UNIVERSITI TEKNOLOGI MARA

PECTIN-CHITOSAN FILM AS WOUND PROTECTANT

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ABSTRACT

PECTIN-CHITOSAN FILM AS WOUND PROTECTANT

In this study, pectin-chitosan bilayer film was used to protect the minor wounds of the patient with adequate adhesiveness and could withstand physical exertion. The pectin layer acted as adhesive due to its water absorptive nature and the chitosan layer acted as protectant layer with its non-water absorptive nature, providing barrier to water during shower activities. Five formulations of the film were made which were pectin film which acted as the control, pectin-0.5% chitosan film, pectin-1.0% chitosan film, pectin-1.5% chitosan film and pectin-2.0% chitosan film. The films were evaluated by thickness test, surface morphology test, stickiness and peelability test, wetting and swelling test, folding endurance test, and tensile strength and extensibility test. Pectin-1.5% chitosan film was the thickest matrix among all films. Pectin-2.0% chitosan film exhibited the highest grittiness, most brittle due to the presence of pores on the surface of the film. It swelled until it folded into a roll and had the highest tensile strength. Pectin with no chitosan exhibited the highest folding endurance and the highest extensibility. Depending on the nature of stress, films with low chitosan content are deemed suitable when folding stress exists, whereas films with high chitosan contents are appropriate for use under tensile stress.

CHAPTER 1

INTRODUCTION

1.1. Background of study

Conventionally, people treat minor wounds by letting the wound to dry and form a scab by itself. However, due to advancing technologies, wound treatment has undergone many significant changes. One of these changes is the use of artificial dressings to cover the wound. According to Baie, Febriyenti and Mohd. Noor (2008), this artificial dressing stimulates the epidermis to heal faster by maintaining the wound's humidity.

Most of the wound dressings used today for example plasters and bandages may result in pain and discomfort to the patients during the process of the wound dressing and dressing removal because of their adhesive nature. Furthermore, the dressing may not be tightly adhered to the wound site and susceptible to physical changes upon contact with the external stimuli such as water. However, this can be minimized and possibly eliminated by spraying a dressing concentrate that will form a seal on the wound (Baie et al., 2008). Through appropriate material selection in wound dressing design, the patient will have no problem if he or she wants to take a shower or involves in any activities that will cause a contact between the wound and the external environment.

1.2. Problem statement

The aim of wound healing process is to ensure both the healing of the wound and skin repair processes occur as fast as possible. Generally, nowadays both of these processes are assisted by many types of wound dressing available in the market.