Research Article

FORMULATION DEVELOPMENT AND EVALUATION OF COLON TARGETED TABLETS OF SECNIDAZOLE FOR THE TREATMENT OF AMOEBIASIS

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ABSTRACT

Protozoal infections are common among people in the under developed tropical and subtropical countries. From the last few decades, a great deal of research work has been devoted to the development of the site specific drug delivery systems which offer several benefits over the traditional drug therapies. The colon, as a site for drug delivery, offers distinct advantages on account of a near neutral pH, a much longer transit time, relatively low proteolytic enzyme activity, and a much greater responsiveness to absorption enhancers. In the present study, an attempt was made to design colon targeted compression coated tablets of Secnidazole for treatment of amoebiasis. The main interest in such dosage form was to target the drug to the colon by ensuring minimal amount of drug release in the physiological environment of the upper GI tract. Drug polymer compatibility studies were carried out using FT-IR and UV spectrophotometer. Preparation of Secnidazole compressed coated tablets was done using Calcium pectinate and HPMC K15M. Optimization of compression coated tablets formulation was done using 3^2 full factorial designs. Tablets were evaluated for hardness, frability, weight variation, drug content, *in vitro*, and stability study. Comparative dissolution profiles of all the batches with pectinase enzymes indicated that as HPMC K15M level increased drug release in the initial hours was retarded. The compression coated Secnidazole tablets coated with Calcium pectinate: HPMC K15M in 90:10 ratios with 450mg coat weight are most likely to provide targeted delivery of Secnidazole to the colon.

Keywords: Secnidazole, HPMC K15M, compressed coated tablets, Calcium pectinate, Full factorial design.

INTRODUCTION

Protozoal infections are common among people in the under developed tropical and subtropical countries where sanitary conditions, hygienic practices and control of the vectors of transmission are inadequate. Amoebiasis is caused by *Entamoeba histolytica*, named for its lytic action on tissues[1]. The disease can be acute or chronic with patients showing varying degrees of illness, from no symptoms to mild diarrhea, to fulminating dysentery[2]

From the last few decades, a great deal of research work has been devoted to the development of the site specific drug delivery systems which offer several benefits over the traditional drug therapies. The therapeutic advantages of targeting the drug to the diseased organ include[3], delivery of the drug in its intact form as close as possible to the target site, reduced incidence of adverse side effects etc. The colon, as a site for drug delivery, offers distinct advantages on account of a near neutral pH, a much longer transit time, relatively low proteolytic enzyme activity, and a much greater responsiveness to absorption enhancers. Various diseases of colon such as ulcerative colitis, Crohn's disease, carcinoma and infections require local therapy. So, the development of locally acting colon targeted drug delivery systems may revolutionize the treatment of colonic diseases.[4,5,6] Successful colonic drug delivery requires careful consideration of a number of factors, including the properties of the drug, the type of delivery system and its interaction with the healthy or diseased gut.

The objective of the present study is to develop colon targeted oral tablets for producing local action. Secnidazole is the drug proposed to be used for the present study. It is used in the treatment of amoebiasis, giardiasis and trichomoniasis. Chemically, it is 5-nitroimidazole derivative[7]. The main interest in such dosage form was to target the drug to the colon by ensuring minimal amount of drug release in the physiological environment of the upper GI tract. The compression coated Secnidazole tablets coated with Calcium pectinate: HPMC K15M in 90:10 ratios with 450mg coat weight are most likely to provide targeted delivery of Secnidazole to the colon. Accelerated stability study of optimized formulation was performed which showed slight change in the physico-chemical parameters and *in vitro* drug release study.

MATERIALS AND METHODS

MATERIALS:

Secnidazole was obtained by Sourya Chemicals Ltd., Mumbai. Hydroxy Propyl Methyl Cellulose K15M, Calcium pectinate, Sodium starch glycolate, Magnesium stearate, Pectinase enzymes was obtained by Unique Pharmaceuticals Laboratory Ltd., Ankleshwar,

Polyvinylpyrollidone K30 was obtained by Central Drug House (P) Ltd.

METHODS:

Preformulation Study:

Drug polymer compatibility studies

Drug polymer compatibility studies were carried out using FT-IR (Shimazdu 8400 S, CE). Infrared Spectrum of pure drug was seen in between 400 to 4000 cm^{-1}.

