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101

EVALUATION OF VASCULAR EFFECTS AFTER PHOTODYNAMIC AND PHOTOTHERMAL INTERVENTION ON A RODENT DORSAL SKINFOLD

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Background and Objective: The vascular effects of photodynamic (PDT) and pulsed dye laser therapy (PDL) were investigated and compared alone or in combination to evaluate potential therapeutic options for treatment of cutaneous vascular lesions.

Study Design/Materials and Methods: A dorsal skinfold was lifted on rodents, exposing the underlying dermis and allowing intervention from the epidermal or subdermal side and vascular imaging from the subdermal side. One mg/kg of benzoporphyrin derivate monoacid ring A (BPD; Verteporfin, QLT, Vancouver, Canada) solution was administered intravenously via a jugular vein catheter. Study groups were as follows: control (no BPD, no light), PDL (585 nm, τ_p 1.5 ms, 10 J/cm^2), BPD + CW irradiation (PDT), and BPD + CW irradiation followed immediately by PDL (PDT + PDL). Blood vessels were assessed for vascular damage with laser speckle imaging (LSI) before, immediately after, and 18 hours post intervention.

Results: No epidermal disruption was noted in any of the intervention groups. PDT and PDT + PDL resulted in a selective vascular effect which was significantly greater than that observed with PDL alone.

Conclusion: PDT alone or in combination with photothermal intervention can achieve selective vascular injury which may be useful for treatment of hypervascular skin lesions including port wine stain birthmarks.