



Formulation and Evaluation of Fast-Dissolving Films of Minoxidil

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Abstract

The exploration of FDFs as a cutting-edge method of medication administration addresses the limitations of traditional dosage forms, offering a promising alternative, particularly for those who struggle to swallow, like children, the elderly, and individuals with dysphagia. This research is centered on developing and accessing FDFs containing a particular antihypertensive medication to increase patient compliance and improve treatment results. The aim is to formulate a fast-dissolving film through a casting technique and to analyze its mechanical and physical characteristics, bioavailability, homogeneity of drug content, and stability under various conditions.

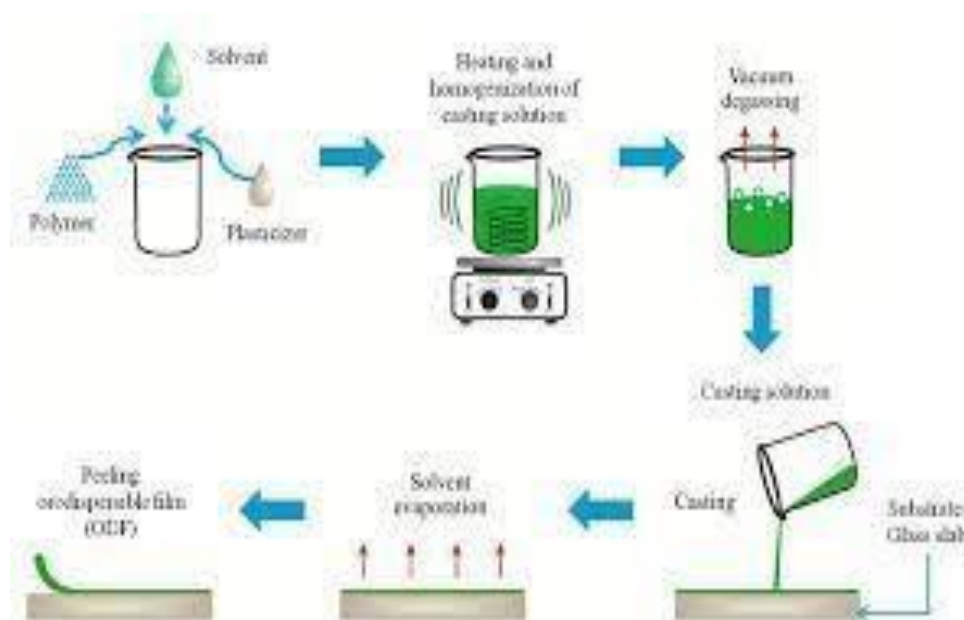
Keywords: Exploration; cutting-edge method; dysphagia

Introduction

Oral Films: These are thin strips loaded with medicament and formulated with the help of a water-soluble polymer and these are a progress in medication delivery. The thin, flexible films dissolve in saliva, displacing the medication into the blood. These are a substitute for tablets difficult to swallow for children and elderly people and an improved version of patches. There are various Oral Films. **Precise dosing:** The drug wastage is much less as it

However, chronic nasal administration can cause inflammation and nasal tissue damage to mucosa, and variability in mucosa secretion can affect drug absorption.

While rectal, vaginal, and ocular routes have advantages, they suffer from



directly enters the bloodstream.

