

## Applications of Oxymetazoline in Dermatology

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### EDITORIAL

Oxymetazoline is a synthetic direct-acting, postsynaptic, sympathomimetic, time-limited, imidazoline receptor agonist [1-3]. It works primarily on  $\alpha$ -1A receptors and, to a lesser extent,  $\alpha$ -2B receptors which are involved in the contraction of arterioles. Contraction of venules upon application of oxymetazoline is mediated by its action on  $\alpha$ -1B and  $\alpha$ -2D receptors [4]. It has long been used in ophthalmologic and nasal formulations. This letter will shed light on the uses of oxymetazoline in dermatology. Rosacea is a popular chronic inflammatory cutaneous disease with a predilection for individuals with Fitzpatrick skin types I and II [1]. It has a significant impact on individual psychosocial status and quality of life [4]. Facial erythema, flushing and telangiectasia are features of erythematotelangiectatic rosacea. Facial erythema is a mandatory criterion for the diagnosis of rosacea. Decreasing rosacea-associated facial erythema has been linked to improvement of quality of life. Oxymetazoline is an  $\alpha$ -1A adrenergic receptor agonist causing vasoconstriction and thereby reducing facial erythema. Oxymetazoline 1% cream is a United States FDA-approved for rosacea-related erythema. In a 52-week trial conducted on 440 patients, less than 1% of patients experienced rebound erythema following cessation of oxymetazoline [2]. Pulsed-dye laser targets hemoglobin and is an effective treatment for erythema and telangiectasia. Oxymetazoline 1% cream can be combined with pulsed-dye laser for the treatment of erythematotelangiectatic rosacea [5]. Combination of oxymetazoline and PDL in an animal model study resulted in persistent vascular shutdown 7 days following the laser treatment [4]. Combining pulsed-dye laser with daily oxymetazoline 1% cream can be an effective treatment for erythema and telangiectasia associated with rosacea and should be considered for moderate-

to-severe cases. A few patients reported irritation with oxymetazoline 1% cream but did not result in treatment cessation [5].

Post-acne erythema is a common complication of acne which may improve with time; however, it may persist following completion of acne treatment eventuating in disappointment and psychological distress [3]. Oxymetazoline has anti-inflammatory actions such as decreasing the secretion of IL-6 and IL-8 [6]. It also inhibits neutrophilic phagocytosis and oxidative stress which result in decreased release of pro-inflammatory cytokines and decreased inflammation [3]. Further, it has a significant effect on the arachidonic acid cascade, avidly blocking 5-lipoxygenase activity and thus decreasing the synthesis of the pro-inflammatory leukotriene B4 [3]. In a controlled comparative split-face trial conducted on 40 patients, oxymetazoline 1.5% in liposomal base was shown to be an effective modality for post-acne erythema treatment [3].

Botulinum toxin is used in cosmetic injections producing its effect by temporarily paralyzing muscles. Incidence of botulinum toxin-induced blepharoptosis is less than 1% among experienced injectors. Oxymetazoline is the only current FDA-approved medication for the treatment of acquired blepharoptosis in adults. It works through stimulation of the superior tarsal muscle by activation of its  $\alpha$ -1 and  $\alpha$ -2 receptors resulting in elevation of the eyelid. It resulted in a remarkable improvement of the superior visual field among the patients treated for their acquired blepharoptosis. Once daily application of oxymetazoline 0.1% hydrochloride is an efficacious, safe, quick, and non-invasive modality of treatment for blepharoptosis due to botulinum toxin [7].

Oxymetazoline may be used as a hemostatic agent for large surgical defects during dermatologic surgeries. Oxymetazoline hydrochloride 0.05% soaked gauze is considered a cost-effective modality minimizing bleeding intraoperatively and post-operatively as well [8].

Oxymetazoline is acclaimed for its safety profile; however, it may pose potential risk to patients with comorbid cardiovascular diseases, such as hypertension or heart disease. Additionally, patients with narrow angle glaucoma may be at an increased risk for angle

closure glaucoma. Furthermore, patients with vascular insufficiency such as Raynaud's or scleroderma are at a possible risk of developing more severe exacerbations of their symptoms [2].

In conclusion, oxymetazoline is a promising medication that can be utilized in several dermatological diseases. It is praised for its minimal side effects and decreased incidence of rebound erythema. It has been widely studied and prescribed for rosacea; however, more clinical trials are needed to prove its therapeutic effects and investigate for adverse events in the different dermatologic applications. Oxymetazoline may be foreseeably tested in the treatment of several conditions including but not limited to cutaneous dermatomyositis, keloids, pyogenic granuloma, and Kaposi sarcoma.

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