Spectrophotometric method for estimation of Secnidazole

Reagents: 1) Standard Stock – 1mg/ml in 0.1N HCl

2) Working Stock – 100 µg/ml in 0.1N HCl

3) 0.1N HCl

Determination of Beer's law range and plotting of calibration curve

From the working stock solution, different aliquots of 0.5, 1, 1.5, 2.0, 2.5 and 3.0 ml was taken in series of 10ml volumetric flasks and volume was made up with 0.1N HCl to get a series of working standard solutions. The absorbance of the samples was obtained spectrophotometrically at 277nm using UV spectrophotometer (Systronic) and a calibration curve was constructed.

Preparation of Secnidazole core tablets

The core tablets (average weight 222.5mg) of Secnidazole for compression coating with Calcium pectinate and HPMC K15M were prepared by wet granulation technique using PVP-K30 as binder by Full Factorial Design[8, 9, 10]. Sodium starch glycolate (10mg) was added to obtain a fast disintegrating tablet. Secnidazole and Sodium starch glycolate were passed through the 44# mesh and thoroughly mixed then granulated using PVP-K30 solution as the binder. The granules so obtained were dried at 45°C for 2 h in the oven. Dried granules were passed through 22# mesh and the fines were separated using 44# mesh to obtain 22-44# mesh granules. These granules were lubricated with magnesium stearate (1%). The lubricated granules were compressed into tablets using 8 mm round, concave punch. Then tablets were punched at an applied force of 1.5 to 2.0 kg/cm^2. [11-14] The composition of fast disintegrating core tablet was shown in Table-1.

Table 1: Composition of fast disintegrating core tablet of Secnidazole

Ingredients	Quantity (mg)
Secnidazole	200
Sodium starch glycolate	10
PVP-K30 (as binder)	10
Magnesium stearate	2.5
Total	222.5

Preparation of Secnidazole compression coated tablets

The core tablets of Secnidazole were compression coated with different coat formulation. The compression coat formulations prepared using varying ratio of Calcium pectinate and HPMC K15M was passed through the 44# mesh and thoroughly mixed then granulated using PVP-K30 solution as the binder. The granules so obtained were dried at 45°C for 2 h in the oven. Dried granules were passed through 22# mesh and the fines were separated using 44# mesh to obtain 22-44# mesh granules. Initially, 40% of coat weight was placed in a 12mm die cavity of a tablet punching machine followed by carefully centering the core tablet and addition of reminder of coat weight[11, 12, 13, 14]. (Table 2)

Table 2: Formulation Chart (Full Factorial Design)

Composition of coat formulation of compression coated tablets of Secnidazole

Code	Level		
	-1	0	1
Total amount of polymer (mg) (X_1)	250	350	450
% of HPMC K15M (X_2)	10	20	30
Formulation Code	**Total Weight of Polymer**	**% of HPMC K15M**	
F1	-1	-1	
F2	-1	0	
F3	-1	+1	
F4	0	-1	
F5	0	0	
F6	0	+1	
F7	+1	-1	
F8	+1	0	
F9	+1	+1	

Evaluation of tablets:

Diameter: The diameter of the tablets was determined by using Vernier calipers. Five tablets from each formulation were used and average values were calculated[15].

Thickness: The thickness of the tablets was determined by using Vernier calipers. Five tablets from each formulation were used and average values were calculated[15].

Hardness and friability: For each formulation, the hardness and friability of 5 tablets were determined using the Monsanto hardness tester and the Roche friabilator, respectively[15].

Weight variation test: To study weight variation 5 tablets of each formulation were weighed using digital balance and the test was performed according to the official method[15].

Determination of percentage Secnidazole content in tablets

The Secnidazole tablets were tested for their drug content. Five tablets were finely powdered; quantities of the powder equivalent to 50 mg of Secnidazole were accurately weighed and transferred to a 100-ml of volumetric flask. The flask was filled with 0.1N HCl solution and mixed thoroughly. The solution was made up to volume and filtered. Dilute 10 ml of the resulting solution to 250 ml with 0.1N HCl and measure the absorbance of the resulting solution at the maximum at 277 nm using a UV-visible double beam spectrophotometer. The linearity equation obtained from calibration curve as described previously was used for estimation of Secnidazole in the tablets formulations.

