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Research Article

INFLUENCE OF FORMULATION PARAMETERS ON DISSOLUTION RATE ENHANCEMENT OF PIROXICAM USING LIQUISOLID TECHNIQUE

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ABSTRACT

Objective: This study revealed formulation of a liquisolid system of poorly soluble piroxicam to enhance its dissolution rate. To formulate a liquisolid system loaded with piroxicam, solubility study was carried out in various non-volatile liquids.

Methods: In 1 ml of polyethylene glycol (PEG) 600, 100 mg piroxicam was added and stirred with gentle heating. To the above liquid medication, 1 g microcrystalline cellulose (MCC) 102 (as MCC has given better results), 1 g Syloid 244 FP, 2 g PEG 4000, 500 mg aerosil 200, and 0.255 g sodium starch glycolate (SSG) (5%) were added and mixed properly. The blend was compressed and subjected for quality control parameters.

Results: Among all the non-volatile liquids evaluated, piroxicam was most soluble in PEG 600. Using this as liquid medication, several liquisolid compacts were prepared by varying the ratios of MCC PH 102 as carrier and Syloid 244FP as coating material and evaluated for precompression studies. To further accelerate the release of drug, various additives were added in the formulation. Among them, PEG 4000 has shown better flow as well as compression properties. Hence, the final formulation (LS-16B) was prepared using a combination of MCC PH 102, Syloid 244 FP, PEG 4000 and SSG as superdisintegrant. The dissolution studies revealed that about 92.18% drug got released from liquisolid compacts in 120 minutes, whereas only 68.16% release was observed for pure piroxicam. X-ray diffraction and scanning electron microscopy images revealed the successful formation of liquisolid system.

Conclusion: It was concluded that dissolution rate of poorly soluble piroxicam could be enhanced using liquisolid technique.

Keywords: Piroxicam, Polyethylene glycol 600, Microcrystalline cellulose PH 102, Syloid 244 FP, Polyethylene glycol 4000.

INTRODUCTION

Dissolution plays an important role as a routine quality control test, for characterization of quality of dosage forms, for accepting product similarity under scale-up and post-approval changes related changes, for waiving bioequivalence requirements for lower strengths of a dosage form, and supports waivers for other bioequivalence requirements [1]. It involves mainly two steps: The liberation of the drug from the formulation matrix (disintegration) followed by solubilization of the drug particles in the liquid medium. Thus, the overall dissolution depends on the slower of these two steps. In the first step of dissolution, the cohesive properties of the formulated drug play a key role. Hence, if the first step of dissolution is rate-limiting, then the rate of dissolution is considered disintegration controlled.

In the second step of dissolution, the physicochemical properties of drug such as its chemical form (e.g., salt, free acid, free base) and physical form (e.g., amorphous or polymorph and primary particle size) plays an important role. If this latter step is rate-limiting, then the rate of dissolution is dissolution controlled [2,3]. This is the case for most poorly soluble compounds in immediate-release formulations.

Recent advanced technologies such as combinatorial chemistry and high-throughput screening have led to discovery of new drugs with good pharmacological activities [4,5]. About 35-40% of the drugs synthesized using these technologies have poor aqueous solubility [6]. The solubility of a drug not only determines the dissolution behavior of an active pharmaceutical ingredient (API) in the formulation, but it also affects the absorption as well as therapeutic efficacy of the drug. Some commonly used physical modifications to enhance the dissolution of API includes: (a) Reducing particle size to increase surface area, thus increasing dissolution rate of drug [7,8]; (b) solubilization in surfactant systems [9]; (c) formation of water soluble complexes [3]; (d) drug derivatization such as a strong electrolyte salt form that usually has higher dissolution rate, and (e) manipulation of solid state of drug substance to improve drug dissolution, i.e., by decreasing crystallinity of drug substance through formation of solid solutions [10-12]. The most common method is to increase surface area of the drug by micronization. However, in practice, the effect of micronization is often disappointing, especially when the drugs are encapsulated or tableted [5]. Micronized drugs also have the tendency to agglomerate as a result of their hydrophobicity, thus reducing their available surface area [5].

Although these multiple methods can overcome the problem of low solubility issue, they fail to provide cost effective technique due to the involvement of sophisticated machinery, advanced preparation techniques, and complicated technology [13].

Liquisolid technique is a recent approach that has emerged as a promising strategy for enhancing the release of poorly soluble drugs [14-20]. Liquisolid systems are composed of a non-volatile liquid vehicle having good solubility in water, drug, solid carrier, and coating materials [14-20]. The liquid portion in the formulation may be a liquid drug or a drug suspension or a drug solution in a suitable non-volatile liquid vehicle. The liquid vehicle is popularly called liquid medication. The liquid medication is adsorbed on the surface of a porous carrier (e.g., microcrystalline cellulose [MCC], hydroxy propyl methyl cellulose [HPMC], neusilin etc.). Once the carrier gets completely saturated with the non-volatile liquid, addition of coating material turns it into a dry, free flowing powder with good compressibility characteristics. The enhanced dissolution profile achieved by this technique can be

attributed to increased surface area and favorable wettability of the drug particles in the non-volatile liquid [15]. The increased drug solubility, in turn, provides an improved drug absorption in the gastrointestinal tract (GIT) thereby improving the bioavailability of the drug [16].

Piroxicam is an oxicam derivative with potent nonsteroidal anti-inflammatory activity [15]. Its use is reported for various acute and chronic musculoskeletal and joint disorders such as ankylosing spondylitis, osteoarthritis and rheumatoid arthritis and in acute gout, dysmenorrhea, and sometimes for pain associated with inflammation [21]. For poorly soluble, highly permeable (Class II) drugs (like piroxicam), the rate of oral absorption is often controlled by the dissolution rate in the GIT [22]. Therefore, together with permeability, the solubility and dissolution behavior of a drug are key determinants of its oral bioavailability.

This undesired property may also increase the amount of GI damage, due to long contact of drug with the mucous of GI. Thus, it is an ideal candidate for testing the potential of rapid-release liquisolid compacts.

METHODS

Materials

Piroxicam was gifted by Apex Healthcare Ltd., Ankleshwar, India. HPMC 50 cps, poly vinyl pyrrolidone (PVP) K-25 and 30, lactose and polyethylene glycol (PEG) 200, 600, 4000, 6000 and 35000, Aerosil 200, sodium starch glycolate (SSG), Span 20, Tween 80 and 60 were procured from Central Drug House (P) Ltd., New Delhi, India. MCC 102 was purchased from Jackson Pharmaceuticals, Amritsar, India. Methanol, hydrochloric acid and sodium hydroxide were purchased from Loba Chemie, Pvt. Ltd., Mumbai, India. Syloid® 244 FP was provided as gift sample by Grace Material Sciences, Mumbai, India.

Solubility studies

Piroxicam (50 mg) was dispersed in 2 mL each of PEG 600, PEG 200, Tween 80, Tween 60, Span 20, and water, each in 10 mL volumetric flask. These flasks were shaken using mechanical shaker for 48 hrs at 25°C under constant agitation of 100 rpm. Solutions were centrifuged at 4000 rpm (using REMI CM 12 Plus, India). The supernatant was collected, and suitable dilutions were made using methanol. The diluted samples were analyzed using ultraviolet-visible double beam spectrophotometer at 344 nm. The study was carried out in triplicate, and mean data was recorded.

Screening of excipients

The study revealed that maximum solubility of piroxicam was observed in PEG 600 (please refer results and discussions). Hence, the solution of piroxicam in PEG 600 hereafter will be called liquid medication. To convert liquid medication into free flowing powder and to get compressed into tablet dosage form two different carriers - Lactose and MCC PH102 and four different additives - HPMC, PEG 35000, PVP K-30 and PVP K-25, were evaluated for their adsorption potential. Hence, in 1 mL of liquid medication, weighed quantity of MCC PH 102/lactose (carrier) were added till a good flow of powder was achieved. The loading factor/capacity of each batch containing MCC PH 102/lactose was calculated with and without the addition of additives. The liquid loading factor (Lf) was calculated as per the formula given in Equation 1. The formula composition is given in Table 1.

$$Lf=W/Q \quad (1)$$

Where, W=Weight of liquid medication (g)

Q=Weight of carrier used (g).

