Available on line www.jocpr.com

Journal of Chemical and Pharmaceutical Research

J. Chem. Pharm. Res., 2010, 2(1): 79-82

ISSN No: 0975-7384

Release Studies of Ketoprofen Niosome Formulation

Arora Rajnish*, Sharma Ajay**

**Public Health Training Institute, SMS Hospital Campus, Jaipur (Rajasthan)*
*** Head, Department Of Chemistry, Govt PG College, Sirohi (Rajasthan)*

Abstract

Anti-inflammatory drug ketoprofen was encapsulated in niosome for topical application. Ketoprofen niosome were prepared by thin film hydration method technique using surfactant, cholesterol, dicetyl phosphate & drug mixture in different weight ratios. The prepared niosomes were characterized by various physicochemical parameters & evaluation of release studies of entrapped ketoprofen in niosomes were carried out by UV Visible spectrophotometric method.

Key Words: NSAID, Diacetyl Phosphate, Sorbitan Esters, UV-Visible Spectrophotometry.

Introduction

Niosomes are surfactant vesicles which are used to entrap several pharmaceutical drugs to enhance their sustainability [1]. The present research is attempt towards development of topical application of ketoprofen niosomes[2] so that drug will reach to target site with enhance sustainability & stability[3]. The novelty of research work is to provide effective and maximize drug concentrations and therapeutic value.

Materials and Methods

Sorbitan Esters-20, 40, 60 & 80 & Cholesterol were purchased from Thomas Baker Co Limited. Dicetyl phosphate was purchased from Sigma-Aldrich USA. Ketoprofen Sample was gifted from Menarni Raunaq Pharmaceuticals Limited. All other Chemicals and solvents were of analytical or pharmacopoieal grade.

(a) Method of Preparation: Multi lamellar vesicles of ketoprofen were prepared by thin film hydration Techniques using rotary flash evaporator. The niosome were prepared by using Cholesterol, dicetyl phosphate &surfactant mixture. The effect of various processes variables such as speed of rotation, vacuum, temperature and hydration time was altered and the effect on the formation of uniform thin film of surfactant was evaluated

(b) Evaluation: Niosomes were prepared by taking various ratios of surfactant, cholesterol & dicetyl Phosphate mixture using solvent diethyl ether .This solution is then transferred to round bottom flask and rotated by a buchi type rotary type flash evaporator. The solvent is recovered back by applying vacuum leaving a thin film of multilamellar vesicles to the periphery of rbm. This thin film is then hydrated with taking 10 mg of drug with 10 ml of PH 5.5 Phosphate buffer keeping the speed of rotation & temp of water bath constant. The percentage drug entrapment was evaluated and unentrapped drug was dialyzed by using sphedex gel chromatographic method[4,5].

(c) *In-Vitro* release study: Drug release/ diffusion studies were carried out by using an apparatus like one side open glass tube with a diameter of 25 mm and diffusional area of 4.9 cm2, regenerated Cellulose acetate membrane (Thickness 60-65 micrometer and pore size(0.45) was sandwiched between the lower cell reservoir and the glass cell top containing the niosomal sample and secured in place with a pinch clamp. The receiving compartment volume 30 ml was filled with PH 5.5 Phosphate buffer. The system was maintained at 37 +/- 0.5 degree centigrade **by** magnetic heater resulting in a membrane surface temp of 32 degree. The niosome sample was placed evenly on the surface of the membrane in the donor compartment.[6] Two ml of receptor fluid were withdrawn from the receiving compartment at 1, 2,3,4,5,6,8,10 &12 hours and replaced with two milliliter of fresh solution. Sample were assayed by visible spectrophotometric method at lambda max of 260 nm.[7,8]

Result and Discussion

Span 20 & 80 does not form a thin & dry film at rbf [6]. These Spans are not used further in the research or experimental investigations. Only Span 40 & 60 were used to carry out further investigations. The entrapped drug surfactant mixture was taken with a different molar ratio as given below:

Table-1: Release Pattern of noisome ketoprofen preparation in PH5.5 Phosphate Buffer- (% release)

Serial No	Sample	Ratio(Drug+Surfactant SPAN60+Cholestrol)	% Drug Entrapment
1.	Kf.1	1 1 1	65.34 +/- 0.78 %
2.	Kf.2	1 1.5 1	67.56 +/- 0.34 %
3.	Kf.3	1 2 1	78.90 +/- 0.56 %
4.	Kf.4	1 2.5 1	66..67 +/- 0.76 %
5.	Kf.5	1 3 1	64.23 +/- 0.66 %

Table-2

SAMPLE/ TIME	Kf.1	Kf.2	Kf.3	Kf.4	Kf.5
0 hr	0.00	0.00	0.00	0.00	0.00
1 hr	11.12	9.90	07.15	07.50	10.23
2 hr	19.04	15.21	13.14	14.25	16.27
3 hr	24.50	23.51	17.42	19.15	25.15
4 hr	30.06	29.82	20.78	25.95	32.45
5 hr	39.45	33.65	24.12	29.25	37.08
6 hr	45.23	40.35	28.40	32.85	42.25
8 hr	52.89	45,78	34.55	38.22	48.11
10 hr	57.67	50.67	42.87	51.78	53.55
12 hr	59.07	52.56	43.42	54.56	57.55

Table-3: Release Pattern of noisome ketoconazole preparation in PH5.5 Phosphate Buffer- (% release)

Serial No	Sample	Ratio(Drug+Surfactant SPAN40+Cholestrol)	% Drug Entrapment
1.	Kf.1	1 1 1	60.34 +/- 0.45 %
2.	Kf.2	1 1.5 1	63.89 +/- 0.80 %
3.	Kf.3	1 2 1	70.76 +/- 0.65 %
4.	Kf.4	1 2.5 1	61.32 +/- 0.88 %
5.	f.5	1 3 1	58.67 +/- 0.55 %

Table-4

SAMPLE/ TIME	Kf.1	Kf.2	Kf.3	Kf.4	Kf 5
0 hr	0.00	0.00	0.00	0.00	0.00
1 hr	13.99	12.10	10.08	11.88	12.90
2 hr	20.75	19.05	16.29	19.89	20.76
3 hr	29.55	24.05	21.98	26.00	27.99
4 hr	35.86	27.66	26.11	30.34	28.95
5 hr	40.15	30.75	32.66	34.12	36.85
6 hr	42.11	37.68	36.14	38.44	42.75
8 hr	47.77	43.22	38.00	44.75	48.00
10 hr	49.76	45.43	39.58	47.86	50.34
12 hr	50.01	46.76	40.98	49.90	51.67

Conclusion

It has been concluded that niosome prepared from span 60 has much more entrapment efficiency as compare to span 40. Drug releases slowly and sustained manner from span 60 ketoprofen niosome (Sample no-Kf 3) as compare to Span 40 niosome.

Acknowledgements

The author wishes to thanks Menarni Raunaq Pharmaceuticals, New Delhi for providing gift sample of sample drug Ketoprofen.

References

[1] Baillie, A.J., Florence,A.T., Hume,L.R., Muirhead,G.T., Rogerson,A., *Int. J. Pharm.,* 2002, 234, 237-248.
[2] Uchegbu, I.F., Florence, A.T., *Adv. Coll. Interf. Sci.*, 1995, 58, 1-55.
[3] Bhalla H.L, Shah A. *Indian Drugs*, 1991, 28(9), 420-422.
[4] Biswal. S., Murthy. P.N., *Int.J.Pharm. & Nanotech,* 2008, 1(1), 1-8.
[5] Chandrakar S., Saraf.S. *Research J. Pharma Dosage Forms Techs*, 2009; 1(1); 1-4.
[6] Shahiwala, A., Misra.A, *J Pharm Pharm.Sci,* 2002, 5(3), 220-225.
[7] Arida I .Adi. Al-Tabakha.M, *Euro J Pharm. & Biopharm.,* 2007, 66, 48-54.