***In-vitro* drug release studies**

The compression coated tablets of Secnidazole to remain intact in the physiological environment of stomach and small intestine was assessed by conducting *in vitro* drug release studies. Drug release studies were carried out using a USP XXIII dissolution rate test apparatus (Apparatus II, 50 rpm, 37 ± 2°C) in 500ml of various ascending gastrointestinal fluid viz., in pH 1.2 buffer for the first 2 hours, in pH 6.8 for the next 4 hours and finally in pH 6.8 containing 3 ml Pectinase enzymes and tested for drug release up to 24 h. At the end of the time period, 5ml of the samples were taken and diluted with 0.1N HCL and analyzed for Secnidazole content as described previously. A 5 ml volume of fresh and filtered dissolution medium was added to make the volume after each sample withdrawal [16,17].

Stability studies

Stability studies were conducted on all the optimized/most satisfactory formulations for 2 months. The tablet formulations were packed in aluminum foil and were exposed to 40°C ± 2°C / 75% ± 5% RH and 30°C±2°C/65%±5% RH in humidity control oven as per ICH guidelines118 Q1C: "Stability testing of new dosage forms." Sampling was done at predetermined time intervals of 0, 30 and 60 days. The tablets were evaluated for various physico-chemical parameters viz., appearance, drug content, hardness, and in vitro drug release profiles[18].

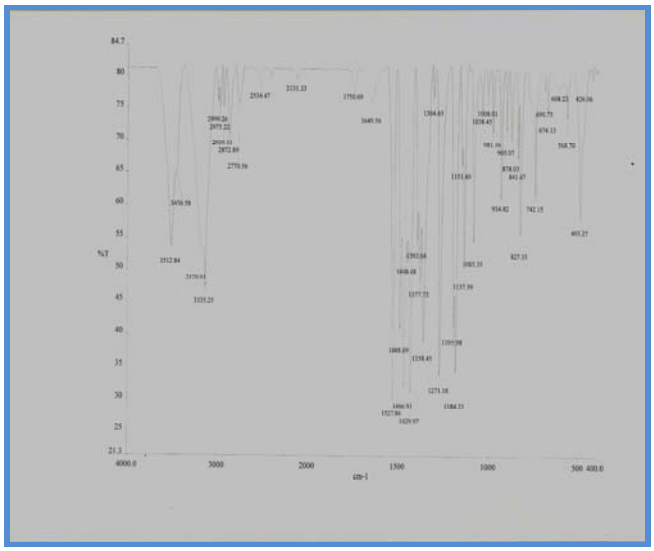
RESULTS AND DISCUSSION

Preformulation Study:

Method was developed for estimation of Secnidazole showed maximum absorption at wavelength 277 nm in 0.1N HCl. The value of regression coefficient was found to be 0.9935. The standard calibration curve obeyed Beer's law at the given concentration range of 5 μg/ml to 30 μg/ml in 0.1N HCl.

In order to investigate the possible interaction between drug and selected polymers, FT-IR studies were carried out by preparing KBr disk. In the FT-IR spectrum of Secnidazole, the characteristic peaks corresponding to an -OH group (3509.8 cm^{-1}), a -NO_2 group (1527.6 cm^{-1}), a -CH_3 group (1466.4 cm^{-1}), a -CH_2 group (1489 cm^{-1}) and -CN groups (1271 cm^{-1}) were identified, which was same in all drug and polymer mixture. The FTIR spectra was shown in figure -1.

Figure 1: FT-IR of physical mixture of drug with calcium pectinate & HPMC K15M



Micromeritic Properties:

The micromeritics properties indicate that this drug does not possess suitable flowing properties and therefore, this should be improved using wet granulation technique. The granules of core tablets and coat formulations were evaluated for angle of repose, Micromeritic properties of granules of core tablet and coat formulation shown in table 3.

