

Meibomian Gland Structure and Atrophy in Contact Lens Wearers and Non-Wearers

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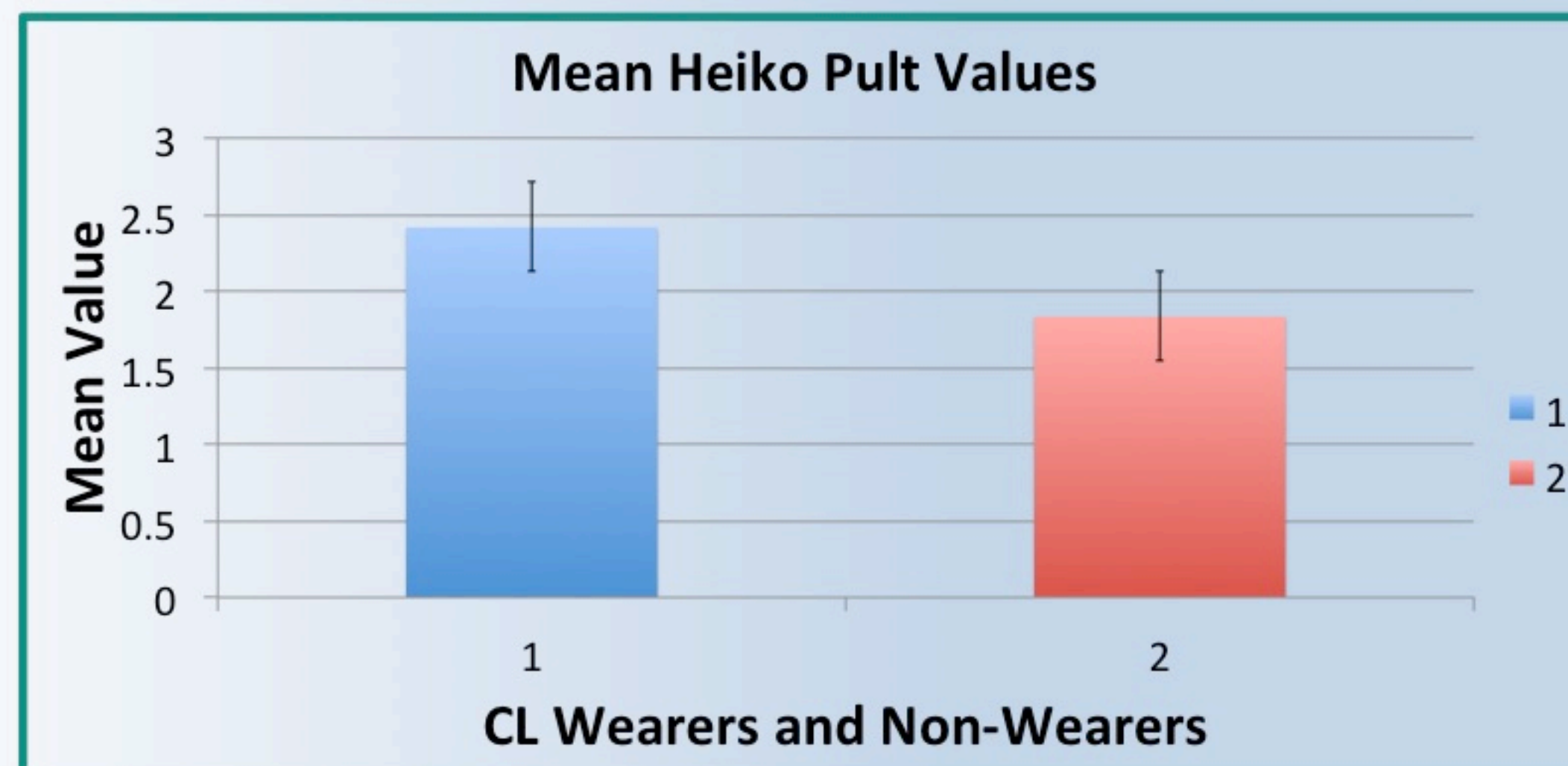
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Abstract

Dry eye symptoms are a major complications of soft contact lens (SCL) wear, and meibomian gland dysfunction (MGD) is a major contributor. Our purpose was to compare the ocular health and meibomian gland structure of soft contact lens wearers to those of non-contact lens wearers. Our research indicates that while SCL wearers did, on average, have more MGD and meibomian gland loss than did non-SCL wearers, the difference between the two groups is not statistically significant.



Group 1: SCL wearers
Group 2: non-SCL wearers

Introduction

Previous studies indicated that 30-50% of SCL wearers complain of dry eye symptoms, and SCL wearers have a higher incidence of MGD compared to non-SCL wearers.¹ Lipid interferometry showed a significantly thinner meibum layer of the tear film in subjects with MGD compared to controls.² However, the relationships between long-term contact lens wear and meibomian gland atrophy has not been elucidated. Possible mechanisms for meibomian gland morphological changes include mechanical interactions with the eyelid, alteration of the natural blink, accumulation of desquamated epithelial cells at the meibomian gland orifices, or an undiscovered mechanism.^{1, 3, 4}