To further improve the flow as well as other precompression parameters, Aerosil 200 and Syloid® 244 FP were used as coating material. These coating materials were used in different ratios with respect to carrier material and the ratio of carrier to coating (R) was also calculated.

Determination of drug content in liquisolid powder samples

Piroxicam content in the dried samples was determined by dissolving 100 mg of liquisolid sample in 100 mL of phosphate buffer solution (pH 7.5±0.1), stirring the solution on a magnetic stirrer (400 rpm) at room temperature for 24 h, filtering, and analyzing spectrophotometrically at 344 nm. Each sample was prepared and analyzed in triplicate.

Flow properties of liquisolid powders [23]

Flow properties of the powders were evaluated by determining the angle of repose. Static angle of repose was measured according to the fixed funnel and free standing cone method. A funnel with the end of the stem cut perpendicular to the axis of symmetry is secured with its tip 10 cm height, H, above a graph paper placed on a flat horizontal surface. The powders were carefully poured through the funnel until the apex of the conical pile so formed just reaches the tip of the funnel. The mean diameter (2R) of base (H) of the powder cone was determined, and the tangent of the angle of repose was given by Equation 2.

$$\tan \alpha=h/r \quad (2)$$

Where α is the repose angle.

The angle of repose, Carr's index and Hausner's ratio of the above powder were determined. Similarly, different batches were obtained, and selected batches were compressed into 10 mg tablets.

Effect of disintegrant

To check the effect of disintegrating agent on the disintegration time of the liquisolid tablets, different powder blends were prepared - In one of the batch 5% SSG was added while the other batch was prepared in the absence of SSG.

Table 1: The formula composition of various liquisolid formulations (LS-1 to LS-11)

Formulation batch	MCC/PH 102 (carrier) (g)	Amount of PEG 600 (g)	Lf (without additives) (Mean±SD)*	PVK 30 (g)	HPMC 50 cps (g)	PEG 4000 (g)	PEG 6000 (g)	Lf (with additives) (mean±SD)*	Syloid 244FP (coating) (g)	Carrier/coating ratio R value (mean±SD)*
LS-1	2.25	1.12	0.49±0.006	1.125	-	-	-	0.332±0.038	0.4	5.625±0.36
LS-2				2.25	-	-	-	0.248±0.023	0.4	
LS-3				3.5	-	-	-	0.196±0.018	0.4	
LS-4				3.374	-	-	-	0.199±0.001	0.4	
LS-5				-	1.125	-	-	0.332±0.008	0.4	
LS-6				-	2.25	-	-	0.248±0.01	0.4	
LS-7				-	2.812	-	-	0.221±0.038	0.4	
LS-8				-	3.374	-	-	0.199±0.056	0.4	
LS-9				-	-	1.125	-	0.332±0.065	0.4	
LS-10				-	-	2.25	-	0.248±0.082	0.4	
LS-11				-	-	-	2.25	0.248±0.018	0.4	

*(Mean±SD)=Mean (±SD) of triplicate studies, SD: Standard deviation

Preparation of optimized formulation

In 1 mL of PEG 600, 100 mg piroxicam was added and stirred with gentle heating. To the above liquid medication, 1 g MCC 102 (as MCC has given better results), 1 g Syloid 244 FP, 2 g PEG 4000, 500 mg Aerosil 200, and 0.255 g SSG (5%) were added and mixed properly. Powder blend was passed through sieve no. 22 several times to achieve uniform mixing. The above blend was compressed into 10 tablets each having weight of 574 mg (each containing 10 mg of piroxicam). Resulting tablets were subjected to different quality control tests.

Characterization and evaluation of piroxicam liquisolid tablets

Drug content determination [23,24]

The drug content of the tablets was measured according to Indian Pharmacopoeia 2010. For the purpose of drug content determination, ten liquisolid tablet containing 10 mg piroxicam were taken and triturated in a mortar. From this, an amount equivalent to 10 mg was taken and dissolves in 10 mL of methanol. A volume of 1 mL of this liquid was pipetted out, and volume made up to 10 mL with methanol. Again 1 mL was pipetted out from this solution and it was diluted up 10 mL with Methanol. The dilution was filtered, and the drug content was determined at 344 nm, spectrophotometrically.

