Delfina Hanus et al., Pharm Anal Acta 2019, Volume 10
DOI: 10.4172/2153-2435-C3-052

Preparation of Piroxicam-2-hydroxypropyl-α-cyclodextrin system and studies of solubility changes of Piroxicam

Delfina Hanus, Karina Grzanka, Mikołaj Mizera, Hab N Farm and Judyta Cielecka-Piontek
Poznan University of Medical Sciences, Poland

Introduction & Aim: Piroxicam is a non-steroidal and anti-inflammatory drug. The effect of this drug is based on prevention of the prostaglandin production via. inhibition of cyclooxygenase. This drug is indicated for treatment of rheumatoid osteoarthritis, postoperative pain. The drug is absorbed slowly and gradually by oral and rectal administration.

Method: Piroxicam is poorly soluble in water and in biological fluids at physiological pH values. Systems of cyclodextrin and Piroxicam were prepared in solid state using the co-precipitation method. The procedure requires stirring together methanol solution of Piroxicam and water solution of cyclodextrin in different ratios: 1:1 and 1:2. The identification of cyclodetrin-piroxicam systems was based on changes on FT-IR spectra as well as DSC diffractograms. The changes of solubility of Piroxicam after its incorporation into CD were examined using paddle apparatus in 0,1M HCl, medium simulating conditions in stomach. Sample solutions collected from dissolution testing were measured by UV spectroscopy to observe the changes of solubility of the Piroxicam.

Results: Apparent solubility studies showed that Piroxicam in cyclodextrin system in ratio 1:1 after 165 minutes was solvated in 85% and in ratio 1:2 in 69% while the Piroxicam in free form was solvated in 62%. Similarity factors f1 for the first study was 0,4232 while difference factor f2 was 0,0205 and for the second f1 was 0,1507 and f2 was 0,5772.

Conclusion: Systems of cyclodextrin with Piroxicam in ratio 1:1 increased solubility of investigated molecule. Statistical evaluation proves that two apparent solubility curves are significantly different. The other inclusion system also increased solubility of Piroxicam and values of f1 and f2 proves that two apparent solubility curves are slightly different. According to apparent solubility study, same concentration of the Piroxicam is reached faster when it is systems with CDs.

The studies were supported by Ministry of Science and Higher Education from project "Best of The Best 3.0"

References:

1. Charumanee S, Okonogi S, Sirithunyalug J, Wolschann P, Viernstein H (2016) Effect of cyclodextrin types and co-solvent on solubility of a poorly water soluble drug. Sci Pharm; 84(4): 694-704.

2. Bouchal, M Skiba, N Chaffai, F Hallouard, S Fatmi, M Lahiani-SkibaFast (2015) Dissolving cyclodextrin complex of Piroxicam in solid dispersion Part I: Influence of β-CD and HPβ-CD on the dissolution rate of Piroxicam. International Journal of Pharmaceutics; 478: 625-632.

Biography

Delfina Hanus is a student of the fifth year of pharmacy at the Poznań University of Medical Sciences. She is a Member of the Scientific Academic Circle Herba and conducts research on the possibilities of modifying the release rate of Piroxicam from complexes obtained by co-precipitation. She has knowledge and experience in the scope of planned tasks to be implemented in these areas of the project.

delfina.ha@gmail.com

Notes: