UNIVERSITI TEKNOLOGI MARA

THE PERMEABILITY OF ACETAMINOPHEN LOADED CHITOSAN FILM FOR TRANSDERMAL DRUG DELIVERY

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ABSTRACT

Chitosan, a natural derivative of chitin serves as multipurpose polymer and shows mucoadhesion and permeation enhancement properties for both oral and transdermal drug delivery systems. This study clearly confirmed that the selection of suitable concentration of chitosan do alter the drug permeation profile. The percentage of cumulative drug permeation was found to be 1.82±0.17%, 6.10±1.11% and 0.72±0.37% for the formulations 2, 3 and 4% w/w of chitosan concentration respectively. Chitosan with 3% w/w concentration showed the highest drug permeation profile at 6.10±1.11% after 24 hours in contrast to other formulations of 2 and 4% w/w. In conclusion, chitosan is potentially suitable for use as a transdermal film carrying acetaminophen, $p < 0.05$.

CHAPTER ONE

INTRODUCTION

1.1 Background of study

A transdermal patch is an adhesive patch that contains medication that applied on top of the skin to deliver the drug with specific dose [1-2]. Transdermal patch has main designs include matrix system and reservoir [3]. These designs provide controlled, constant dose of medication administration as well as constant administration of drugs with short half-lives and eliminates the drug entry into the systemic circulation that often causes undesirable side effects such as nausea, vomiting and diarrhea [4].

Transdermal drug delivery system (TDDS) offers several advantages such as eliminating the interference occur in the gastrointestinal absorption that caused by the gastric juice, activity of enzyme, drug- drug interactions and interaction of drugs with food or drink. TDDS is an alternative route for oral administration when the oral route is insignificant with patient having diarrhea, vomiting and when the medication is not palatable for them [5]. By avoiding the first pass effect, TDDS protect the drugs from being deactivated by digestive or liver enzymes [6]. These benefits of TDDS offer great opportunities for pediatric population as it is non-invasive route of administration. It is an optional administration of medication to oral and intravenous