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Research Article

Formulation and Development of Mucoadhesive Tablets of Lamivudine Using Direct Compression Technique

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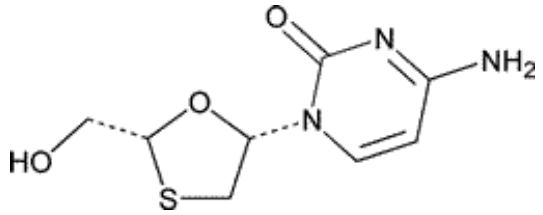
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ABSTRACT

The objective of the present work is to design mucoadhesive tablets of lamivudine for oral controlled release by direct compression using different binders. Lamivudine is anti viral drug used in the treatment of hepatitis B and HIV infections. It has a shorter half-life of 2-6 hrs, oral availability is 86% and it is eliminated rapidly from the plasma compartment within few hours. So, frequent administration is necessary to maintain its therapeutic concentration. In order to maintain the therapeutic concentrations of lamivudine modified release formulations are necessary. In the present work the mucoadhesive tablets of lamivudine was prepared to prolong the residence time at the site of application (or) absorption and to facilitate the intimate contact with the underlying absorption surface to improve and enhance the bioavailability. The mucoadhesive tablets of lamivudine were prepared by using Carbopol, Hydroxy propyl methylcellulose, xanthan gum.

INTRODUCTION:



Lamivudine (2 (1H)-Pyrimidinone, 4-amino-1-[2-(hydroxymethyl)-1,3-oxathiolan-5-yl]-, (2R-cis)-. (–)-1-[(2R, 5S) -2-(Hydroxymethyl)-1,3-oxathiolan-5-yl]cytosine.) is a white to off-white crystalline solid with a solubility of approximately 70 mg/mL in water at 20°C. Lamivudine is anti viral drug used in the treatment of hepatitis B and HIV infections.

It has a shorter half-life of 2-6 hrs, oral availability is 86% and it is eliminated rapidly from the plasma compartment within few hours. Prescribed dose is 300 mg daily, administered as either 150 mg twice daily or 300 mg once daily. Lactic acidosis and severe

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hepatomegaly with steatosis,Hepatic decompensation in patients co-infected with HIV-1 and Hepatitis C, Pancreatitis are side effect of Lamivudine.

MUCOADHESIVE DRUG DELIVERY SYSTEMS

Mucoadhesive drug delivery systems prolong the residency time of the dosage form at the site of application or absorption and facilitate an intimate contact of the dosage form with the underlying absorption surface and thus contribute to improved and/or better therapeutic performance of drugs. The potential site for attachment of any bioadhesive system or mucoadhesive systems includes buccal, oral, vaginal, rectal, nasal and ocular sites as these contain the mucosal lining layer.[2,3] The term bioadhesion refers to any bond formed between two biological surfaces or a bond between a biological and a systematic surface. In the case of bio adhesive drug delivery systems, the term bioadhesion is typically used to describe the adhesion between polymers, either synthetic or natural, and soft tissue (i.e., gastrointestinal mucosa). Although the target of many bio adhesive delivery systems may be a soft tissue cell layer (i.e., epithelial cells), the actual adhesive bond may form with either the cell layer, or a mucous layer, or a combination of the two. In instances in which bonds form between mucus and polymer, the term mucoadhesion is used synonymously with bioadhesion. In general, bioadhesion is an all-inclusive term used to describe adhesive interactions with any biological or biologically derived substance, and mucoadhesion is used only when describing a bond involving mucus or a mucosal surface.

Mechanisms of BIOADHESION:[3]

The mechanisms responsible for the formation of boiadhesive bonds are not completely clear. In order to develop ideal bioadhesive drug delivery systems, it is important to describe and understand the forces that are responsible for adhesive bond formation. Most research has focused on analyzing bioadhesive interactions between polymer hydro gels and soft tissue. The process involved in the formation of such bioadhesive bonds has been described in three steps:

Wetting and swelling of polymer to permit intimate contact with biological tissue,

Interpenetration of bioadhesive polymer chains and entanglement of polymer and mucin chains, and

Formation of week chemical bonds between entangled chains.