Friability test [23,24]

The % friability of the prepared liquisolid tablets was measured using Roche Friabilator (Electrolab, India). Previously, weighed tablets (20 tablets) were placed in the friabilator and it was rotated at 25 rpm for 4 minutes (100 rotations). At the end of test, the tablets were again weighed; loss in the weight of tablet is the measure of friability and is expressed in percentage as:

$$\% \text{ Friability} = [(W1 - W2)/W1] \times 100$$

Where W1=Initial weight of 20 tablets, W2=Weight of the 20 tablets after testing.

Disintegration test [24]

Six tablets were taken randomly from the prepared optimized batch and placed in the United State Pharmacopoeia (USP) disintegration apparatus (baskets type) containing purified water. Apparatus was run and time taken for all the tablets to disintegrate was noted down.

Weight variation test [24]

To study the weight variation, twenty liquisolid tablets of piroxicam were taken, and their weight was determined individually and collectively on a digital weighing balance. The average weight of one tablet was determined from the collective weight. The weight variation test is a satisfactory method of determining the drug content uniformity. The percent deviation was calculated using the following formula.

$$\% \text{ Deviation} = (\text{Individual weight} - \text{Average weight}/\text{Average weight}) \times 100$$

In vitro dissolution studies

In vitro dissolution profile of piroxicam liquisolid compacts was carried out USP-II (paddle type) apparatus. The dissolution study was carried out in 900 mL of 0.1 N HCl (1.2 pH) at 37°C±0.5°C and 50 rpm. Then, 5 mL samples were collected at 5, 10, 15, 20, 30, 60, 90, and 120 minutes. The dissolution medium was replaced with 5 mL fresh 0.1N HCl to maintain the sink condition. The withdrawn samples were filtered and analyzed spectrophotometrically at 344 nm. Mean percentage drug released was calculated using the standard plot of piroxicam.

Scanning electron microscopy (SEM)

SEM was carried out as reported in [25]. SEM is utilized to assess the morphological characteristics of the raw materials and the drug-carrier systems [26]. In this, the surface morphology of pure piroxicam, uncompressed powder blend, and compressed powder blend containing piroxicam were determined using SEM. A metallic stub with double-sided conductive tape of 12 mm diameter was taken and the samples were fixed over it. A Supra 35 VP (Oberkochen, Zeiss, Germany) data station with acceleration voltage of 1.00 kV and a secondary detector was used in this study.

Powder X-ray diffraction (PXRD) analysis

PXRD patterns of pure piroxicam, uncompressed powder blend, and compressed powder blend containing Piroxicam were recorded using an X-ray diffractometer (Bruker Axs, D8 Advance) with Cu line as the source of radiation. Standard runs using a 40-kV was crimped separately in an aluminum pan. Each sample was heated 0 to 300 °C at a heating rate of 10 °C/minutes under a stream of nitrogen at a flow rate of 50 mL/minutes. An empty aluminum pan was used as reference. The melting points (Tm) were determined using TA-Universal Analysis 2000 Software (Version 4.7A).

RESULTS AND DISCUSSIONS

Solubility studies

The study revealed that solubility of Piroxicam was found maximum in PEG 600 (i.e., 45.74 %). Therefore, it was selected as non-volatile solvent in the preparation of piroxicam liquisolid tablets. The result of solubility studies are shown in Fig. 1.

Optimization of excipients

The flowability and compressibility of different excipients were checked by measuring angle of repose, Carr's index and Hausner's ratio. The results are shown in Table 2. Initially, PVP K-30 gave good angle of repose but as its concentration was increased it started becoming sticky and decrease in flowability of powder blend took place. Powder mixture containing PEG 4000 showed best flowability with angle of repose 26.56°. Hence, it was selected as additives for the preparation of piroxicam liquisolid tablets. The loading factor obtained was 0.49 (without additive), 0.332, 0.248, 0.196, 0.199 (with PVK-30), 0.332, 0.248, 0.221, 0.199 (with HPMC 50 cps), 0.332, 0.248 (with PEG 4000), and 0.248 (with PEG 6000). It is important to note that lactose did not provide good flow to any of the formulations prepared with it.

As formulation batch, LS-9 and LS-10 containing PEG 4000 showed the best flow characteristics, PEG 4000 was selected as an additive for further studies.

