# Latanoprost for the Treatment of Alopecia Areata of Eyelashes

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## Abstract

**Background**: Latanoprost, a prostaglandin F 2a analogue, is an intraocular pressure lowering drug used in the treatment of glaucoma. Increase in eyelash number, length, pigmentation, curvature is reported after using topical Latanoprost in these patients. The aim of this study was to evaluate the effect of Latanoprost ophthalmic solution on eyelash regrowth in patients with alopecia areata.

**Methods**: Fifteen patients with alopecia areata and bilateral eyelash involvement, who showed excellent response to diphencyprone therapy, entered the study to be treated with Latanoprost ophthalmic solution. In each patient, one eye was randomly treated with Latanoprost daily over 3 months. To assess the eyelash changes, patients were followed up monthly.

**Results**: Ten patients completed the study. Two patients had significant eyelash regrowth of both eyes. One patient showed eyelash regrowth on upper eyelid of the eye treated with Latanoprost.

**Conclusion**: In this study, Latanoprost was not effective in treatment of alopecia areata of eyelashes. It is advisable to evaluate the efficacy of higher concentration and/or more frequent application of the Latanoprost with an appropriate vehicle for the treatment of alopecia areata of eyelashes.

**Keywords**: alopecia areata, Latanoprost, diphencyprone

## Introduction

Alopecia areata accounts for about 2% of new dermatology outpatient visits in the United Kingdom and the United States[1]. It is a non-scarring inflammatory hair loss condition which is characterized by sudden appearance of well-demarcated round or oval patches of hair loss. It may be limited to few patches disappearing in less than 6 months or developing into complete absence of scalp hair (alopecia totalis ) or scalp and body hair (alopecia universalis ).The scalp is the most common site affected by alopecia areata, although eyebrows and eyelashes may be affected. Alopecia areata seems to be a tissue specific autoimmune disease with lymphatic infiltration around and within the hair follicles[2,3].

Different types of medications such as topical and systemic steroids[4,5] , cyclosporine[6], methoxsalen with UVA irradiation[7], anthralin[8], minoxidil[9] and topical immunotherapy[10-13] with dinitrochlorobenzene, squaric acid dibutylester,and diphencyprone have been tried for the treatment of alopecia areata.

Topical Latanoprost is an intraocular pressure lowering medication used in the treatment of

glaucoma. Changes in number, length, thickness, curvature, and pigmentation of eyelashes has been reported as its side effects[14,15].

It is possible that patients with alopecia areata of eyelash may benefit from being treated with this prostaglandin F 2a analogue. This study was conducted on patients with extensive alopecia areata and bilateral eyelash involvement to assess the clinical effect of Latanoprost on eyelash hair regrowth.

## Patients and Methods

In this randomized within-patient pilot study, patients with alopecia areata who had more than 50% scalp involvement for more than 1 year and did not show hair regrowth during the past 6 months were included. Patients had not received any topical or systemic treatment for 3 months prior to study. All of the patients with severe systemic disorders, cardiovascular diseases, and autoimmune diseases, pregnant and lactating women were excluded from the study.

Routine laboratory tests including complete blood count (CBC), blood urine nitrogen, creatinine, sodium, potassium, urine analysis, free thyroxin, and thyroid stimulating hormone (TSH) were done and eye examination was preformed in all of the patients.

In each patient, half of the scalp was randomly sensitized with 2% diphencyprone. During each weekly subsequent visit, patients were treated with gradually increased concentrations adjusted in order to maintain erythema, itching, or mild contact dermatitis on the patient's scalp for 48 hours. When hair growth was observed in this side, the other half of scalp received treatment. No evidence of terminal or vellus hair regrowth of scalp led to the exclusion of the patients from the study.

Patients who showed the evidence of hair regrowth on the whole scalp after treatment with diphencyprone were selected to be treated with Latanoprost. Patients were randomly assigned to treat one eye with ophthalmic Latanoprost solution (Xalatan, Pfizer Inc. Morris Plains, NJ) 0.005% and the other eye with daily placebo for over 3 months.

Patients were monthly visited by a dermatologist and an ophthalmologist who were not aware of the type of treatment. Digital photography was done in each session and eyelash hairs were counted.