MUCOADHESIVE POLYMERS

Mucoadhesive polymers are water insoluble and water soluble polymers which are swellable networks joined by cross- linking agents .The polymer should possess optimal polarity to make sure that it is sufficiently wetted by the mucus and optimal fluidity that permits the mutual adsorption and interpenetration of polymer and mucus to take place. An ideal polymer for a mucoadhesive drug delivery system should have non toxic, non-irritant and non absorbable from the gastrointestinal tract. And it should adhere quickly to moist tissue and should possess some site specificity. The polymer should allow easy incorporation of the drug and must not decompose on storage or during shelf- life of the dosage form. And it should preferably form a strong non covalent bond with the mucin epithelial cell surfaces.

MATERIALS AND METHODS:

Construction of Standard Curve of Lamivudine: lamivudine can be estimated spectrometrically at 270 nm as it obeys beer- lambert's law. Stock solution is 100mg of lamivudine was dissolved in 100ml of 0.1 n hcl, so as to get a solution 1000 µg/ml concentration.

Standard solution: 10ml of stock solution was made to 100ml with 0.1 N Hcl thus giving a concentration of 100 µg/ml. Aliquot of standard drug solution ranging from 4ml to 24 ml were transferred in to 10ml volumetric flask and were diluted up to the mark with 0.1 N Hcl. Thus the final concentration ranges from 4-24 µg/ml. Absorbance of each solution was measured at 270 nm against 0.1 N Hcl as a blank. A plot of concentrations of drug versus absorbance was plotted.

Table None: 01 Standard Curve of Lamivudine in 0.1 N Hcl

S No	Concentration (mcg/ml)	Absorbance at 270 nm
1	0	0.000
2	4	0.060
3	8	0.103
4	12	0.160
5	16	0.216
6	20	0.267
7	24	0.307

***Slope* : 0.0129, *Regression* : 0.9989**

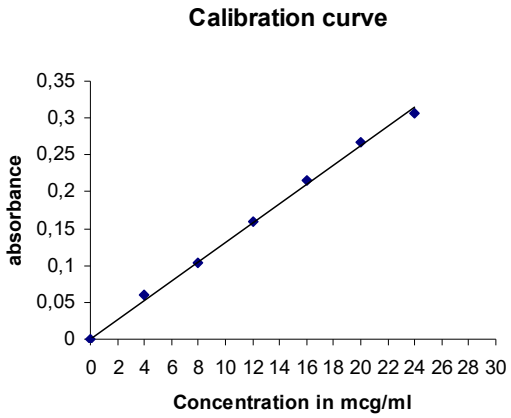


Figure None: 01

Compatibility study[24]:

The drug was identified and confirmed by FTIR spectrum. Fig 02 showed the IR spectrum of lamivudine .Fig 03 and Fig 04 shows the IR spectrum of the polymer Ethylcellulose and Hydroxy propyl methylcellulose respectively. . Fig 03 shows the IR spectrum of the physical mixture of Carbopol, hydroxy propyl methylcellulose, xanthan gum and the drug lamivudine.From the Fig 13 it was concluded that the drug along with the polymer showed no change in any characteristic peak of the drug, which confirms that there is no interaction between the drug and the polymer.

Figure None: 02 FTIR (KBr) Spectrum of Lamivudine (Pure Drug)

