

UC Irvine

UC Irvine Previously Published Works

Title

PRECLINICAL IN VIVO EVALUATION OF VASCULAR EFFECTS OF PULSED DYE LASER IN COMBINATION WITH OXYMETAZOLINE

Permalink

<https://escholarship.org/uc/item/8mf8w2wq>

Authors

Pai, Alex
Kelly, Alexis
Lertsakdadet, Ben
[et al.](#)

Publication Date

2019

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

**PRECLINICAL *IN VIVO* EVALUATION OF
VASCULAR EFFECTS OF PULSED DYE LASER IN
COMBINATION WITH OXYMETAZOLINE**

**Alex Pai, Alexis Kelly, Ben Lertsakdadet, Bernard
Choi, Kristen M. Kelly**

University of California – Irvine, Irvine, CA

Background: Oxymetazoline is a medication with vascular effect approved for topical treatment of persistent facial erythema associated with rosacea. Due to the dynamic effect of this agent on the vasculature, oxymetazoline may be a useful adjunct for pulsed dye laser (PDL) treatments.

Study Design/Materials and Method: A dorsal window chamber was surgically installed on 18 mice. Each animal was applied to one of the following experimental groups: saline alone (negative control), oxymetazoline alone (10 μ L applied on daily basis), PDL alone [saline applied five minutes before PDL irradiation (10 mm spot size, 1.5 ms pulse duration, 7 J/cm² delivered to epidermal side of the window), or oxymetazoline + PDL (10 μ L oxymetazoline applied five minutes before PDL and then on daily basis). To monitor vascular architectural and functional changes, brightfield and laser speckle imaging were performed for seven days.

Results: With application of oxymetazoline, inconsistent changes were observed in vessel diameter. PDL alone at study settings resulted in an initial decrease but subsequent recurrence of flow at seven days post-irradiation. With oxymetazoline + PDL, a noticeable difference in vascular effects were observed at seven days: an increase in probability of vascular shutdown and a difference in vascular architecture (an increase in tortuous microvasculature that is suggestive of replacement of native larger vessels with smaller vessels *via* angiogenesis).

Conclusion: Oxymetazoline + PDL may enhance cutaneous vascular shutdown and should be explored as a combined treatment option for cutaneous vascular conditions including rosacea and port wine birthmarks.