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EFFECT OF ETHANOL, UREA AND OLEIC ACID, ON IN-VITRO GLUCOSAMINE PERCUTANE PENETRATION PROFILE USING FRANZ DIFFUSION CELL

Joshita Djajadisastra, Yahdiana Harahap and Christina
Department of Pharmacy, Faculty of Mathematics and Science, University of Indonesia, Kampus Baru Universitas Indonesia Depok, Depok 16424
E-mail: joshita.djajadisastra@yahoo.com

ABSTRACT

Osteoarthritis is a degenerative disease identified by thinning the cartilage tissue which protect the joints, triggering pain and limiting patient's movement ability. Osteoarthritis therapy is usualy intended for reducing the pain. Patients are given acetaminophene, Non Sterroid Anti Inflamation Drugs or Specific Inhibitor – COX2. These drugs have serious side effects such as hepatotoxic, gastric ulcer and cardiovascular disorder. Glucosamine is an alternative pharmacological therapy for osteoarthritis, but it was reported that oral glucosamine provides low bioavailability. Therefore, transdermal route was developed to overcome the problem. Skin penetration enhancers: ethanol, urea, and oleic acid, were added to the transdermal glucosamine gel formulations, and penetration ability through skin was examined by *in vitro* Franz diffusion test using rat abdomen skin of *Rattus norvegicus* as diffusion membrane. Cumulative amount of glucosamine penetrated from control, formula 1 (ethanol 5%), formula 2 (urea 5%), and formula 3 (oleic acid 5%) after 8 hours tests respectively were 679,50 ± 17,81µg/cm^2; 1005,49 ± 13,99 µg/cm^2; 234,09 ± 4,84 µg/cm^2; and 43,11 ± 0,46 µg/cm^2. Penetration rate of glucosamine respectively were 84,94 ± 2,23 µg/cm^2.hour; 125,69 ± 1,75 µg/cm^2.hour; 29,26 ± 0,61 µg/cm^2.hour; and 5,39 ± 0,06 µg/cm^2.hour. The physical stability of gels stored for eight weeks at room temperature (28° ± 2°C), high temperature (40° ± 2°C), and low temperature (4° ± 2°C) were observed for organoleptic, pH, and viscosity properties. The gels remain stable at low temperature (4° ± 2°C) storage.

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