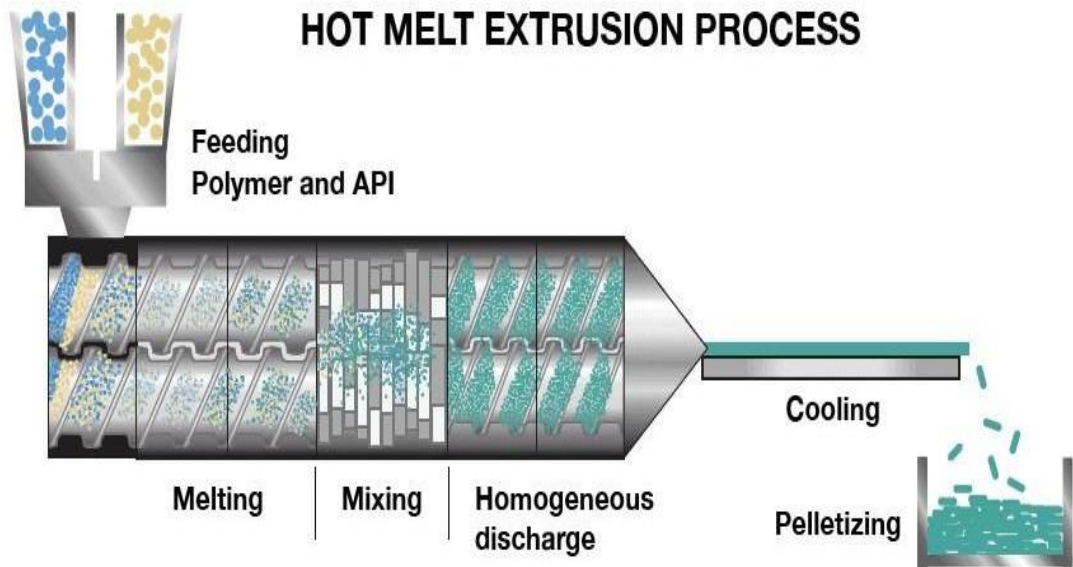
Figure 1.1: Solvent casting technique

simple to administer and also patient-friendly, the major drawback of this route is that it undergoes first-pass metabolism which results in drug loss. The nasal route has been explored for drug delivery, with some drugs like LHRH and calcitonin already available on the market.

poor patient acceptability. In contrast, this route is well-accepted by patients, it has high permeability, a high blood supply, and enables medications to avoid the first-pass metabolism. Drug delivery through is categorized into sublingual [under the tongue], buccal [cheek lining], and local delivery. [2].



Figure 1.2:



The oral route is the first choice for traditional drug delivery because it is simple to administer and also patient-friendly, the major drawback of this route is that it undergoes first-pass metabolism which results in drug loss. The nasal route has been explored for drug delivery, with some drugs like LHRH and calcitonin already available on the market. However, chronic

nasal administration can cause inflammation and nasal tissue damage to mucosa, and variability in mucosa secretion can affect drug absorption. While rectal, vaginal, and ocular routes have advantages, they suffer from poor patient acceptability. In contrast, this route is well-accepted by patients, it has high permeability, a high bold supply, and enables medications to avoid the first-pass metabolism. Drug delivery through is is categorized into sublingual [under the tongue], buccal [cheek lining], and local delivery. [2].

Oral mucosa
Overview of the Mucosa

Table Formulation table [F1-F3]

S/no.	Ingredients	F1	F2	F3
1	Minoxidil (mg)	97	97	97
2	Sodium Alginate (mg)	300	350	400
3	Glycerol (ml)	125	125	125
4	Croscarmellose sodium (ml)	125	125	125
5	Saccharin (mg)	30	30	30
6	Citric acid (mg)	20	20	20
7	Orange oil (ml)	q/s	q/s	q/s
8	Water (ml)	q/s	q/s	q/s
9	Ethanol (ml)	4	4	4