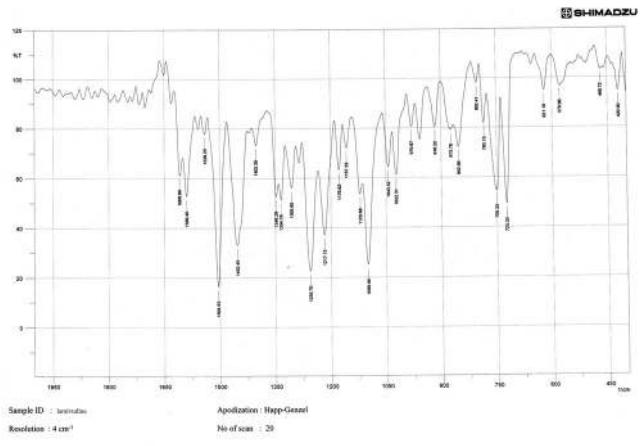


Figure None: 03 *FTIR (KBr)SPECTRUM OF HYDROXY PROPYL METHYLCELLULOSE*

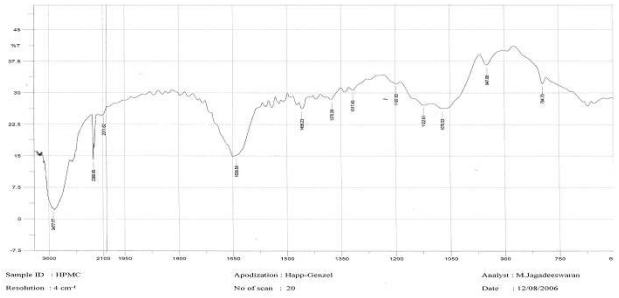
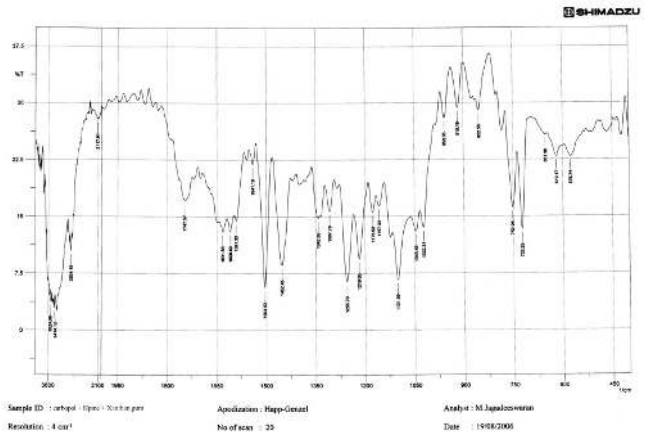


Figure None: 04 Spectrum of Physical Mixture for Xanthan GUM, HPMC and Lamivudine



PREPARATION OF TABLETS [10]

Mucoadhesive l tablets containing lamivudine were prepared by direct compression method. The ingredients of the core layer (Table No: 02) were weighed accurately and mixed by trituration in a glass mortor & pestle. The mix was then compressed using 8mm die by a tablet press. In order to obtain constant tablet weight the spray dried lactose was added as filler excipient in the core layer. After compression of tablet the upper punch was removed carefully with out disturbing the set up and mixed ingredients of the backing layer were added over the tablet and compressed again.

Table None: 02 Composition of Formulations of Mucoadhesive Buccal Tablets

Formula code	Drug(mg)	CP	HPMC	Xanthan gum	Mg. Stereate
F1	150	-	30	-	5
F2	150	10	20	-	5
F3	150	15	15	-	5
F4	150	-	-	30	5
F5	150	10	-	20	5
F6	150	15	-	15	5

EVALUATION OF BLEND CHARACTERISTICS OF LAMIVUDINE [14]

Flow Property:

The flow property was determined by measuring the angle of repose. In order to determine the flow property, the angle of repose (s) was determined. It is the maximum angle that can be obtained between the free standing surface of a powder heap and the horizontal plane. Values of θ are rarely less than 20°, and values of up to 40° indicate reasonable flow potential. Above 50°, however, the powder flows only with difficulty if at all.

$\theta = \tan^{-1} (h/r)$

Where h = height the pile, r = radius of the pile, θ = angle of repose

The sample was taken in a funnel, which fixed in a holder (5cm) above the surface at an appropriate height and a graph of sheet was placed below the funnel. The sample was passed through the funnel slowly. The height of the powder heap formed was measured. The circumference formed was drawn with a pencil on the graph paper. The radius was measured and the angle of repose was determined. This was repeated three times for a sample.

Determination of bulk density and tapped density:

The powder (W) was carefully poured into the graduated measuring cylinder and the volume (V_O) was measured. Then the graduated cylinder was closed with lid and tapped 100times and after that, the volume (V_f) was measured and continued operation till the two consecutive readings were equal. The bulk density, and tapped density were calculated using the following formulas

Bulk density = W / V_O, Tapped density = W / V_f

Where, W = weight of the powder, V_O = initial volume, V_f = final volume

Compressibility index (Carr's index):

Compressibility index is an important measure that can be obtained from the bulk and tapped densities. In theory, the less compressible a material the more flow able it is. A material having values of less than 20 to 30% is defined as the free flowing material.

$C_I = 100 \underline{(V_O - V_f)}$

V_0

EVALUATION OF TABLETS

Friability test:

Friability of the tablets was tested using a Roche friabilator. The weight of 10 tablets was noted initially (W_1) and placed in the friabilator for 4min/100rpm. The tablets were reweighed and noted as (W_2). The difference in the weight is noted and expressed as percentage.

$$\text{Percentage friability} = \frac{(W_1 - W_2)\ 100}{W_1}$$

Weight variation test:

Twenty tablets were selected at random and the average weight was determined. Not more than two of the individual weights deviate from the average weight by more than the percentage deviation shown in table and none deviates by more than twice the percentage. IP official limits of percentage deviation of tablet are presented in the I.P.