## Results

Of the 15 enrolled patients, 10 (7 females and 3 males) completed the 3-month study. Two patients discontinued the treatment because of dissatisfaction and three withdrew from the study due to severe contact dermatitis occurred on eyelids of the side treated with Latanoprost.

Among 10 patients who completed the study, 6 patients showed no eyelash regrowth. In two patients, significant response on both eyelids was observed. One patient had response in the eyelids treated with placebo. One patient responded only on upper lid of eye treated with Latanoprost (table 1).

No adverse effect was observed except for mild pruritus in one patient and feeling of warmth on eyelids in another patient. Intraocular pressure did not change during the study.

## Discussion

Development of hypertrichosis and increase in thickness, length, curvature and number of eyelashes after treatment with topical Latanoprost has been reported in patients with glaucoma[14-18]. In a controlled study among 43 patients using Latanoprost unilaterally, Johnstone found ipsilateral hypertrichosis in terminal eyelashes and regional intermediate hairs of the upper and lower eyelid as well as vellus hair of the lower eyelid[14]. Additional case reports noted favorable changes in eyelash characteristics of patients with alopecia[19,20].

In this study, no eyelash regrowth was observed 3 months after treatment with Latanoprost in

***Table 1.*** *Demographics of patients and their response to treatment with Latanoprost*

| No. | Age (year) | Sex | Duration Of Disease ( year ) | Treated Eye | Number of eyelashes upper/1ower (before tx) | | Number of eyelashes upper/1ower (1 month) | | Number of eyelashes upper/1ower (2 months) | | Number of eyelashes upper/1ower (3 months) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R | L | R | L | R | L | R | L |
| 1 | 20 | F | 9 | Right | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 2 | 23 | M | 13 | Right | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 3 | 25 | M | 15 | Right | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 4 | 24 | M | 10 | Left | 15/15 | 15/15 | 15/15 | 15/15 | 15/30 | 30/50 | 60/50 | 60/50 |
| 5 | 18 | F | 10 | Right | 0/0 | 0/0 | 4/0 | 0/0 | 4/0 | 0/0 | 4/0 | 2/0 |
| 6 | 18 | F | 9 | Right | 2/4 | 3/5 | 2/4 | 15/20 | 3/5 | 30/40 | 10/10 | 40/40 |
| 7 | 35 | F | 20 | Left | 7/2 | 3/2 | 15/13 | 20/15 | 15/13 | 20/15 | 35/30 | 35/26 |
| 8 | 21 | F | 11 | Left | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 9 | 18 | F | 3 | Right | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| 10 | 21 | F | 10 | Left | 0/0 | 0/0 | 0/0 | 0/0 | 3/2 | 10/3 | 10/10 | 40/10 |

patients with alopecia areata and eyelash involvement. Ross et al observed no positive outcome in treatment with Latanoprost in patients with alopecia areata of eyebrow as well[21].

The application of higher concentrations of Latanoprost might increase its efficacy. In fact, an experimental study on a model of androgenetic alopecia showed minimal hair growth with 50 mcg/ml Latanoprost over 5 months; whereas, moderate to marked hair growth was observed 3 months after application of 500 mcg/ml latanoprost[22]. Alternatively, increased frequency of drug application could be considered to have more desirable results.

Chiba et al reported eyelash changes in patients with glaucoma who were treated with Latanoprost for a long period of 12 months. The incidence of eyelash change increased by time: it was 0% at 1 month, 33.8% at 3 months, 44.4% at 6 months and 46.2% at 12 months[15]. Anyhow, in this study even a minimal positive result was not obtained after 3 months.

Concerning the cutaneous absorption of latanoprost[22], inappropriate vehicle and subsequent partial penetration of drug into skin may be another reason for negative results of this study.

Further studies with larger sample size, higher concentrations and more frequent application of the drug and an appropriate vehicle are needed to reveal the therapeutic role of Latanoprost in patients with alopecia areata of eyelashes.

In addition, it may be worth assessing the effect of recent synthetic prostaglandin/prostamide analogues such as travoprost or bimatoprost in future studies.

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