Using PEG 4000, different batches (LS-12 to LS-18) were prepared and evaluated for precompression studies. It was observed that, formulation LS-16, containing MCC 102: Syloid 244FP: PEG 4000 ratio 1:1:2 gave the best result regarding angle of repose; hence, this ratio was selected for formulation of final liquisolid tablets. The results are shown in Table 3.

Effect of superdisintegrant

Two different batches of LS-16 were prepared. In one batch SSG was added (i.e., LS-16B) and to other batch SSG was not added (i.e., LS-

Table 2: Evaluation of flow properties of liquisolid formulations

Formulation batch	(Mean±SD)*		
	Angle of repose (θ)	Carr's index	Hausner's ratio
LS-1	35.44±1.18	-	-
LS-2	Clogging of funnel	-	-
LS-3	Sticky	-	-
LS-4	Sticky	-	
LS-5	37.94±1.56	-	-
LS-6	38.88±0.94	-	-
LS-7	37.01±0.88	-	-
LS-8	36.86±1.44	31.25±0.94	1.45±1.14
LS-9	28.07±0.34	31.36±1.38	1.28±0.86
LS-10	26.56±1.34	37.5±1.66	1.6±0.63
LS-11	37.47±1.88	38.8±1.46	1.6±0.24

*(Mean±SD)=Mean (±SD) of triplicate studies, SD: Standard deviation

16A). It was observed that LS-16B, in which SSG was added as superdisintegrant had shown better disintegration as compared to LS-16A as in Table 4.

Quality control tests of final piroxicam liquisolid tablets

In weight variation test, the pharmacopoeial limit for the tablets is not to be more than 5% of their average weight. The mean hardness of liquisolid formulation LS-16A and LS-16B was determined and revealed that the liquisolid tablet formulation had shown acceptable hardness. All the liquisolid tablets had acceptable friability as none of the tested formulation had percentage loss in tablets weights that exceeded 1% moreover, cracking of tablets was also not observed. Since all the prepared batches met the standard friability criteria, they were expected to show acceptable durability and withstand abrasion in handling, packaging, and shipment. In general, formulation should be directed at optimizing tablet hardness without applying excessive compression force, while at the same time assuring rapid tablet disintegration and drug dissolution. In other words, tablet should be sufficiently hard to resist breaking during normal handling and yet soft enough to disintegrate properly after swallowing. The disintegration time for all the liquisolid tablets was found to be 2.8±0.09 minutes. The % drug content in all the liquisolid tablets was found to be 57.83% (Table 5).

The % weight variations of all the piroxicam liquisolid tablets were below 5%, indicating that the content present in the tablets are within limit and uniform (Table 6). Average weight of 20 tablets=571 mg.

Dissolution studies

The cumulative mean percent release of piroxicam from liquisolid compacts and pure piroxicam is shown in Fig. 2. It was observed that about 50% drug got released from the liquisolid tablets within 30 minutes, whereas only 38% release was observed in case of pure piroxicam. More than 75% drug got released within 90 minutes from the liquisolid tablet. The pure API showed only 68.16% release within 120 minutes. Hence, the dissolution study revealed that release of piroxicam got enhanced by the formulation of liquisolid compacts.

SEM

The SEM revealed smooth circular and flat crystals of pure piroxicam (Fig. 3a) with irregular edges, having particles in the size range of 0.8-1.3 µm. Whereas, the uncompressed physical mixture of LS-16B formulation revealed the complete loss of crystal structure of the drug (Fig. 3b), with oozing out waxy appearance. The waxy appearance reveals the presence of PEG-600 as liquid medication. Moreover, from the loss of structure of drug, it can be concluded that the drug has got