Drug content uniformity:

Determine the content of active ingredient (s) in each of 10 tablets taken at random using the method given in the monograph or by any other suitable analytical method. The tablets comply with the test if not more than one of the individual values thus obtain is outside the limits 85 to 115% of the average value and none is outside the limits 75 to 125% of the average value.

Take the prepared Lamivudine tablet and separate the two layers (core and backing). Take tablets and crushed in mortar to fine powder. Then dissolve the total powder in 100ml phosphate buffer (pH 6.8). The solution was suitably diluted with pH 6.8-phosphate buffer. Analyze at 270nm in uv–vis spectrophotometry.

Water absorption studies: [10,15,16]

The water absorbing capacity of tables was determined by gravimetry. The swelling rate of the bioadhesive tablets was evaluated by using 1% agar gel plate. The average weight of the tablet was calculated (w_1). The tablets were placed on gel surface in a petridish placed in an incubator at 37±1ºC. Tablets was removed at different time intervals (0.5, 1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 h), wiped with filter paper and reweighed (w_2). The swelling index was calculated by the formula Swelling index = $(w_2-w_1)/ w$

Measurement of surface pH: [11,14]

The tablets were allowed to swell by keeping them in contact with 1ml of distilled water (pH 6.8±0.05) for 2hrs and pH was noted by bringing the electrode in contact with the surface of the formulations and allowing it to equilibrate for 1min.

In vitro dissolution studies:

Dissolution done by using USP XXIII paddle method, Tablet was keep first 2 hrs in 0.1 n Hcl and then phosphate buffer pH 6.8.

RESULTS AND DISCUSSION

EVALUATION OF BLEND CHARACTERISTICS OF LAMIVUDINE

Flow Property

Formulation code	Angle of repose ±S.D (*n*=3)
F_1	32º59’ ± 1.464
F_2	33º12’ ± 1.175
F_3	33º27’ ± 1.018
F_4	34º27’ ± 1.019
F_5	33º35’ ± 0.606
F_6	33º20’ ± 1.103

Physical characteristics of lamivudine blend

Formulation Code	Bulk density (gm/cc)	Tapped density (gm/cc)	Compressibility Index
F_1	0.433	0.52	16.66
F_2	0.371	0.43	14.28
F_3	0.406	0.49	17.18
F_4	0.433	0.50	13.33
F_5	0.382	0.47	14.70
F_6	0.317	0.43	14.28

Physical Characteristics

Formulation Code	Thickness (mm) ± S.D. *(n=3)*	Hardness (kg/sq.cm) ± S.D. *(n=3)*	Friability (%)
F_1	3.34 ± 0.128	5.2 ± 0.447	0.467
F_2	3.36 ± 0.203	5.4 ± 0.548	0.412
F_3	3.40 ± 0.057	5.8 ± 0.447	0.353
F_4	3.39 ± 0.061	5.6 ± 0.548	0.414
F_5	3.50 ± 0.147	5.4 ± 0.548	0.409
F_6	3.34 ± 0.106	5.6 ± 0.548	0.353

Weight variation test

Formulation Code	Average weight of Tablet	% Weight variation from Average	
		+	-
F_1	169.0	3.540	3.00
F_2	167.9	4.228	4.705
F_3	168.8	1.303	2.251
F_4	167.7	3.756	3.398
F_5	167.9	3.037	2.918
F_6	170.8	1.873	3.395

Mucoadhesive strength Drug content uniformity

Formulation Code	Mucoadhesive strength (gms) ± S.D. *(n=3)*
F_1	9.2 ± 0.16
F_2	16.0 ± 0.12
F_3	14.0 ± 0.16
F_4	10.0 ± 0.16
F_5	15.0 ± 0.08
F_6	12.4 ± 0.54

Formulation code	% Drug content ± S.D. *(n=3)*
F_1	96.1 ± 1.31
F_2	99.4 ± 1.52
F_3	98.5 ± 1.31
F_4	97.1 ± 1.46
F_5	97.8 ± 1.45
F_6	98.3 ± 1.00

