

عنوان مقاله:

Fabrication and design of smart bandage for monitoring and treatment of chronic wounds with online monitoring of temperature, humidity and pH

محل انتشار:

چهارمین کنگره بین المللی و ششمین کنگره ملی زخم و ترمیم بافت (سال: 1398)

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خلاصه مقاله:

The skin is the largest organ in the body and protects the internal organs against external physical and chemical substances. Skin injuries caused by trauma, surgery, diabetes, or burns can lead to scarring and endanger catastrophic integrity and protective functions of the skin. Wound management is a major global challenge and wound healing is influenced by intrinsic and extrinsic factors, so monitoring different physiological parameters is essential. Since conventional wound dress lack of potential diagnostic, recent developments in wound management have shifted to smart wound dress. Currently, none of the wounds on the market can intelligently determine the clinical conditions of the wound, such as temperature, humidity, pH, for the physician, and since these factors are highly influential on the wound healing process, these factors can accelerate the wound healing. The process of wound healing, antibiotic therapy, lack of hospitalization, monitoring of the wound by a remote physician can reduced patient comfort and reduced treatment costs. Chitosan as a natural polysaccharide and titanium nanoparticles are among the substances that are considered as a drug and antibacterial biomaterials in smart wound dress with suitable properties. On the other hand, visibility of the wound cite is an important advantage because it enables the physician to have optimal control over the wound healing process, so that this wound can be treated with gelatin as a transparent and biocompatible material. It allowed the wound to be observed. In this regard, with the help of composite science and the use of freezing drying (FD) method, a novel wound dress can be produced in which can provides all these benefits to the patient and physician. In this study, using materials such as gelatin, carboxymethyl chitosan powder, PVA, titanium nanoparticles, acetic acid, and the use of new stable homogenization technique and freezing dryer were fabricated. The purpose of this study was to fabricate a flexible wound dress from biocompatible materials that would operate intelligently by temperature, pH and humidity sensors. This wound-healing function helps the doctor to consider the three most effective parameters (temperature, humidity and pH) during healing, choosing the best treatment at the earliest time. The pH-sensitive particles of the wound scaffold and the use of calorimetrically can monitor the pH of the wound as the pH may recognized as a relevant wound healing factor. Therefore, routine ... monitoring of wound pH can be a promising method for wound treatment and act as effective

کلمات کلیدی:

Smart bandage, Sensor, Wounds, Biocompatibility, Wound healing, Patient Care

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