Figure: Zero-order kinetics

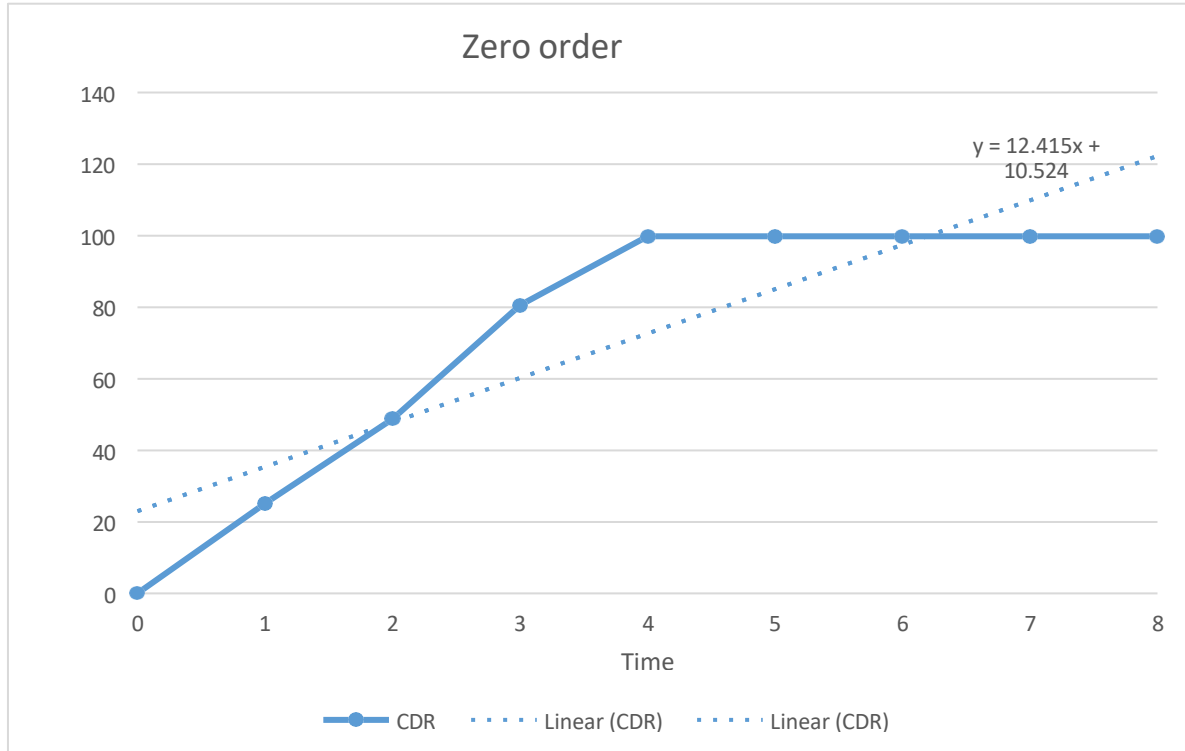


Figure: First-order kinetics

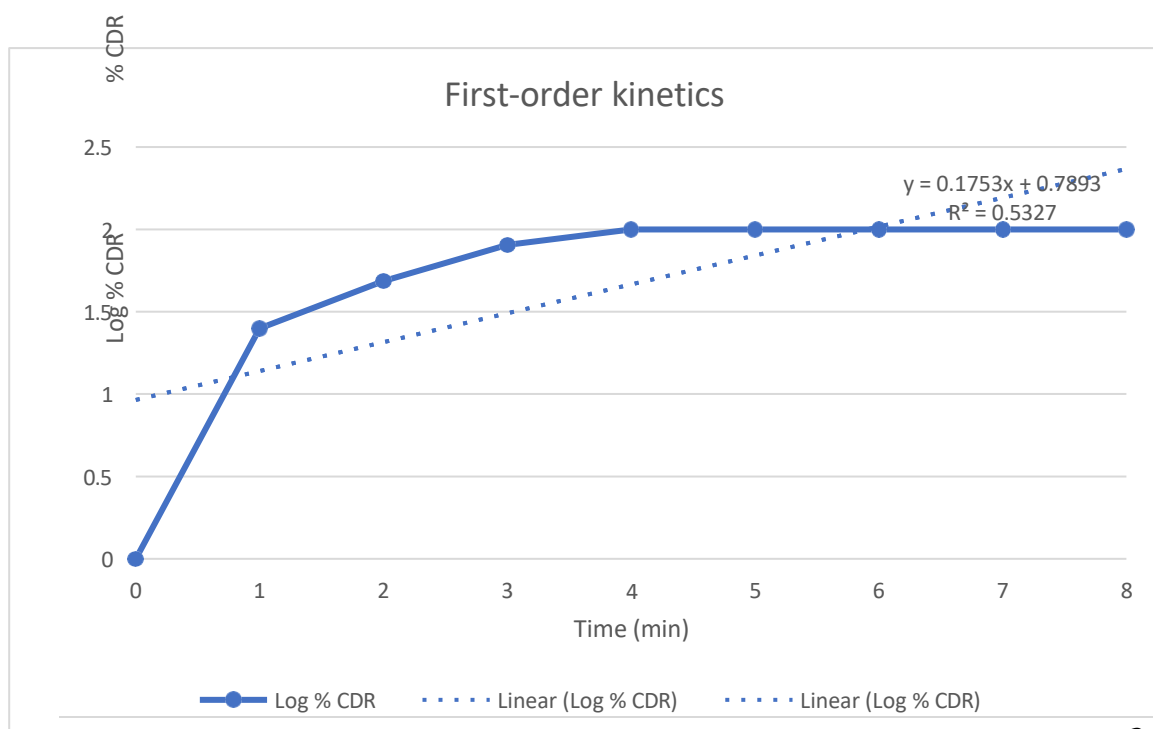
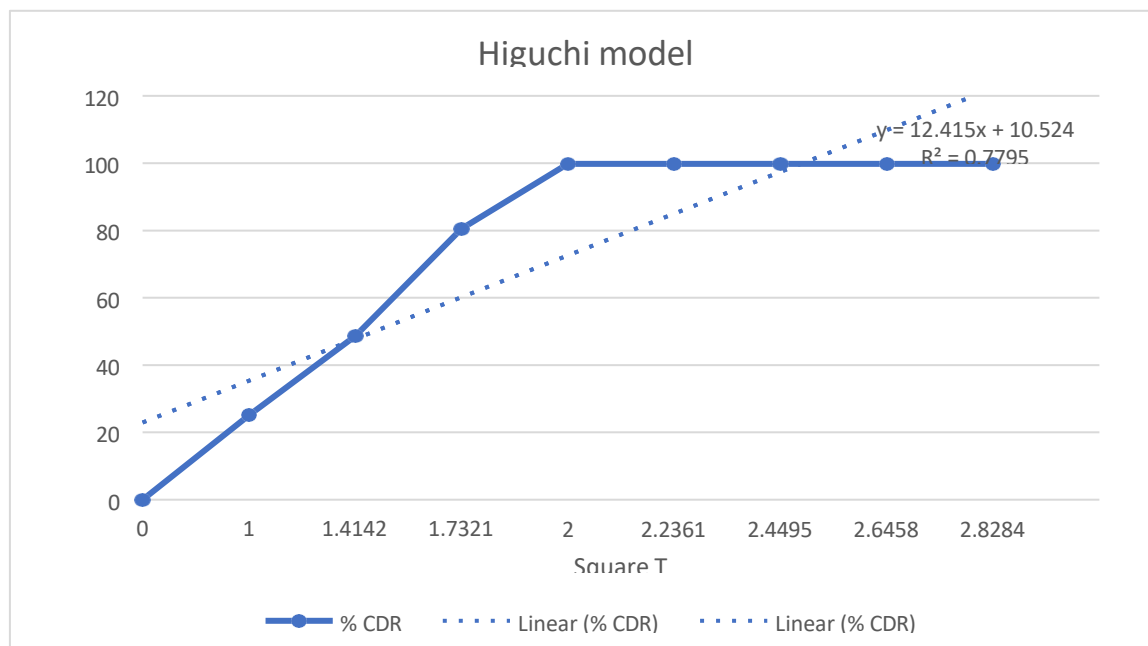




Figure: Higuchi model



Summary and Conclusion

This thesis work was an attempt to the problems caused by tablets and capsules which are not ideal for every patient especially those with difficulty swallowing. The problems encountered are attempted to solve by developing fast-dissolving films. The FDFs are thin strips loaded with drugs and formulated in a way that they dissolve in seconds in saliva observing the drug into the bloodstream. The site of absorption for the films is the mucosa, so the drug avoids the hepatic first-pass effect enhancing the bioavailability. The Fast-dissolving film of minoxidil an anti-hypertensive drug was prepared by solvent casting technique using alginate and HPMCK100 as film-forming polymers. The major aspects in developing the fast-dissolving film were polymer and solvent selection, incorporation of the API, and casting process. The study also included physicochemical characterization studies like physical appearance, thickness measurement, weight variation, folding endurance, drug content, surface pH, and in-vitro studies.

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