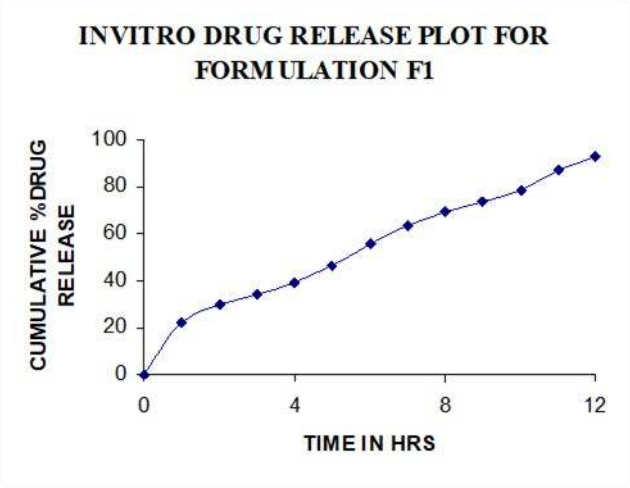
Measurement of Surface pH

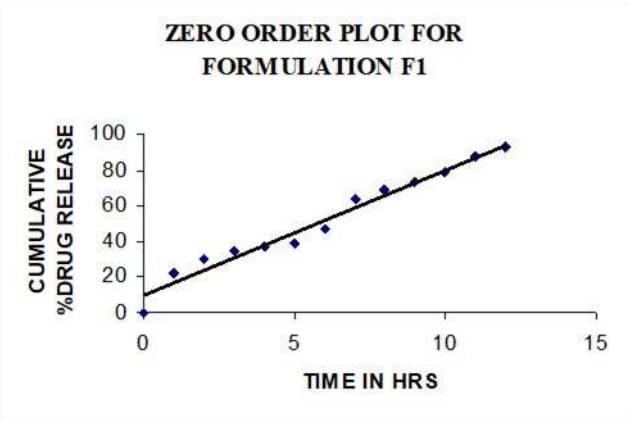
Formulation code	Surface pH ± S.D. *(n=3)*
F_1	7.0 ± 0.10
F_2	7.2 ± 0.23
F_3	7.3 ± 0.10
F_4	7.1 ± 0.11
F_5	6.9 ± 0.10
F_6	7.4 ± 0.05

IN VITRO DISSOLUTION PROFILE OF FORMULATION F1

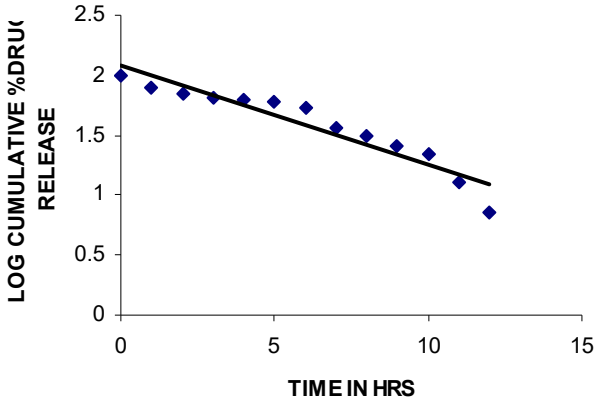
Sl No	Time (hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
0	0	0	0.000	0.000	0.000
1	1	0.0201	1.552	1.397	22.347±0.90
2	2	0.0271	2.094	1.886	30.176±0.42
3	3	0.0328	2.537	2.287	34.594±0.55
4	4	0.0328	2.537	2.287	37.594±0.55
5	5	0.0352	2.707	2.443	39.089±1.20
6	6	0.042	3.249	2.933	46.929±1.30
7	7	0.057	4.409	3.981	63.688±0.60
8	8	0.060	4.641	4.194	69.100±0.45
9	9	0.066	5.105	4.616	73.857±0.84
10	10	0.070	5.414	4.900	78.394±0.76
11	11	0.078	6.030	5.459	87.346±0.65
12	12	0.0829	6.412	5.807	92.915 ±0.53

