[PE1-8] [04/21/2000 (Fri) 10:30 - 11:30 / [1st Fl, Bldg 3]]

Development and evaluation of transdermal delivery system containing clenbuterol

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The purpose of this study is to develop and evaluate matrix-type transdermal patch containing clenbuterol. Clenbuterol is a drug which has been used for the treatment of bronchial asthma and chronic obstructive bronchial disease. To develop clenbuterol patch, various adhesives and permeation enhancers were tested for an optimal delivery system. Skin permeation rates of clenbuterol from patches were evaluated using hairless mouse skin and flow-through diffusion cell. Skin permeation rate was found to be dependent on loading dose of the drug in the matrix. Effective skin permeation rate across the hairless mouse skin was obtained from a patch with 1.0 mm thickness and 15% w/w loading dose. Labrafil, Tween 65 and lauryl pyrrolidone were found to produce an effective skin permeation rate of clenbuterol. They enhanced the permeability of clenbuterol depending on concentration in the range from 0% up to 5%. The skin permeation rate of clenbuterol from polyacrylate-based adhesive patch was higher than those from PIB-based adhesive patch. The in vivo percutaneous absorption study using hairless rats showed that the plasma concentration of optimal formulation was high enough to be in the therapeutic concentration range. This study demonstrated a good feasibility of clenbuterol administration through the intact skin using a transdermal patch.

[PE1-9] [04/21/2000 (Fri) 10:30 - 11:30 / [1st Fl, Bldg 3]]

Effect of Vehicles and Enhancers on the Permeation of Ondansetron Hydrochloride through Excised Hairless Mouse Skin

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To develop a transdermal patch of ondansetron hydrochloride (OS), which has been used to prevent nausea and vomiting in emetogenic cancer chemotherapy, the effect of various vehicles and enhancers in solution formulations was evaluated. The permeation study was carried out using a side-by-side permeation system at 32℃. The amount of OS permeated and the solubility of OS were determined by HPLC. The solubility of OS at 32℃ was increased in the rank order of isopropyl myristate (IPM) < propylene glycol laurate (PGL) < propylene glycol monolaurate (PGML) < propylene glycol monocaprylate (PGMC) < diethylene glycol monoethyl ether (DGME) < polyethylene glycol 300 < water (35 ㎎/㎖). Vehicles such as PGMC, DGME, PGL, IPM, ethanol, and water showed different permeation fluxes of OS from their saturated solutions at 1.7±0.8, 3.7±0.07, 0.4±0.11, 0.2±0.1, 45.8±37.9, and 33.8±27.8 ㎍/㎠/hr, respectively. The addition of DGME to PGMC increased the solubility of OS, and the permeation rate of OS from saturated solutions was markedly increased until the ratio of DGME in the binary mixture reached 60%. In a binary vehicle of PGMC/DGME (6:4, v/v), however, penetration enhancers such as linoleic acid, oleic acid, lauric acid, caprylic acid, capric acid, lauryl alcohol or oleyl alcohol were shown not to significantly promote the flux of OS, when compared with the control (10.2±5.1 ㎍/㎠/hr).

[PE1-10] [04/21/2000 (Fri) 10:30 - 11:30 / [1st Fl, Bldg 3]]

Development of Terfenadine-Pseudoephedrine Double layered Tablet

Dissolution-Equivalent to Core Tablet

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The present terfenadine-pseudoephedrine dosage from is the sustained release core tablet composed of outer (fast release) and inner (sustained release) layer. To develop the double layered tablet dissolution-equivalent to core tablet, the fast and sustained release layers were prepared using various disintegrants and polymers, respectively. The layer composed of [terfenadine/pseudoephedrine/lactose/corn starch/sodium bicarbonate/HPC/sodium laurylsulfate/microcrystalline cellulose (60/10/90/30/20/1/40/1/293 mg)], which gave the fast disintegrating time and high dissolved amounts of drugs, was selected as the fast release layer. The dissolved amount of pseudoephedrine from sustained release layers were more increased with smaller ratio of ethylcellulose and HPMC. Dissolution mechanism analysis showed the release of pseudoephedrine was proportional to the square root of time, indicating that drug might be released from the layers by Fickian diffusion. The layer composed of [pseudoephedrine/ethylcellulose/HPMC (110/30/155 mg)], which had the similar dissolution amounts of pseudoephedrine to the inner layer of core tablet, was selected as the sustained release layer. Furthermore, the dissolved amounts of drugs from the core and double layered tablet had the deviation of less than 5% against the average dissolved amounts of drugs at each time, respectively. There was no significant difference between the dissolved amounts of drugs from these tablets at each time in pH 1.2, 4.0 and 6.8, respectively ($P>0.05$). Our results suggest that this double layered tablet was dissolution-equivalent to the core tablet

[PE1-11] [04/21/2000 (Fri) 10:30 - 11:30 / [1st Fl, Bldg 3]]

Evaluation of a polymeric matrix for the controlled release of cefadroxil

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The purpose of this study was to evaluate the efficacy of a polymeric matrix developed for the prevention of bacterial adhesion and growth on its surface by controlled release of antibiotics. Cefadroxil was incorporated into a polyurethane matrix by the solvent casting method. The matrix was then coated with polyurethane in tetrahydrofuran solution. The release of cefadroxil from the matrix into the distilled water at 37℃ was measured by HPLC. The morphological change of matrices before and after release studies was investigated by the scanning electron microscopy (SEM). The duration of antimicrobial activity of matrix against E.coli and S.aureus was evaluated by measuring the diameters of inhibition zone and the optical density of the broth. The matrices were also implanted subcutaneously in rats, and the duration of the antibacterial activity was determined by measuring the inhibition zone. The results showed that the release of cefadroxil from the polymeric matrix was successfully determined by measuring the inhibition zone and the optical density of the broth. It was also possible to determine the duration of the matrix in vivo by implanting the matrix in rats and measuring the inhibition zone. A good relationship was observed among the methods used in this study for the evaluation of the polymeric matrix.

[PE1-12] [04/21/2000 (Fri) 10:30 - 11:30 / [1st Fl, Bldg 3]]

Cyclosporin A adsorption to surfaces and prevention with serum

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