INTRODUCTION ON CHEWABLE TABLETS

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Introduction

In ODDS chewable tablets are advanced formulation for the patients acceptance the chewable tablets are allow to broken and chewed in b/w the teeth &before ingestion. These used for the children's and old aged peoples when swallowing is very difficult the tablets are easily disintegrated in mouth and shows the quick action it has pleasant & flavorable taste no bitter texture. Chewable tablets act in a localized manner than systemically. These are palatable maybe chewed & ingested with little or no water.

Chewable tablets are usually chewed in the oral cavity to swallowing & not expected to swallow intact. Main purpose is proper unit dosage form of medicaments which can easily administer.

Wherever reasonable and useful, in the step_1st of chewable tablets formulation having complete profile of active. This leads to the most competent formulation of a steady product of drug usually prepared by diluents, flavors, sweeteners and other medicaments. All these trails are depending on production section as the parameters have been found during expansion. Chewing tablet dosage form, are particularly those which containing pharmaceutically pro agents. The formulated medicaments & manufacturing procedure both are plays a vital role.

METHOD OF CHEWABLE TABLET PREPARATION:[15]

There are 3 general methods of tablet preparation.

A. Non aqueous Granulation

B. Aqueous Granulation

C. Direct compression.

LITERATURE REVIEW

Formulation and Evaluation of Chewable Tablets of Loratadine by Direct Compression Method Since last few years, there has been an enhanced demand for more patient compliance dosage forms. For this an attempt has been made in the present work to design and evaluate chewable tablets. Chewable tablets have the advantages of both conventional tablet and liquid dosage formulation, especially in geriatric and pediatric. Oral route of administration has received more attention in the pharmaceutical field. Chewable dosage forms have been demonstrated to improve therapeutic efficacy and better bioavailability.

Formulation design & evaluation of chewable tablet of albendazole by different methods Albendazole is a benzimidazole derivative with broad spectrum anthelmenthic activity and excellent tolerability. Orally it is rapidly

absorbed and metabolized to sulfoxide and sulfone, which may be responsible for its anthelmenthic action. Single dose administration of albendazole has produced cure rates in ascarisis, hookworm and enterobiasis which are comparable to three day treatment with mebendazole.

AIM AND OBJECTIVE

OBJECTIVE:-

Formulation & evaluation of chewable Darunavir tablets to get improved bio-availability of drug.

AIM:-Aim of present project work is

By using the FTIR to known the drug & medicaments suitability studies by proper methods.

By using disintigrants to prepare chewable tablets.

To estimate the arranged chewable tablets.

To achieve stability studies.

PLAN OF WORK

- **Pre-formulation studies**

description of API

Solubility of API

Drug & Excipient suitability studies

Construction of caliberation curve

Formulation Development

Evaluation of Tablets

- Thickness
- Hardness
- Disintegration test
- % Friability
- % Weight variation
- Content uniformity
- Invitro dissolution test.

- **Stability studies** (at 30ºC / 75 % RH and 40ºC / 75 % RH)

MATERIALS USED

List of materials

S.No	Name of the ingredients	Suppliers
1	Darunavir	Chandra labs, Hyd
2	Magnesium stearate	Drug India Pvt.Ltd
3	Mannitol	STANDARD REAGENTS
4	Pregelatinised starch	STANDARD REAGENTS
5	Micro crystalline cellulose	Drug India Pvt.Ltd
6	Croscarmellose sodium	STANDARD REAGENTS
7	Crospovidone	S.D fine chemicals
8	Aerosil	Drug India Pvt.Ltd

9	Purified water	Chandra labs, Hyd

List of Equipments

S. No.	Equipment	Manufacturer
1	Digital Balance	Mettler Toledo
2	Sieves	Scientific Engineering co. Ltd.
3	Tap density Tester	DBK
5	Laboratory Stirrer	Remi
6	Tray dryer	Thermo electonic labs
7	pH Meter	Digisun electronics system
8	Dissolution test apparatus	Lab india
9	Stability chambers	Thermo electonic labs
10	Disintegration Tester	DBK
11	Hardness tester	Pfizer
12	Friabilator	DBK
13	20 Station Compression machine	CLIT
14	Digital Vernier	Electro lab
16	FTIR	PerkinElmer

METHODOLOGY

RATIONALE FOR DRUG SELECTION

Mainly the absorption pattern, solubility and biological half life may play a vital role in describing the rationale for selection of drug. Darunavir it is a protease inhibitor drug used to treat HIV infection.

Darunavir Prezista is an ORAC recommended treatment option for HIV experienced adults and adolescents. Developed by pharmaceutical company Tibotec, darunavir is named after Arun K. Ghosh, the chemistry professor who discovered the molecule at the University of Illinois at Chicago.

