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QUALITATIVE AND QUANTITATIVE ANALYSIS OF TRANSDERMIC DELIVERY OF DIFFERENT BIOLOGICAL MOLECULES BY IONTOPHORESIS

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"Transderm" is a particular device delivering bursts of positive and negative current pulses and able to enhance the transdermal delivery of numerous biological molecules. In this study we evaluated the enhancement of transdermal delivery of collagen type I and of lidocaine induced by "Transderm". Rats were anaesthetized, different skin areas were treated by appropriate solutions of radioactive lidocaine and of collagen-fluorescein, then electric treatment was performed. Thick biopsies were taken at the end of the electric treatment both from each treated area and from control areas. For the histologic evaluation, specimens were stained by an Haematoxylin-Eosin solution and observed by light microscope; qualitative analysis of the transdermal delivery of collagen-fluorescein was performed by confocal fluorescence microscope; measure of transdermal transport of radioactive lidocaine was performed by liquid scintillation. After electric treatment, epidermis and dermis do not show any significant modifications in comparison to untreated specimens. Staining, distribution and shape both of connective cells and of collagen bundles and adnexa are completely overlapping to that of controls. In treated specimens numerous molecules of collagen-fluorescein are distributed into the dermis from the surface to the depth while no significant fluorescence can be observed in control specimens. Transdermal delivery of lidocaine shows a significant increase of about four times more in treated areas in comparison to control areas. In conclusion "Transderm" enhances the transdermic delivery of collagen type I and of lidocaine with no significant alterations of the histologic structure of the tissue; this makes "Transderm" an optimal device for dermatological treatments.