Table 3: Micromeritic properties of granules of core tablet and coat formulation

Formulation Code	Angle of Repose* (± S.D) (°)
Core	24.03 ± 0.78
F1	26.61 ± 0.98
F2	26.35 ± 1.23
F3	26.13 ± 1.06
F4	28.24 ± 0.86
F5	28.88 ± 1.29
F6	29.55 ± 1.09
F7	30.59 ± 1.19
F8	30.67 ± 1.43
F9	31.18 ± 1.36

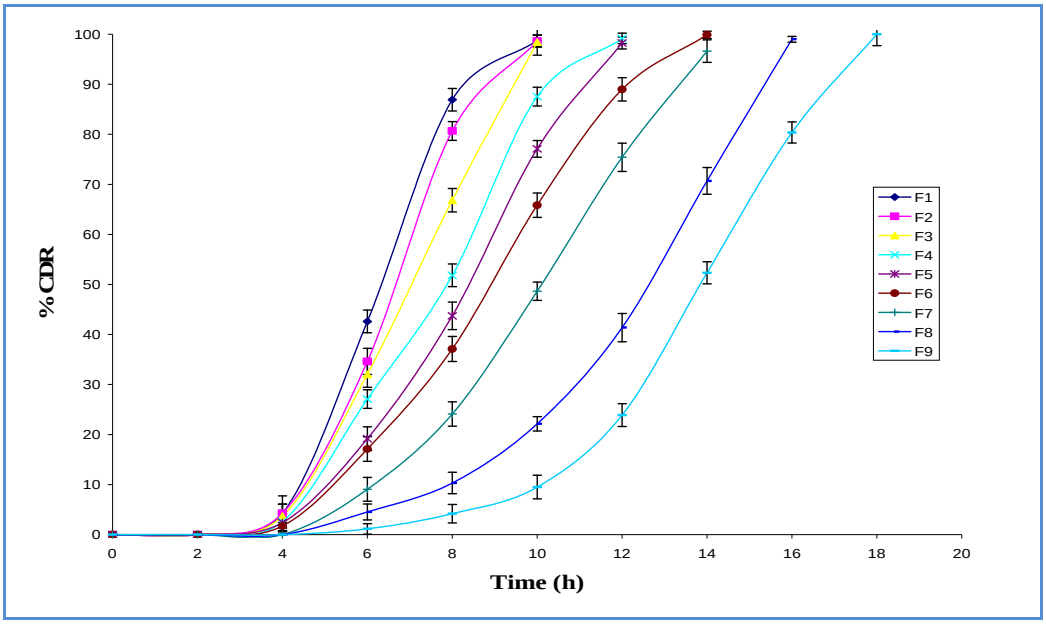
Evaluation of tablets

Evaluation of compression coated tablets of Secnidazole was shown in table 4 which showing following results.

Table 4: Physico-chemical properties of compression coated tablets of Secnidazole

Formulation code	Thickness* (± S.D) (mm)	Hardness* (± S.D) (kg/cm^2)	Friability* (± S.D) (%)	Weight variation* (± S.D) (%)	Drug content* (± S.D) (%)
F1	4.14 ± 0.054	6.73 ± 0.16	0.45	± 2	99.79 ± 0.36
F2	4.3 ± 0.070	6.77 ± 0.16	0.39	± 1	99.34 ± 0.12
F3	4.52 ± 0.044	6.79 ± 0.28	0.35	± 2	99.96 ± 0.23
F4	5.1 ± 0.070	6.74 ± 0.17	0.44	± 1	99.67 ± 0.31
F5	5.28 ± 0.083	6.79 ± 0.20	0.39	± 2	99.95 ± 0.51
F6	5.52 ± 0.044	6.83 ±0.28	0.35	± 1	99.02 ± 0.14
F7	6.14 ± 0.053	6.77 ± 0.28	0.43	± 1	99.74 ± 0.56
F8	6.28 ± 0.13	6.81 ± 0.33	0.37	±1	99.97 ± 0.332
F9	6.52 ± 0.044	6.85 ± 0.28	0.32	±1	98.87 ± 0.382

Figure 2: *In-Vitro* drug release study of various formulations



Thickness: Thickness of formulation shown in table 4. Thickness of formulations F1 to F3, F4 to F6 and F7 to F9 are in the range of, 4.08 to 4.56mm, 5.03 to 5.47mm and 6.08 to 6.56mm respectively.