PREFORMULATION STUDIES

Prodrug ingredient (API) categorization:- Organoleptic evaluation:-it contains 3 types

a) Color
b) Odour
c) Taste

Preparation of Calibration Curve of Darunavir in 0.1N HCl

Procedure: 100 mg of Darunavir was weighed & dissolved in 20ml of water & make upto 100ml mark in Vf then the solution gets 1000 µg/ml conc'n.

The std solution of Darunavir was diluted with 0.1N Hcl to obtain a sequence of dilutions containing 10, 20, 30, 40, and 50 µg/ml. The absorbance of dilutions was measured on a spectrophotometer at 210nm. The concentration of Darunavir used and the corresponding absorbance is given in table.

Calibration curve of Darunavir API in 6.8 Ph phosphate buffer

Procedure: weigh 100 mg of Darunavir & placed into 100 ml of Vf & dissolved with 0.1N Hcl then stock solution gives 1 mg/ml. 1 ml was withdrow from ss-1 in another Vf and diluted up to 10 ml to give a stock solution 100 µg/ml. Further dilutions were made from 10-50 µg/ml 0.1N Hcl and absorbance was measured at 210 nm.

DRUG AND EXCIPIENTS COMPATIBILITY STUDY:

The selection of excipients was based on the prior experience; excipients listed by the innovator in the package insert (Micardis) tablets. Compatibility was observed with excipients with Darunavir.

FORMULATION DEVELOPMENT [20][2009]

- The aim of the formulations was to develop a bioequivalent product with respect to reference product with similar physical, chemical characteristics and similar stability profile.
- The Reference product has Microcrystalline cellulose, Crospovidone, Colloidal anhydrous silica, Magnesium stearate, Hypromellose, Yellow iron oxide -160mg Tablets.
- From the basic literature search, excipients compatibility study and patent, under lying following excipients were selected to initiate the development work.

FORMULATION DEVELOPMENT

Table no : Formulation table

INGREDIENTS (mg)	FORMULATION CODE								
INTRA GRANULAR									
	CT1	CT2	CT3	CT4	CT5	CT6	CT7	CT8	CT9
API	300	300	300	300	300	300	300	300	300
CP (%)	2.5	3.75	5	6.25	-	-	-	-	-
CCS (%)	-	-	-	-	2.5	3.75	5	5	5
MCC PH 101	qs	qs	qs	qs	qs	qs	qs	qs	qs
Mannitol	30	30	30	30	30	30	30	30	30
starch	25	25	25	25	25	25	25	13	19.4
EXTRA GRANULAR									
MCC PH 102	20	20	20	20	20	20	20	20	20
CP	2.5	3.75	5	6.25	-	-	-	-	-
CCS	-	-	-	-	2.5	3.75	5	5	5
Mg.stearate	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37	1.37
Aerosil	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75	2.75
Total weight(mg)	550	550	550	550	550	550	550	550	550

RESULTS & DISCUSSIONS

PREFORMULATION STUDY:

A. Organoleptic Properties (Color, odor, taste and appearance)

Parameter	Drug
Color	White to pale yellow colour
Appearance	Hygroscopic soid

Melting point :Darunavir

Table 6.2 Melting point

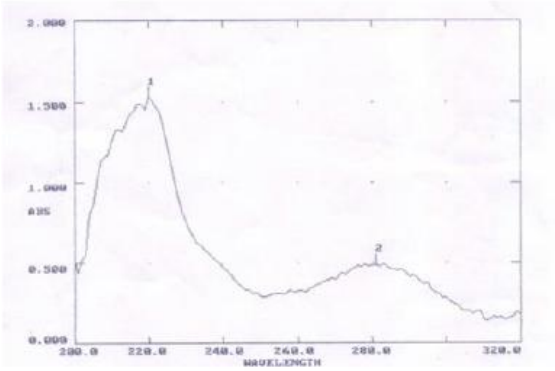
Reported Melting Point	Observed Melting Point
74 – 76^{0}c	76^{0}c

Determination of solubility:

In Soluble in water, freely soluble in dichloromethane, & methylbenzene

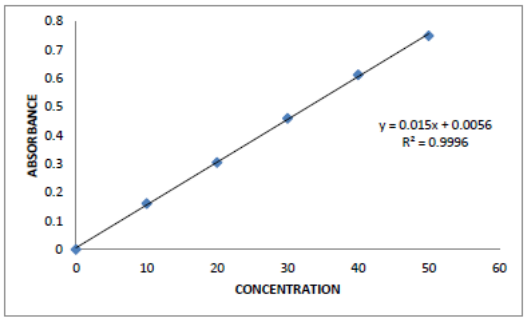
UV-Spectroscopy -

Drug sample shows lambda max. absorption (λ-max) 220 nm.