*Average of three value, ± Standard deviations

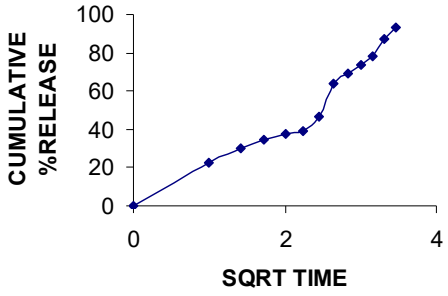




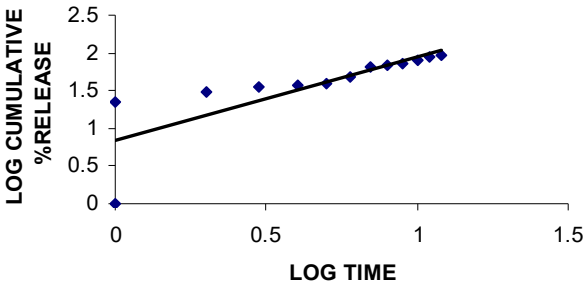
FIRST ORDER PLOT FOR FORMULATION F1



HIGUCHI PLOT FOR FORMULATION F1



PEPPA'S PLOT FOR FORMULATION F1

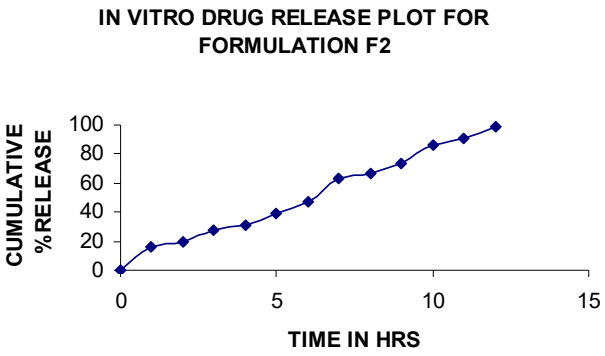


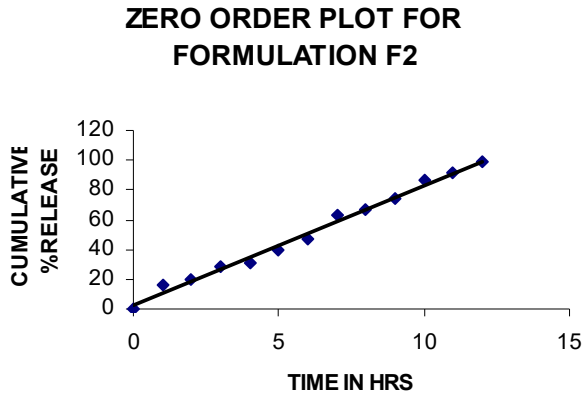
VITRO DISSOLUTION PROFILE OF FORMULATION F2

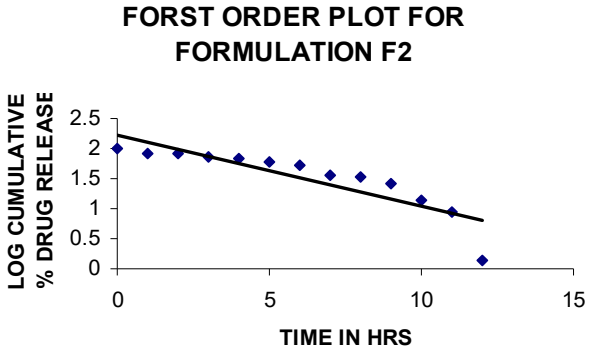
Sl. No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative per-centage of drug re-leased
0	0	0	0.000	0.000	0.000
1	1	0.014	1.108	0.998	15.962±1.00
2	2	0.018	1.388	1.250	20.000±0.65
3	3	0.025	1.934	1.743	27.885±0.58

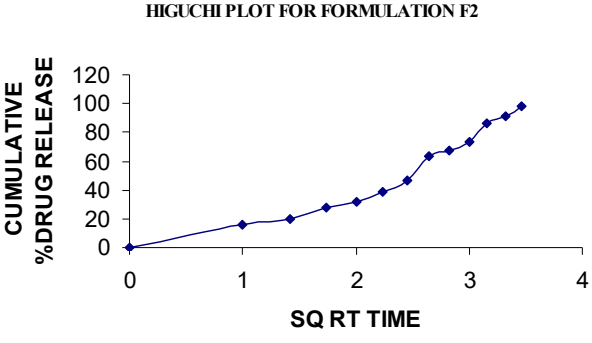
Sl. No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
4	4	0.028	2.166	1.954	31.258±0.48
5	5	0.035	2.707	2.443	39.089±1.20
6	6	0.042	3.249	2.933	46.929±1.30
7	7	0.057	4.409	3.981	63.688±0.60
8	8	0.060	4.641	4.194	67.100±0.45
9	9	0.066	5.105	4.616	73.857±0.84
10	10	0.077	5.988	5.41	86.51±1.40
11	11	0.081	6.300	5.69	91.09±0.90
12	12	0.088	6.815	6.16	98.61±0.80