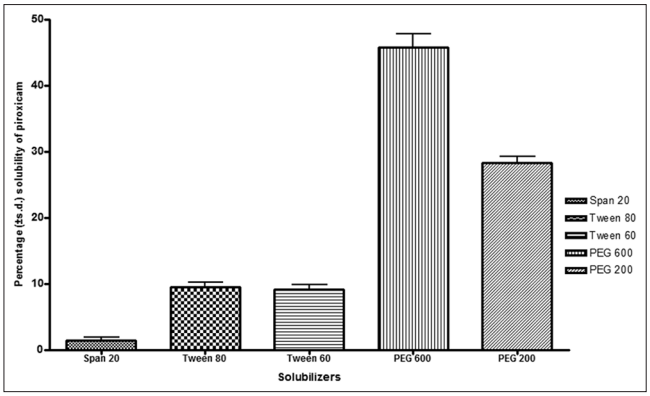

Fig. 1: % Solubility of piroxicam in different non-volatile solvents

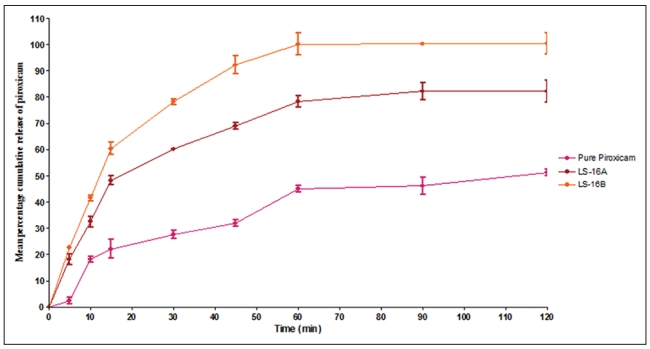

Fig. 2: Mean percentage release piroxicam from liquisolid tablets with respect to pure active pharmaceutical ingredient

Table 3: Evaluation of pre-compression parameters of different batches

Batch no.	MCC 102 (g)	PEG 600 (g)	Lf (without PEG 4000)	PEG 4000 (g)	LF (with PEG 4000)	Syloid 244 FP (g)	Carrier/coating ratio R value	(Mean±SD)*			
								Angle of repose (θ)	Carr's index	Hausner's Ratio	Hardness (N)
LS-12	1	1.12	1.12	1	0.56	1	1	27.75±0.85	23.07±1.96	1.30±0.22	4±0.001
LS-13	2	1.12	0.56	1	0.373	1	2	26.56±1.12	28.51±2.16	1.38±1.96	Failed during compression
LS-14	1	1.12	1.12	1	0.56	2	1	26.56±0.94	29.16±1.42	1.41±2.18	Failed during compression
LS-15	2	1.12	0.56	1	0.373	2	1	26.51±1.76	34.61±2.38	1.52±3.12	5±0.023
LS-16	1	1.12	1.12	2	0.373	1	1	24.90±2.24	28.57±3.12	1.4±1.94	4±0.41
LS-17	2	1.12	0.56	2	0.28	1	2	26.56±1.88	31.25±1.18	1.36±2.22	4±0.68
LS-18	1	1.12	1.12	2	0.373	2	0.5	26.45±0.44	30.71±1.84	1.44±3.12	2±0.18

*(Mean±SD)=Mean (±SD) of triplicate studies, SD: Standard deviation

Table 4: Effects of disintegrating agent (SSG) on different parameters

Batch no. (g)	MCC 102 (g)	Syloid 244 FP (g)	PEG 4000 (g)	Aerosil 200 (g)	SSG (g)	Mean±SD*				Friability	% Drug content	Mean±SD*	
						Carr's index	Hausner's ratio	Angle of repose	Hardness (N)			Disintegration time (minutes)	Dissolution time (minutes)
LS-16A	1	1	2	0.5	-	29.88±0.16	1.42±0.94	24.88±0.009	4±0.008	-	-	10±0.31	>25±1.20
LS-16B	1	1	2	0.5	0.132	29.88±0.34	1.42±0.034	24.88±0.46	2.5±0.18	0.59	87.83±1.6	2.5±0.09	17±2.40

*(Mean±SD)=Mean (±SD) of triplicate studies. SD: Standard deviation, SSG: Sodium starch glycolate

Table 5: Evaluation parameters of piroxicam liquisolid tablets

Formula	Mean hardness (N) (mean±SD)*	Friability		Mean±SD*		
		Fine % (mean±SD)*	No. of broken tablets	Drug content (%)	Disintegration time (minute)	% Release at 5 minutes
Batch no. 2	3.3±0.16	0.59±0.006	None	57.83±3.16	2.8±0.09	22.72±0.18