Hardness: The average hardness of all the compression coated tablet formulation no. F1 to F9 lies in the range of 6.57 to 7.13 kg/cm^2.

Friability: The average friability of all the formulation no. F1 to F9 lies in the range of 0.32 to 0.45%.

Weight variation test: Average weight of the fast disintegrating core tablet were found to be around 222.5mg (± 5%) while formulation no.F1 to F3, F4 to F6 and F7 to F9 also show weight variation (±5%).

Uniformity of drug content: Drug content of the developed formulations was shown in table 4 which found to be near 99%, which is within the official requirements.

***In-vitro* drug release studies:** In-Vitro drug release profile was shown in figure 2. Dissolution was continued up to 24h depending on the tablet degradation pattern. Comparative dissolution profile of all the batches with pectinase enzymes shown figure, which indicates that as HPMC K15M increase, drug release in the initial hours can be retarded. $T_{80\%}$ values for the nine batches show a wide variation. i.e., the response ranges from a minimum of 7 to 16 h. At a lower level of calcium pectinate, degradation of tablet was fast and hence, premature drug release was observed. However, decreases in the values of Y_{6h} and increases in $T_{80\%}$ clearly indicate the effect of coat weight on drug release. As the coat weight increased, the value of $T_{80\%}$ increased and Y_{6h} decreased. Higher HPMC K15M levels (Formulation Code F7 to F9) showed slower drug release. Release at 6 h (Y_{6h}) and difference in percent drug release between 6h and 10h of dissolution of tablet in presence of pectinase enzymes (YD) values were 9.06, 4.53 and 1.15% and 39.59, 17.61 and 8.36% with pectinase enzymes. The formulation was intended to release minimum amount of drug in the upper GIT and soon after to release most of the Secnidazole to the colon between 6h and 10h.[54] Hence final selection was conducted from formulation F7, F8 and F9 showing YD values 39.59%, 17.60% and 8.35%, but drug release from formulation F8 and F9 is very slow because of stiff gel formation, which could not be degraded by pectinase enzymes.

DISCUSSION

Oral drug delivery represents one of the frontier areas of controlled drug delivery system. Colon targeted drug delivery system belongs to oral drug delivery system group, which is capable of protecting the release of the drug in the stomach and small intestine and release the drug in the colon.

Secnidazole is an anti-amoebic drug used in the treatment of intestinal amoebiasis. This drug is to be delivered to the colon for their effective action against *E.* histolytica wherein the trophozoites reside in the lumen of the caecum and large intestine and adhere to the colonic mucus and epithelial layers. But the pharmacokinetic profile of Secnidazole indicates that the drug is completely absorbed after oral administration. The administration of this drug in conventional tablet dosage form provides minimal amount of Secnidazole for local action in the colon, still resulting in the relief of amoebiasis, but with unwanted side effects. Therefore, the targeting of Secnidazole to the colon for local action may be beneficial in avoiding the unwanted side effects as well as a lower dose of Secnidazole may be sufficient to treat amoebiasis.

Preformulation studies: Drug polymer interaction study was done by using UV spectrophotometry and FTIR which showed linear relationship between concentration and absorbance. The standard calibration curve obeyed Beer's law at the given concentration range of 5 μg/ml to 30 μg/ml in 0.1N HCl. This indicates there was no drug polymer interaction. The data forther conform by FTIR which shows no change in drug peaks which indicates there was no drug polymer interaction.

Micromeritic Properties: The granules of core tablets and coat formulations were evaluated for angle of repose. From the studies, the angle of repose was found to be 24°-32° which indicates good flow properties.

Evaluation of tablets: Physical properties of tablets were checked for the tablets like thickness and hardness, which shows that all formulation form F1 to F9 shows a proper thickness and hardness. The average friability of all the formulations F1 to F9 lies in the range of 0.32 to 0.45%. Evaluation of tablets were perform for another official test weight variation test average weight of the fast disintegrating core tablet were found to be around 222.5mg (± 5%) while formulation no.F1 to F3, F4 to F6 and F7 to F9 also show weight variation (±5%). Thus all the formulations were found to be complying with the standards given in IP. Drug content of the developed formulations was found to be near 99%, which is within the official requirements.