*Average of three value, ± Standard deviations









IN VITRO DISSOLUTION PROFILE OF FORMULATION F3

Sl No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
0	0	0.000	0.000	0.00	0.00
1	1	0.016	1.215	1.09	17.50±0.80
2	2	0.020	1.554	1.40	22.40±0.75
3	3	0.028	2.166	1.95	31.23±0.65
4	4	0.044	3.403	3.07	49.09±0.90
5	5	0.047	3.897	3.52	52.25±0.54
6	6	0.050	3.897	3.52	56.25±0.54
7	7	0.053	3.897	3.52	60.25±0.54
8	8	0.057	4.409	3.981	65.688±0.60
9	9	0.066	5.105	4.616	70.857±0.84
10	10	0.070	5.414	4.900	78.394±0.76
11	11	0.078	6.030	5.459	87.346±0.65
12	12	0.081	6.281	6.102	95.023±1.10

*Average of three value ± Standard deviations

IN VITRO DISSOLUTION PROFILE OF FORMULATION F4

Sl No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
0	0	0.0000	0.000	0.000	0.000
1	1	0.0170	1.313	1.181	18.900±0.60
2	2	0.0207	1.603	1.444	23.100±1.10
3	3	0.0250	1.934	1.743	27.892±0.34
4	4	0.031	2.166	1.954	35.258±0.48
5	5	0.035	2.707	2.443	39.089±1.20
6	6	0.042	3.249	2.933	43.929±1.30
7	7	0.0472	3.651	3.293	51.693±0.65
8	8	0.060	4.641	4.194	65.100±0.45
9	9	0.066	5.105	4.616	71.857±0.84
10	10	0.070	5.414	4.900	75.394±0.76
11	11	0.078	6.030	5.459	89.346±0.65
12	12	0.088	6.815	6.16	96.61±0.80

*Average of three value, ± Standard deviations

IN VITRO DISSOLUTION PROFILE OF FORMULATION F5

Sl No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
0	0	0	0	0	0
1	1	0.0201	1.552	1.397	22.347±0.90
2	2	0.0271	2.094	1.886	30.176±0.42
3	3	0.0328	2.537	2.287	36.594±0.55
4	4	0.0358	2.537	2.287	39.594±0.55
5	5	0.0425	3.897	3.52	42.929±1.30
6	6	0.053	3.897	3.52	46.929±1.30
7	7	0.0605	4.680	4.227	57.693±0.65

Sl No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
8	8	0.0625	4.833	4.370	69.100±0.45
9	9	0.066	5.105	4.616	75.857±0.84
10	10	0.070	5.414	4.900	79.394±0.76
11	11	0.078	6.030	5.459	91.346±0.65
12	12	0.082	6.281	6.102	97.023±1.10

*Average of three value, ± Standard deviations

IN VITRO DISSOLUTION PROFILE OF FORMULATION F6

Sl No	Time(hrs)	Absorbance (245nm)	Concentration in mcg/ml	Cumulative amount drug released (mg)	*Cumulative percentage of drug released
0	0	0	0.000	0.000	0.000
1	1	0.014	1.108	0.998	15.962±1.00
2	2	0.018	1.388	1.250	20.000±0.65
3	3	0.025	1.934	1.743	27.885±0.58
4	4	0.028	2.166	1.954	31.258±0.48
5	5	0.035	2.707	2.443	39.089±1.20
6	6	0.042	3.249	2.933	46.929±1.30
7	7	0.057	4.409	3.981	63.688±0.60
8	8	0.060	4.641	4.194	67.100±0.45
9	9	0.066	5.105	4.616	73.857±0.84
10	10	0.070	5.414	4.900	78.394±0.76
11	11	0.078	6.030	5.459	87.346±0.65
12	12	0.081	6.281	6.092	94.023±1.10

*Average of three value, ± Standard deviations

RELEASE KINETICS

Formula Code	Drug release Kinetics						
	Zero order		First order		Higuchi	Peppa's	
	K_0	r	K_1	r	R	n	R
F_1	11.3036	0.99079	0.44296	0.832653	0.9804	0.66007	0.99194
F_2	9.17987	0.99571	0.369	0.766278	0.96207	0.76813	0.99052
F_3	8.44584	0.99561	0.1635	0.947604	0.95609	0.8558	0.9958
F_4	7.67705	0.99746	0.21105	0.895399	0.95477	0.85626	0.99093
F_5	10.323	0.99688	0.38107	0.801977	0.96315	0.82223	0.9961
F_6	8.6549	0.99617	0.31972	0.817707	0.95783	0.84842	0.99494

