on the wounds described, not detected with laboratory tests.

The mechanism of action of Silver Micronized Sulfadiazine 1% cream occurs with a double point of attack, as its components dissociate in contact with the exudate: the SSD has a drum mechanism, inhibits the formation of the bacterial wall interfering with the synthesis of folic acid by the microorganisms while the Silver Ion acts according to a bactericidal mechanism, penetrating inside the cell in the bacterial DNA and interfering with the transcription and replication processes.

Conclusion

The wounds taken care of and treated with this methodology have come to healing. Early treatment with 1% cream Micronized Silver Sulfadiazine resulted in a considerable reduction in infectious complications, reduction of the intensity of the pain, until their disappearance. The early and preventive treatment of injuries and secondary degeneration by Silver Micronized Sulfadiazine 1% cream resulted in a significant reduction in infectious complications with a favourable cost / effectiveness balance (reduction in the number of medications and materials and favourable outcomes) and improving the patient's quality of life with pain reduction.

Its topical use has inhibited microbial colonization and the incidence of superficial burn wound infections, the Silver released slowly from the formulation inhibits the growth of microorganisms and the Sulfadiazine is also active on some species of sulphonamide resistant bacteria. The double association guarantees a broad spectrum bactericidal effect with very rare resistance, it is indicated in all skin lesions, and it has a low cost and has no side effects.

It can be used "in the first instance" pending other tests and associated with other advanced or simple dressings. The Silver Micronized Sulfadiazine 1% cream has Simplicity of use, has scientific and clinical evidence for decades. Important information: it is unassailable from the medico-legal point of view and protects the operator who uses it.

We have highlighted how the 1% cream sulfadiazine argentica (SSD Ag 1%), a topical chemotherapy antibiotic, has been effective in the prevention and treatment of acute and chronic skin lesions infected and / or susceptible to super infection's.

The results obtained demonstrated an improvement in the quality of life of treated patients suffering from injuries. The use cream of the Silver Micronized Sulfadiazine 1% has proven to be fundamental for prophylaxis (to prevent the onset of infection in at risk ulcers) and for the treatment of wound infection, combining efficacy and tolerability [1-14].

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