Synopsis of Original Research Paper

Verification of skin safety and examination of cosmetological effects by weak electric current of iontophoresis

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Iontophoresis is a non-invasive transdermal drug delivery technology using weak electric current. Although iontophoresis is widely used in beauty field, its safety has not been investigated. Based on the previous our research, it was predicted that iontophoresis will induce some negative effects such as inflammation via activation cell signaling. In this study, we tried to study the effect of weak electric current at iontophoresis on the safety and functionality of each skin under cathode and anode. Morphological damage was not observed in the skin after iontophoresis. The amounts of mRNAs relating inflammation, tumor necrosis factor-α and interleukin (IL) -6 and anti-inflammatory cytokine IL-10 and transforming growth factor (TGF)-β. The amounts of these mRNAs were not affected by iontophoresis under normal conditions (0.34 mA/cm^2). However, iontophoresis under more intense conditions (1.0 mA / cm^2) showed an increasing trend of IL-6 and IL-10 mRNA. The skin functional components collagen and ceramide were increased by iontophoresis under normal conditions. From these results, it was suggested that iontophoresis under normal conditions does not induce any inflammation in the skin tissue. In conclusion, iontophoresis is a safety and useful technology for transdermal drug delivery and skin beauty.