K_0- Zero order rate constant **K_1**- First order rate constant

r – Coefficient of Correlation **n**- diffusional exponent

DISCUSSION

In the present work efforts have been made to develop mucoadhesive tablets of lamivudine using direct compression technique involving mucoadhesive polymers like Carbopol, various cellulose ethers having different degree of solubility and swellability, such as Hydroxy propyl methyl cellulose and xanthan gum. Magnesium stearate was included as anti adherent.

The FTIR spectral analysis showed that there was no appearance or disappearance of any characteristic peak, which confirms the absence of chemical interaction between drug and polymers.

The blend physical characteristics were studied. The angles of repose of all formulation blends F_1 to F_6were

in the range 31º36' ± 0.825 to 34º35' ± 0.459. The bulk density, tapped density, Corr's index and Hausner ratio were found in the range of 0.317-0.433gm/cc, 0.43-0.52gm/cc, 13.33-17.18 and 1.15-1.2 respectively. It reveals that all the formulation blends were having good flow characteristics and flow rates.

Thickness of all formulations F_1-F_6were in the range of 3.20 ± 0.142 to 3.50 ± 0.147 mm. Hardness of all formulations F_1-F_8 were in the range of 5.2 ± 0.447 to 5.8 ± 0.447 kg/sq.cm. Percentage friability of all formulations F_1 to F_8 was in the range of 0.353 to 0.467 %.

The Percentage weight variation for of all formulations F_1 to F_8 was in the range of 1.3 to 4.7%. Percentage of drug content for all formulations F_1 to F_8 was in the range of 96.1 ± 1.31 to 99.4 ± 1.52 %.

Water absorption

Swelling index was high 1.397 ± 0.0166 for F_6 formulation, which having all polymers in high levels and low 1.119 ± 0.0346 for F_1 formulation, which was having all polymers in low levels. Surface pH of all the formulations was in the range of 6.6 ± 0.17 to 7.2 ± 0.10.

Bioadhesion

The term bioadhesion is related to the ability of some synthetic biological macromolecules and hydrocolloids adhere to biological tissues. During the process of bioadhesion between materials, the surface energy of the system is decreased and a new interface is formed by destroying the two free surfaces. Many hydrophilic polymers Carbopol of forming hydrogen bonds have shown good adhesion properties. The property of polymer is closely associated with bioadhesion because polymer swelling depending up on the water imbibitions which in turn increases the diffusion and interpenetration of macromolecules. The mucoadhesive strength of all the formulations F_1 to F_8 was found to be in the range of 8.8 ± 0.16gms to 16.0 ± 0.12gms.

CONCLUSION

Mucoadhesion is a topic of current interest in the design of drug delivery systems. Mucoadhesive drug delivery systems are delivery systems which become adhesive on hydration to the mucin layer of a mucosal tissue. These systems prolong the residence time of the dosage form at the site of application or absorption and facilitate an intimate contact of the dosage form with the underlying absorption surface and thus contribute to improved bioavailability and better therapeutic performance of drugs.

In the present work mucoadhesive tablets of lamivudine were formulated employing Carbopol, Hpmc and xanthan gum as polymer materials with other common additives in tablets and the tablets were evaluated for drug release and in vitro Mucoadhesive properties. Oral controlled release formulations of lamivudine were designed and were evaluated. The following conclusions are drawn from the results obtained.

All the batches of lamivudine tablets prepared employing CARBOPOL, HPMC and XANTHAN GUM were of good quality with regard to weight varation, hardness, friability ,water absorption studies, surface pH, drug content, invitro drug release. All the formulations exhibited anomalous (non-ficikan transport) diffusion mechanism and follow zero order kinetic. The formulation F_6 (CP -15mg, HPMC -40mg, and Mag.Ste-20mg) was selected as optimized formulation based on $t_{90\%}$ value of 10.67 hrs with 99.74 ± 0.06% of drug release at 12^{th} hr and had good bioadhesion strength. The mucoadhesive tablets of lamivudine may be a good way to bypass the extensive hepatic first-pass metabolism and to improve the bioavailability of lamivudine through mucosa.

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