

Title: The study of the effect of hydrophilic biopolymers on the permeability of piroxicam through the biological membrane system in the gastrointestinal tract

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Piroxicam is a non-steroidal anti-inflammatory drug characterized by analgesic and antipyretic effects. The action of the drug is based on the prevention of the production of prostaglandins. From the gastrointestinal tract piroxicam is rapidly absorbed, reaching a maximum concentration in the blood after 3 to 5 hours. According to the Biopharmaceutic Drug Classification System (BCS) piroxicam is a II class drug characterized by low solubility and high permeability. The aim of the study was to assess the effect of permeation through biological membranes as a result of improved solubility of piroxicam, after its combination with 2-hydroxypropylo-α-cyclodextrin. Cyclodextrins systems with piroxicam were preparated by using method of co-precipation of two solutiones: piroxicam in methanol and 2-hydroxypropylo-α-cyclodetrin in water in ratio 1:1 and 1:2. The identification of cyclodextrin systems was conducted by using FT-IR spectroscopy and DSC calorimetry. The reasearches of permeability were carried out on the parallel artificial membrane permeability assay (PAMPA) for GIT model. The changes of concentration of piroxicam in acceptor and donor solvent were measurments by UV spectroscopy.
Apparent permeability coefficients (Papp) of piroxicam through gastrointestinal barrier was $4{,}28*10^{-6}$ cm*s^{-1} in free forms which determine it as high permeable. Papp of piroxicam system with 2-hydroxypropylo-α-cyclodextrin in ratio 1:1 was $16{,}0*10^{-6}$ cm*s^{-1} and with 2-hydroxypropylo-α-cyclodextrin in ratio 1:2 was $8{,}86*10^{-6}$ cm*s^{-1}. In relation to literature substances with permeability $>1*10^{-6}$ characterize with high adsorbtion[1].
Analysis of permeability show that proxicam and its inclusion systems characterize high permeability. The studies show that its inclusion systems increases permeability.

[1] Yee S. *In vitro* permeability across Caco-2 cells (colonic) can predict *in vivo* (small intestinal) absorption in man-fact or myth. Pharm Res. 1997;14(6):763–766.

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Biography

Ms. 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. The acquired skills will be used during the study of obtained piroxicam systems with selected hydrophilic biopolymers in terms of modifying dissolution rate and permeability through the biological gastrointestinal membrane system.

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