***In-vitro* release studies:** For the drug delivery system designed for colon targeting, it is desirable that the system remains intact in the physiological environment of stomach and upper intestine and release the drug in the colon. For the present study, it is desirable to design the formulation such that it releases Secnidazole in the colon ensuring minimum loss of drug in the upper GIT. The compression coat was designed to undergo pectinase enzyme degradation in the colon and rapidly disintegrate core in the colon. To determine pectinase enzyme degradation of calcium pectinate coat, dissolution studies were carried out with 3ml pectinase enzymes. Pectinase enzymes were added at 6 h to simulate the colon arrival time under normal conditions. Dissolution was continued up to 24 h depending on the tablet degradation pattern. Comparative dissolution profile of all the batches with pectinase enzymes indicate that as HPMC K15M increase, drug release in the initial hours can be retarded. $T_{80\%}$ values for the nine batches show a wide variation. i.e., the response ranges from a minimum of 7 to 16 h. At a lower level of calcium pectinate, degradation of tablet was fast and hence, premature drug release was observed. However, decreases in the values of Y_{6h} and increases in $T_{80\%}$ clearly indicate the effect of coat weight on drug release. As the coat weight increased, the value of $T_{80\%}$ increased and Y_{6h} decreased. Higher HPMC K15M levels (Formulation Code F7 to F9) showed slower drug release. Release at 6 h (Y_{6h}) and difference in percent drug release between 6h and 10h of dissolution of tablet in presence of pectinase enzymes (YD) values were 9.06, 4.53 and 1.15% and 39.59, 17.61 and 8.36% with pectinase enzymes. The formulation was intended to release minimum amount of drug in the upper GIT and soon after to release most of the Secnidazole to the colon between 6h and 10h.[54] Hence final selection was conducted from formulation F7, F8 and F9 showing YD values 39.59%, 17.60% and 8.35%, but drug release from formulation F8 and F9 is very slow because of stiff gel formation, which could not be degraded by pectinase enzymes. Therefore formulation F7 was selected as an optimized formulation with YD as maximum.

OPTIMIZATION:

(1) Release at 6 h (Y_{6h}):

Equation:

$$Y = 99.906581 - 0.1805141*X_1 - 1.6587576*X_2 - 0.0008292*X_1X_2 + 0.00000834*X_1^2 + 0.022274*X_2^2$$

β_1: Negative co-efficient (-0.1805141) of total amount of polymer suggests that as total amount of polymer increases, release of drug at 6 h is decreased.

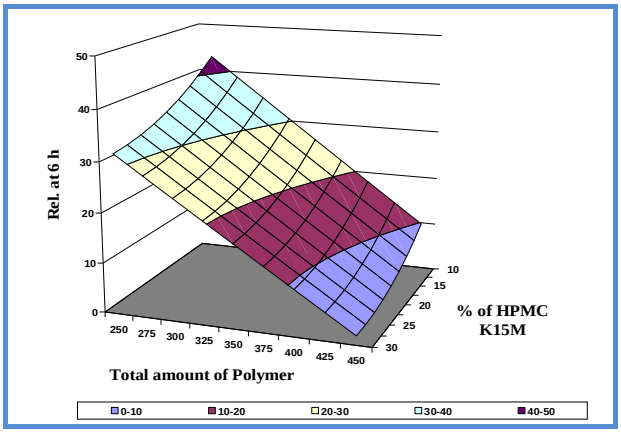
β_2: Negative co-efficient (-1.6587576) of % of HPMC K15M suggests that as % of HPMC K15M increases, release of drug at 6 h is decreased.

β_3: Negative co-efficient (-0.0008292) of X_1 and X_2 suggests that as total amount of polymer and % of HPMC K15M increase, due to interaction between polymers release of drug at 6 h is further retarded.

β_4: Positive co-efficient (+0.00000834) of X_1^2 suggests that as total amount of polymer increases, release of drug at 6 h is decreased slowly.

β_5: Positive co-efficient (+0.022274) of X_2^2 suggests that as % of HPMC K15M increases, release of drug at 6 h is decreased slowly.

Figure 3: Surface plot of $T_{80\%}$



(2) YD :

Equation :

$Y = 94.88321 - 0.928286*X_1 - 2.9910205*X_2 - 0.0099083*X_1X_2 + 0.0013357*X_1^2 + 0.0024837*X_2^2$

β_1: Negative co-efficient (-0.928286) of total amount of polymer suggests that as total amount of polymer increases, % of drug release between 6 h and 10 h is decreased.

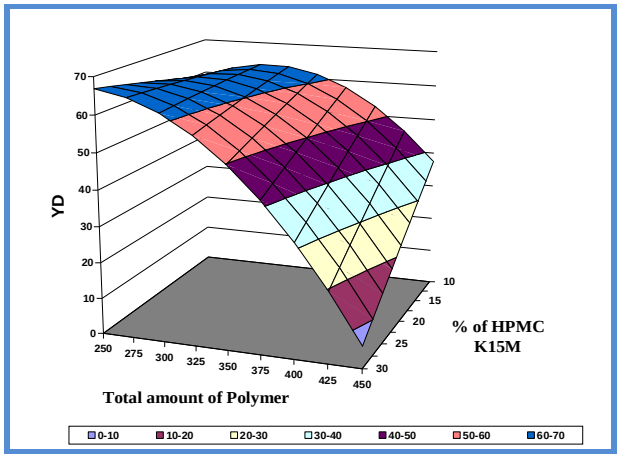
β_2: Negative co-efficient (-2.9910205) of % HPMC K15M suggests that as % of HPMC K15M increases, % of drug release between 6 h and 10 h is decreased.

β_3: Negative co-efficient (-0.0099083) of X_1 and X_2 suggests that as total amount of polymer and % of HPMC K15M increase, due to interaction between polymers, % of drug release between 6 h and 10 h is further retarded.

β_4: Positive co-efficient (+0.0013357) of X_1^2 suggests that as total amount of polymer increases, % of drug release between 6 h and 10 h is decreased slowly.

β_5: Positive co-efficient (+0.0024837) of X_2^2 suggests that as % of HPMC K15M increases, % of drug release between 6 h and 10 h is decreased slowly.

Figure 4: Surface plot of YD



(3) $T_{80\%}$ (h):

Equation:

$Y = 0.3201837 + 0.0247695*X_1 + 0.01298*X_2 + 0.0006162*X_1X_2 - 0.0000103*X_1^2 - 0.0028303*X_2^2$

β_1: Positive co-efficient (+0.0247695) of total amount of polymer suggests that as total amount of polymer increases, the value of **$T_{80\%}$** is increased.

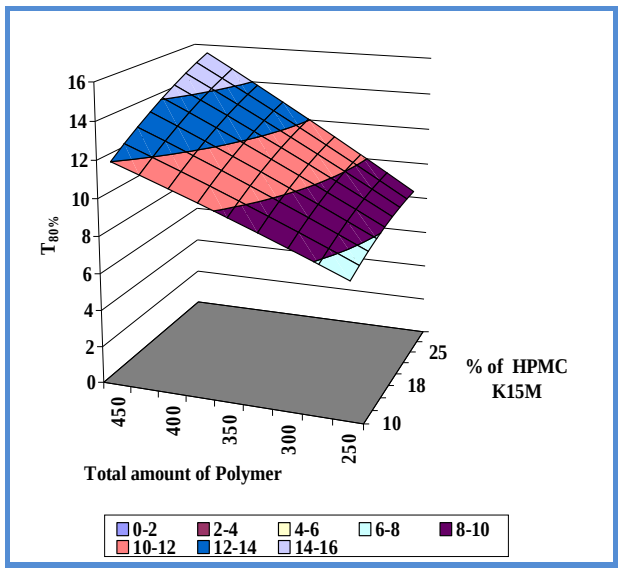
β_2; Positive co-efficient (+0.01298) of amount of HPMC K15M suggests that as % of HPMC K15M increases**,** $T_{80\%}$ is increased.

β_3: Positive co-efficient (+0.0006162) of X_1 and X_2 suggests that as total amount of polymer and % of HPMC K15M increase, $T_{80\%}$ is increased rapidly. So no significant interaction was found.

β_4: Negative co-efficient (-0.0000103) of X_1^2 suggests that as total amount of polymer increases, $T_{80\%}$ is increased slowly**.**

β_5: Negative co-efficient (-0.0028303) of X_2^2 suggests that as % of HPMC K15M increases, $T_{80\%}$ is increased slowly.

