

Abstracts

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An animal model assessment of common dye-induced allergic contact dermatitis

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Dyes are a category of substances capable of inducing allergic contact dermatitis found in a variety of foods, drugs, textiles, cosmetics, and hair dyes. This study tested 33 dyes in guinea pigs using a modified Buehler and Klecak method for open epicutaneous testing. The dyes were tested at an induction concentration of 10.0%, 5.0%, and 2.5%. Nine of the 33 dyes tested produced positive allergic reactions in the guinea pig model (2-amino-4-nitrophenol, 2-amino-5-nitrophenol, acid yellow 23, acid orange 3, basic black 3, basic orange 1, disperse orange 3, solvent black 27, and solvent black 34). When eight of the nine positive dyes were retested using a 1% induction concentration, five dyes produced allergic contact dermatitis at a 1% challenge concentration (2-amino-4-nitrophenol, 2-amino-5-nitrophenol, acid yellow 23, disperse orange 3, and solvent black 34), two at a 0.5% challenge concentration (2-amino-5-nitrophenol and solvent black 34), and one at a 0.25% challenge concentration (2-amino-5-nitrophenol). DNCB at a 0.5% induction/challenge concentration was used as a positive control. With the exception of disperse orange 3 and acid yellow 23, the seven additional dyes that elicited positive allergic reactions in the guinea pig model have not been previously reported.

Spectrofluorimetric determination of tranexamic acid in hydrogel patch formulations by derivatization with naphthalene-2, 3-dicarboxaldehyde/cyanide

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The aim of this research was to develop and validate a spectrofluorimetric method for determination of tranexamic acid in hydrogel patch formulations. Tranexamic acid (*trans*-4-aminomethylcyclohexanecarboxylic acid, *trans*-AMCHA) is an antifibrinolytic drug that recently gained attention as a skin-whitening agent due to its inhibitory effect on ultraviolet (UV)-induced pigmentation *in vivo*. Derivatization with naphthalene-2, 3-dicarboxaldehyde (NDA) in the presence of cyanide ion (CN⁻) to produce a fluorescent 1-cyanobenz[*f*]isoindole (CBI) product ($\lambda_{\text{ex}} = 420 \text{ nm}$, $\lambda_{\text{em}} = 480 \text{ nm}$) [[Au: Please check the symbol.]] is for the first time reported for the determination of tranexamic acid in hydrogel patch formulations. Other separation techniques were not used in the analysis of the CBI-fluorescent product as required in the previous studies. The developed method was proven to be precise and accurate with percent recoveries ranging between 98.0% and 101.8% at the concentration range of 8.4–84.0 $\mu\text{g/ml}$ ($R^2 > 0.999$). The intra- and inter-day precisions as expressed by the relative standard deviations (RSD) were below 1.85%. Derivatization of tranexamic acid with NDA/CN⁻ was completed within 5 min and was stable for at least 30 min. The method has been applied to the analysis of drug content and release profiles in tranexamic hydrogel patch formulations.