*(Mean±SD)=Mean (±SD) of triplicate studies. SD: Standard deviation

Table 6: Percentage weight variation in piroxicam liquisolid tablets

S. no.	Individual wt. (mg)	% wt. variation (mean ± SD)*	S. No	Individual wt. (mg)	% wt. variation (mean ± SD)*
1	574	0.525 ± 0.018	11	558	2.27 ± 0.56
2	569	0.35 ± 0.072	12	564	0.7 ± 0.038
3	570	0.175 ± 0.054	13	550	3.67 ± 0.016
4	576	0.875 ± 0.068	14	570	0.175 ± 0.032
5	564	0.70 ± 0.045	15	563	1.4 ± 0.54
6	570	0.175 ± 0.056	16	569	0.35 ± 0.38
7	569	0.525 ± 0.038	17	563	1.4 ± 0.86
8	559	2.1 ± 0.054	18	556	2.62 ± 0.94
9	567	0.7 ± 0.082	19	561	1.75 ± 0.78
10	573	0.55 ± 0.016	20	570	0.175 ± 0.052

*(Mean ± SD)=Mean (±SD) of triplicate studies. SD: Standard deviation

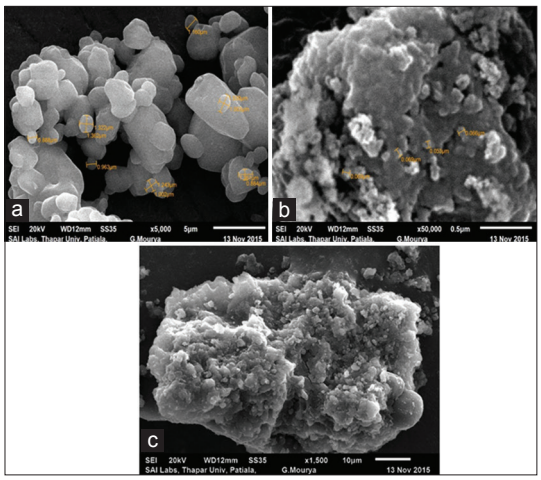

Fig. 3: Scanning electron microscopy images of pure piroxicam (a), uncompressed physical mixture (b), and LS-16B (c)

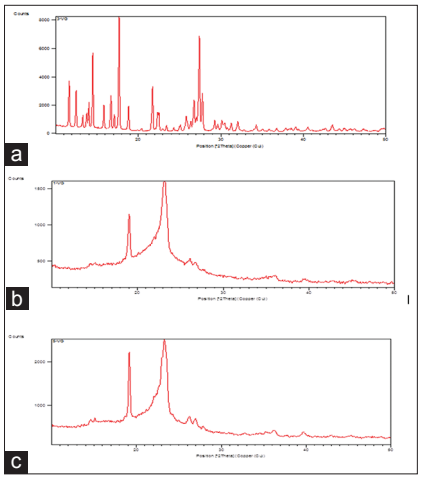

Fig. 4: X-ray diffraction diffractograms of pure piroxicam (a), uncompressed physical mixture (b), and LS-16B (c)

completely solubilized in the liquid medication. Similar observations were inferred in case of the compressed formulation as that of its uncompressed mixture (Fig. 3c). The results are further confirmed by XRD studies.

PXRD studies

The diffraction pattern revealed sharp crystalline peaks of pure piroxicam (Fig. 4a) with major diffraction angles of 14.52, 17.71, 18.85, and 21.76 degrees, respectively. Whereas the uncompressed physical mixture of LS-16B formulation and its compressed form revealed the complete loss of crystal structure of the drug (Fig. 4b and c). This could be understood by the complete loss of diffraction peaks.

CONCLUSION

This study revealed successful formulation of a liquisolid system loaded with piroxicam to enhance its dissolution rate. Final formulation (LS-16B) was prepared by dissolving the drug into PEG 600 followed by its adsorption on solid carriers and coating materials comprising a combination of MCC PH 102, Syloid 244 FP, and PEG 4000. SEM and XRD reports revealed complete solubility of piroxicam into PEG 600. The dissolution studies revealed that about 92.18% drug got released from liquisolid compacts in 120 minutes, whereas only 68.16 % release was observed for pure piroxicam. Hence, it could be completed that the dissolution rate of piroxicam has been successfully improved by the formulation of liquisolid compacts.

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