Figure 5: Surface plot of $T_{80\%}$



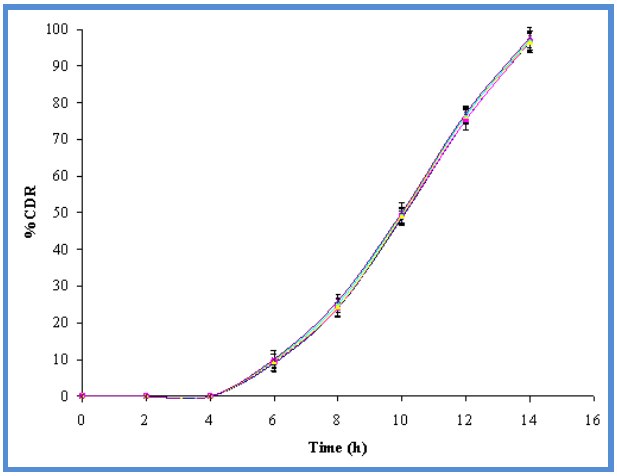
Stability studies

Stability studies were performed under accelerated storage conditions as per ICH guidelines on the most satisfactory formulation OF to find out the effect of 30°C±2°C/65%±5% RH and 40°C±2°C/75%±5% RH conditions on the formulation.

There was a slightly decrease in the hardness values during the stability studies and the drug content was found to be within the official limits.

The in vitro drug release profiles of the formulation obtained before and after stability studies were compared. The profiles appeared to be almost super-imposable.

Figure 6: In Vitro release study of optimized formulation before and after stability study



Thus, the most satisfactory formulation of satisfied the physico-chemical parameters, in vitro drug release profile and stability requirements for colon targeted tablets of Secnidazole.

CONCLUSION

In the present study, an attempt was made to design colon targeted compression coated tablets of Secnidazole for treatment of amoebiasis. The main interest in such dosage form was to target the drug to the colon by ensuring minimal amount of drug release in the physiological environment of the upper GI tract. At the outset, Compression coated tablets of Secnidazole were optimized using 3^2- Full factorial design. The amount of HPMC K15M in coat and coat weight chosen as independent variable have significant effect on chosen variable release at 6 h (Y_{6h}), $T_{80\%}$ and difference in percent drug release between 6h and 10h of dissolution of tablet in presence of pectinase enzymes (YD). Optimization process was carried out for the nine batches and optimized formulation was developed. Comparative dissolution profiles of all the batches with pectinase enzymes indicated that as HPMC K15M level increased drug release in the initial hours was retarded. $T_{80\%}$ values for the formulated nine batches showed a wide variation i.e., the response ranged from a minimum of 7 to 16 h. At a lower level of Calcium pectinate, degradation of tablet was fast and hence, premature drug release was observed. However, decreases in the values of Y_{6h} and increases in $T_{80\%}$ clearly indicated the effect of coat weight on drug release. As the coat weight increased, the value of $T_{80\%}$ increased and Y_{6h} decreased. Higher HPMC K15M levels (Formulations F7 to F9) showed slower drug release. Release at 6 h (Y_{6h}) and difference in percent drug release between 6h and 10h of dissolution of tablet in presence of pectinase enzymes (YD) values for formulations F7, F8 and F9 were found 9.06, 4.53 and 1.15% and 39.59, 17.60 and 8.35% with pectinase enzymes respectively. The formulation was intended to release minimum amount of drug in the upper GIT and soon after to release most of the Secnidazole to the colon between 6h and 10h[54]. Hence final selection was conducted from formulation F7, F8 and F9 showing YD values 39.59%, 17.60% and 8.35%, but drug release from formulation F8 and F9 is very slow because of stiff gel formation, which could not be degraded by pectinase enzymes. Therefore formulation F7 was selected as an optimized formulation with YD as maximum. The compression coated Secnidazole tablets coated with Calcium pectinate: HPMC K15M in 90:10 ratios with 450mg coat weight are most likely to provide targeted delivery of Secnidazole to the colon. Accelerated stability study of optimized formulation was performed which showed slight change in the physico-chemical parameters and in vitro drug release study.

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