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Triamcinolone delays retinal atrophy in a mouse laser-induced geographic atrophy model

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Purpose

Limited treatment options for patients with geographic atrophy (GA) pose challenges to find proper positive controls in preclinical models. This study aimed to test the efficacy of subconjunctival administration of triamcinolone in a laser-induced mouse model of GA[1].

Methods

Animals: Male (M) & female (F) C57BL/6JRj mice, (11 – 12 weeks).

Treatment groups: Triamcinolone group (5M, 5F) and PBS control group (4M, 4F).

Induction of GA: The lesion was induced with infrared laser (810 nm, 50 mW). Nine shots were delivered to the temporal side of optic nerve, OD, (spot size: 300um and duration: 1000 ms).

Treatment: Triamcinolone (40 µg/eye, 1 µl) or PBS (4 µl/eye) subconjunctivally at Day -1, Day 13 and Day 28 post-induction.

Retinal pathology assessment: Spectral-domain optical coherence tomography (SD-OCT) & Fundus autofluoresence (FAF) – weekly until Day 56

Histopathological assessment: F-actin labelling with Phalloidin

Results

1. Triamcinolone-treated group displayed discrete laser shots as compared to PBS group

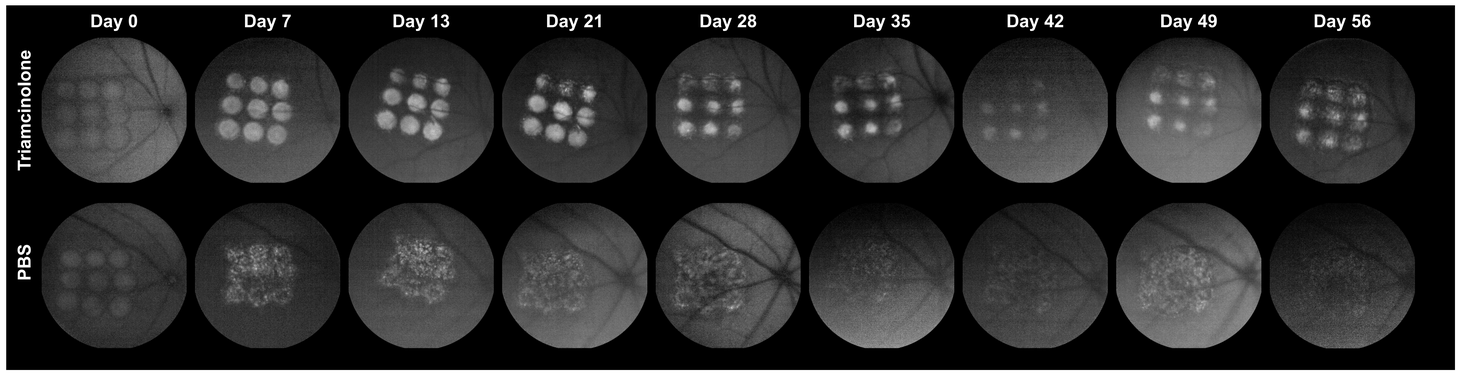

Figure 1. FAF images demonstrating laser shots in the triamcinolone and PBS groups. Note discrete laser shots in the triamcinolone group at all timepoints.

2. Triamcinolone treatment preserved retinal thickness and delayed progression of the lesion

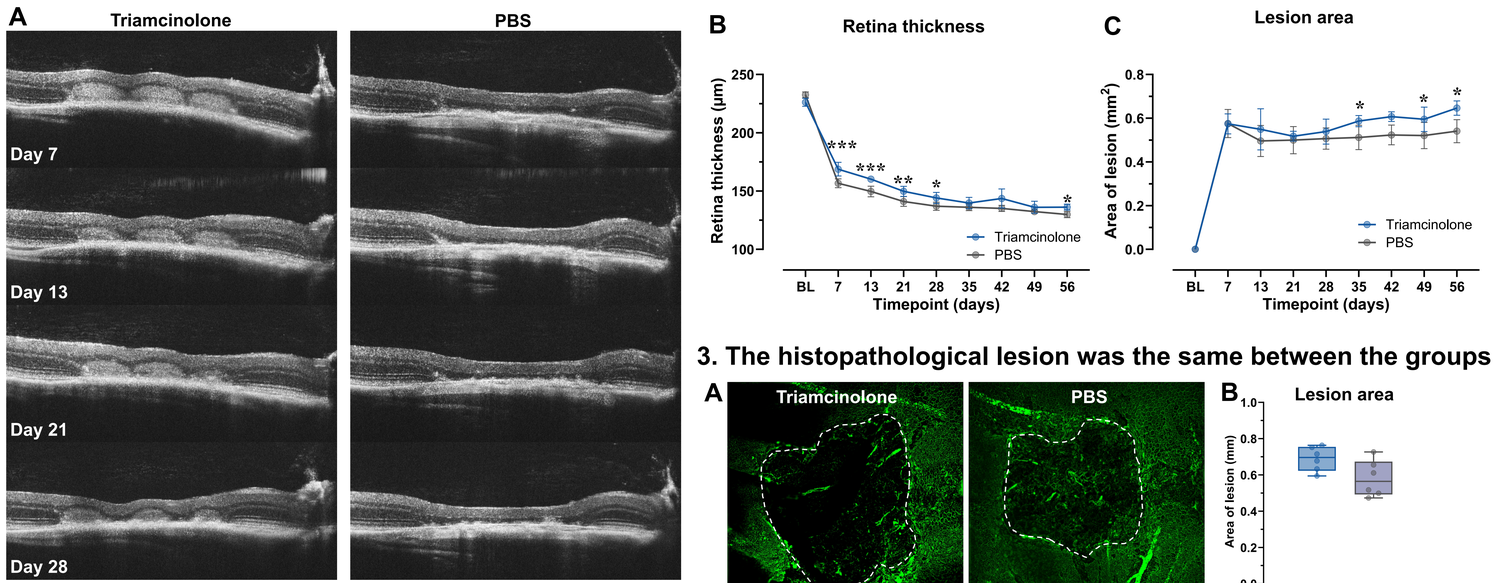

Figure 2. SD-OCT images and line plots demonstrating retinal thickness and lesion area in the different treatment groups. (**A**) SD-OCT images show decreased retinal thickness in the PBS group. (**B**) The retinal thicknes was bigger in the triamcinolone group at several timepoints post-lesion induction. (**C**) The lesion area was bigger in the triamcinolone group at late timepoints.

3. The histopathological lesion was the same between the groups

Figure 3. Photomicrograhs of phalloidin-labelled F-actin and box plot demonstrating lesion area. **(A)** the lesion area is demonstrated in white dashed line. **(B)** There was no statistically significant difference in the lesion area between the groups.

Conclusion

Subconjunctival administration of triamcinolone delays retinal atrophy in the laser-induced mouse model of GA. Female mice experienced weight loss during treatment. Our data suggests traimcinolone can serve as a positive control for preclinical GA model. However, further testing is needed to determine ideal test paradigm for optimal outcome in both sex.

Disclosures
EX, LB, TR, KA, TA, TL, NH, VO, AH, KA, PP, LE, VS, BS, VM: none
GK: Experimentica Ltd. (I,S)

References
[1]Ibbett P *et al.* Sci Rep. 2019;9,7475

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