Formulasi dan uji penetrasi in vitro sediaan gel transfersom mengandung kofein dengan efek lipolisis dalam penanganan antiselulit = Formulation and in vitro penetration evaluation of transfersome gel preparation contains caffeine with lipolysis effect in the treatment of anticellulite

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Abstrak

Transfersom merupakan teknologi nano vesikel yang bersifat deformabel, elastis dan fleksibel sehingga mampu berpenetrasi sampai ke lapisan kulit yang lebih dalam. Kofein berkhasiat sebagai antiselulit melalui stimulasi jalur lipolisis pada sel lemak. Penelitian ini bertujuan untuk mengetahui kemampuan daya penetrasi gel transfersom kofein dan efek lipolisisnya dibandingkan dengan sediaan gel kofein tanpa transfersom. Empat formula transfersom dibuat dengan konsentrasi kofein yang berbeda (1; 2; 3; 5 %) menggunakan metode hidrasi lapis tipis. Suspensi formula 4 dengan ukuran partikel 202,35 nm, indeks polidipersitas 0,1090 dan efisiensi jerapan 58,91% dipilih untuk sediaan gel. Uji penetrasi dilakukan secara in vitro dengan Sel Difusi Franz, sedangkan reaksi enzimatik lipolisis dengan metode kolorimetri. Jumlah kumulatif kofein yang terpenetrasi dari gel transfersom lebih tinggi yaitu 1218,34+358,71 g cm-2, persentase jumlah kumulatif 8,53+2,55% dan fluks 360,91+86,50 g cm-2 jam-1. Sementara gel kofein tanpa transfersom memiliki jumlah kumulatif terpenetrasi 369,29+231,57 g cm-2, persentase jumlah kumulatif 2,61+1,37% dan fluks 70,96+73,39 g cm-2 jam-1. Konsentrasi gliserol bebas hasil uji enzimatik lipolisis gel transfersom kofein lebih tinggi (4,03+1,64 nmol) dibandingkan gel kofein tanpa transfersom (0,81+0,39 nmol). Dapat disimpulkan bahwa gel transfersom kofein memhasilkan daya penetrasi dan reaksi enzimatik lipolisis yang lebih baik dibandingkan gel kofein tanpa transfersom.

.....Transfersome is a vesicle nano technology which is deformable so it can penetrate to the deeper layer of skin. Caffeine as an anticellulite can stimulate adipocyte lipolysis. The aim of this study is to investigate in vitro penetration and lipolysis effect of caffeine transfersome gel compared to nontransfersome gel. Four transfersome formulations with different caffeine concentrations (1; 2; 3; 5 %) were made using thin layer hidration method. The fourth formulation was choosen to be loaded into gel (vesicle size is 202.35 nm ; polydispersity index is 0.1090 ; entrapment efficiency is 58.91%). The in vitro penetration evaluation was determined using Franz Diffusion Cell. Glycerol concentration from lipolysis enzymatic reaction was determined using colorimetry method. The cumulative amount penetrated from caffeine transfersome gel is 1218.34+358.71 g cm-2, cumulative amount percentage is 8.53+2.55% and flux is 360.91+86.50 g cm-2 hr-1. Those results gave higher value than nontransfersome gel (cumulative amount 369.29+231.57 g cm-2 ; cumulative amount percentage 2.61+1.37% ; flux 70.96+73.39 g cm-2 hr-1). Free glycerol concentration from lipolysis enzymatic reaction of caffeine transfersome gel is higher (4.03+1.64 nmol) than nontransfersome gel (0.81+0.39 nmol). The conclusion is caffeine transfersome gel has better penetration and lipolysis enzymatic reaction than caffeine nontransfersome gel.