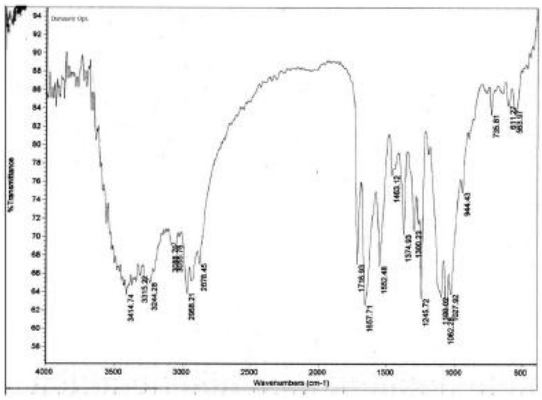


wavelength of darunavir 220nm

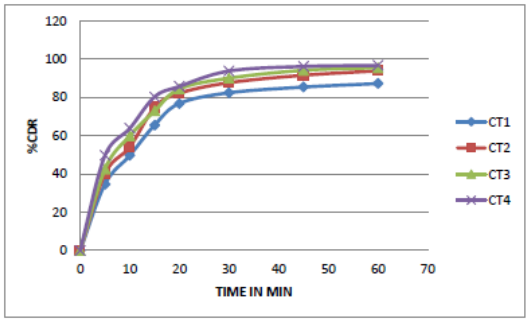
Calibration curve of Darunavir(API) in 0.1N HCL: Wavelength of maximum absorption: 220 nm.



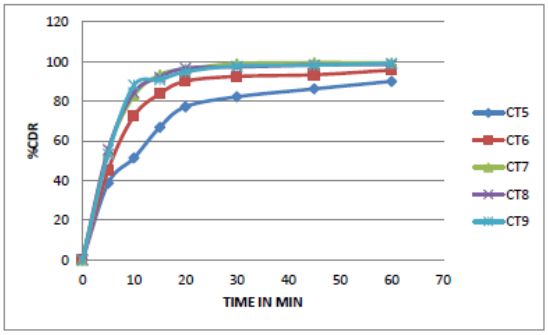
std curve of Darunavir in pH 0.1N HCl buffer



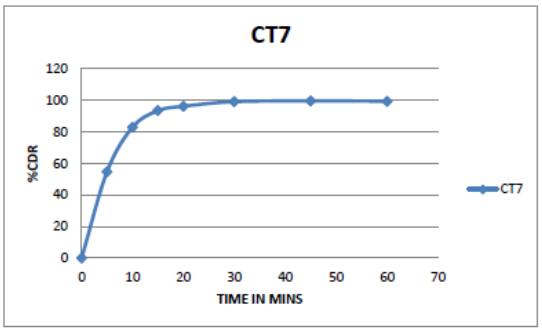
FT-IR spectra of Darunavir with excipients



%CDR for CT1-CT4 formulati



%CDR for CT5-CT9 formulations



% CDR for CT7formulations

SUMMARY:

An oral administration dosage form is the more preferable pharmaceutical dosage forms because of its easy of intake. Antiretroviral medication can prolong the time between HIV infection and the onset of AIDS and hence reduces both the mortality and the morbidity of HIV infection. The present study was aimed to formulate and evaluate chewable Darunavir tablets byusing wet granulation using CCS, CP, are act as a super disintegrants.

For all the formulated Darunavir tablets to conduct all evaluations. The friability of thetablet acceptable range should be within the value 1%.

All formulations had shown acceptable hardness, weight variation, friability, disintegration values.

The selection of better formula was done based on dissolution results.

- CT1, CT2, CT3 and CT4 formulations prepared by using CP in different conc'n of 1%, 1.5%, 2%, 2.5%. Among these CT4 formulation showed max. Drug liberates 96.72±0.95 within 1 hr.
- CT5, CT6, CT7 formulations prepared by using CCS in different conc'n of 1%, 1.5%, 2%. Among these CT7 formulation showed max. drug liberate 99.25±0.31 within 1hr.
- CT8 and CT9 formulations prepared by using CCS by taking same 2% concentration which showed max. drug discharge, bt the amount of binder was changed to know the effect of binder concentration on drug release.
- CT8 and CT9 formulations which showed similar drug release as CT7 formulation.
- By the above results CT7 was considered as best formulation.

CONCLUSION

Based on the results CT 7 formulation was selected as a better one based upon the cumulative drug release. Wet granulation method was prepared by using 2% Cros Carmellose Sodium as disintegrant. The drug release for the above formulation has shown good release compared to that of the other formulations. Total drug was released within 1 hr indicating faster arrival of therapeutic action.

FUTURE SCOPE

The present work can be extended to formulate and evaluate Darunavir chewable tablets by using various other super disintegrants and also can by changing other binding agents and changing their concentration to know the effect of their concentrations on the performance of the Darunavir chewable tablets.

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4. ***Y. Phalguna et al.,in 2014*** *prepared montelukast sod. Chewable tablets using Dry granulation.*

5. *www.drugbank.ca/drugs/Darunavir*.