

The Importance of Using ZOUSH Ointment in Burn Wound Infection Treatments

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Abstract

Background

Pseudomonas aeruginosa is an opportunistic bacteria which is one of the most important bacterial infection. As incidence of MDR and XDR strains were reported and antibiotic resistant is a global issue we research about new drug.

Materials and methods

Data about Iranian herbal medicine were obtained by searching databases. In this research we study about 50 papers of different databases.

Result

The result of our study indicated that ZOUSH ointment which is include herbal medicine such as *Satureja Khuzestanica*, *Zataria Multiflora*, *Mentha Mozaffariani Jamzad* can use for controlling burn wound infections.

Conclusion

ZOUSH ointment will be used as a common ointment for healing burn wound infections.

For the first time antibiotic uses in 1880-1940s has created tremendous advances in the pharmaceutical industry. Bacteria are single cell living organisms which exist everywhere (1). There are three groups of bacteria in the universe, Pathogen, non-pathogen and environmental bacteria. For those bacteria which are pathogens, we need antibiotics lead to inhibit their growth and their infections. Although antibiotic usage is very common nowadays, if antibiotics use more than specific dose, overdose of them leads to antibiotic resistance step by step (2), so previous antibiotic's dose couldn't be effective and more dosage is needed, after that we confront antibiotic resistance. Recently antibiotic resistance is a global issue. (3)

Pseudomonas aeruginosa is an opportunist, gram negative and bacillus bacteria, which is showed widely antibiotic resistance. Recently incidence of MDR and XDR strain were reported by researcher (4). Thus, in this study we search to find alternative ointment instead common ointment for healing wound infections.

Materials and Methods

The searching process was conducted for introduce new drug, ZOUSH ointment, for healing burn wound infections. We used Google Scholar, Science Direct, Web of Science, MEDLINE, PubMed, Scopus, Cochrane Library, and the Scientific Information Database. The original and review articles which are published in English and Persian were included in our research. The keywords such as *Satureja Khuzestanica*, *Zataria Multiflora*, *Mentha Mozaffariani Jamzad*, ointment, burn infection and *Pseudomonas aeruginosa* were been used for searching process. The same searching was done with similar strategies and related Persian keywords among Iranian databases.

We searched Magiran (www.Magiran.com), and Irandoc (www.irandoc.ac.ir), Scientific Information Database (www.sid.ir), Iranmedex (www.iranmedex.com).

Results

Plants have always been one of the main sources of drugs that are used traditionally or in the form of pure chemical products. According to the World Health Organization, about 80% of the world's population uses herbal medicines as part of their treatment. Iran with 11 different climates and more than 7500 plant species, is a very good base for obtaining valuable medicinal and rare species. Currently, 25% of the existing drugs have herbal sources, and 12% of the drugs are made from microbial sources. (5) *Satureja Khuzestanica*, *Zataria Multiflora*, *Mentha Mozaffariani Jamzad* are samples of these herbal medicine. (6)

Mahboubi and et al's research in 2015 showed that ethanol extract of *Satureja khuzistanica* has anti-candidal activity against clinical isolates of *C. albicans* (7) Esmaeili and et al's study indicated that *Satureja khuzistanica* can reduced the expression level of *exoS* gene in *Pseudomonas aeruginosa*.(8)

Jalalvandi, in her research showed that *Satureja khuzistanica* decreased the level of *mexA* and *mexR* genes in *Pseudomonas aeruginosa*.(9)

Dashipour and et al's research in 2015 showed that *Zataria Multiflora* could inhibit the growth of several bacteria such as *Pseudomonas aeruginosa*. (10)

Salarbashi and et al indicate antimicrobial effectiveness against gram positive and gram negative bacteria including *Pseudomonas aeruginosa*. (11).

Heidari and et al in 2016 demonstrated that *Z. multiflora* extracts had significant antibacterial effects on regular and IMP-producing *Pseudomonas aeruginosa* strains. (12)

The results of Arman and et al's research in 2013 indicated the *Mentha Mozaffariani* oil exhibited high antimicrobial activity against several gram positive and gram negative bacteria, according to the disk diffusion method and MIC values.(13)

Bekhechi and et al studied on antibacterial activity of *Mentha Mozaffariani* oil. This research showed that the oil was characterized by a high content of pulegone (79.5%) and it has antibacterial activity against nine bacteria stains such as *Pseudomonas aeruginosa*. (14)

Discussion

Burn is one of the most serious medical conditions, which affects whole physical and mental aspects, and is capable of infecting people of all ages.

Prevention of bacterial infection spread in hospital settings is difficult due to the intrinsic and acquired resistance of this bacterium to many antibiotics. Given the fact that the main way of controlling infection is the use of antibiotics, the emergence of MDR and XDR strains is a current worldwide problem. The prevalence of these strains is on the rise due to the antibiotic selective pressure and elevated dosage.

Despite many scientific advances in the treatment of burns, it remains one of the major public health problems around the world, especially in developing countries.

Achieving an effective and efficient method is needed for immediate treatment of these bacteria due to therapeutic dilemmas, drug resistance and high mortality due to *bacteria*. Traditional medicine plays an important role in the treatment and prevention of these bacteria.

Carvacrol is a major component of the *S. khuzestanica* extract, which inhibits the ATPase activity and increases the bacterial cell membrane permeability, and hence enhances the membrane permeability for antibacterial agents(1-6).

Conclusion

Our study indicated that herbal medicine such as *Satureja Khuzestanica*, *Zataria Multiflora*, *Mentha Mozaffariani* Jamzad can control infection of *Pseudomonas aeruginosa* in different way such as reducing level of different gene expression. Thus we can use these herbal medicine to produce an ointment which can healing burn wound infection. So we decided to formulation herbal ointment, ZOUSH, to control and healing burn infection with *Pseudomonas aeruginosa*.

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