

Antibiotics and Antibiotic Resistance

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Aloe Vera Gel Formulation for Wound Dressing: Comparison of Different Polymers using Factorial 2³ Design

Human skin is known to be the most fragile and sensitive part of the body, it covers entire body, and has various functions in regulating the body temperature and providing a shield against microorganisms such as bacteria. Different topical preparations containing antibacterial for treatment wound infection are available in market. Antibiotics are highly effective in wound healing, however their side effects such as irritation and skin allergy reaction are troublesome to the body and if absorbed it will cause systemic side effect. These drawbacks could be avoided if the therapy was switched from synthetic to a natural active ingredient like the plant *Aloe Vera*. A promising, but still an underrated group of potential antibacterial agents that can be integrated into wound dressings are known as natural products, especially plant like *Aloe vera* which help to switch from chemical to natural product treatment. Leaves of this plant are green resembles with cactus leaves filled with a clear gel like fluid, which is viscous in nature. It can be used alternative for minor sunburn and cosmetics. It has been demonstrated that *Aloe vera* has UV protective, anti-inflammatory, and wound healing properties.

Topical gel provides a localized drug delivery for rectal, vagina, skin disease and wound. The drug loading to gel is able to overcome all the issue in wound healing. The efficacy of these gels is dependent on factors like viscosity, pH, homogeneity, drug contents, drug release, and permeation to the skin and antibacterial activity which will be further studied. The formulating gels with different polymers using factorial 2³ designs and investigating the effect of *Aloe vera* serving as effective gel base on acceleration the healing of the infected wound. It also has potential increase the bioavailability of co-administered compounds and as absorption enhancement. Fusidic acid, a steroidal antibiotic employed for treatment of primary and secondary topical infections. Fusidic acid was explored as a promising strategy toward combating resistant bacteria in wound infection sites.

In the present research work, the central parenchymal portion of *Aloe Vera* will be formulated into a gel using hydroxyl propyl methyl cellulose (HPMC), carboxyl methyl cellulose (CMC), and Carbopol 934

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as a gelling agent. Antibacterial (Fusidic acid) will be incorporated into the prepared *Aloe Vera* gel and will be evaluated for viscosity, pH, drug content, and *in vitro* drug release. Its effect will be evaluated the enhancement in the release of drug. The results will be compared with that of a commercial Fusidic acid ointment.

Biography

Nida'a M. A. Wadi is a register pharmacist for more than 30 years. She is Assistant lecturer at (NUST, National University of Science and Technology (formally named Oman medical College). She has practiced as lecturer in Medical College and Sr. lecturer Pharmacy College for several years. She has many contributions as speaker, poster presenter as well as published some articles. She teaches in the graduate pharmacy program different pharmacy subjects and she is chairperson of training program for national and international training coordinator with West Virginia pharmacy college, USA & JSS India. Her interest of research on antibiotic delivery system and formulation and evaluation of local delivery system.