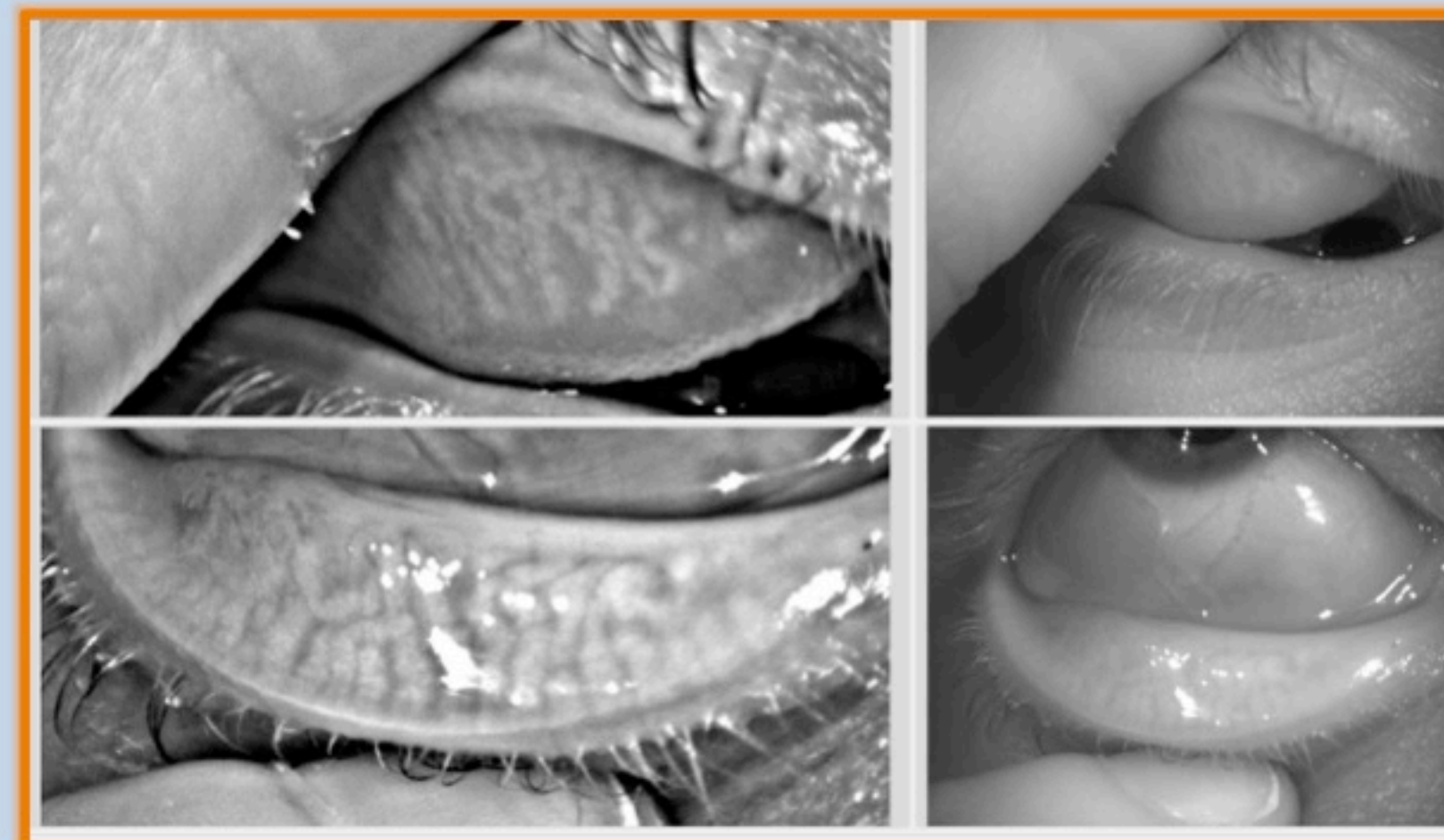
Methods

Subjects were divided into two groups.

Group 1: SCL wearer (5+ continuous years; n=24)

Group 2: Non-SCL wearers (control group; n=24)

Subjects were between the ages of 18-35, and self-reported good compliance with appropriate contact lens care and replacement. Subjects in both groups reported dry eye symptoms ranging from none to moderate. The groups were scored on tear break-up time (TBUT) with <10 seconds TBUT indicating dry eye; superficial punctate keratitis (SPK) compared to the Oxford Grading Schema for dry eye; and signs of ocular irritation (injection) via slit lamp exam. Meibomian glands were imaged using the Oculus® Keratograph meibographer and graded by the Heiko Pult scale.



Oculus® Keratograph meibography of non-SCL wearer

Results

Results were determined by way of a two tailed Mann-Whitney U test comparing the grade of meibomian gland atrophy between the two groups, as measured by the Heiko Pult scale. The resultant U test determined, with a p-value of 0.1188, that there was no statistical significance between the mean meibomian gland atrophy of non-wearers and that of soft contact lens wearers. There was also no significant difference in SPK, TBUT, or conjunctival injection between the two groups.



Meibomian gland loss in a long-term SCL wearer

Conclusion

The results of our study suggest that while the mean Heiko Pult score for SCL wearers was higher (indicating more MGD) than that of non-wearers, the difference was not statistically significant. While this was a small sample set, these results suggest skepticism of the predominant hypothesis that SCLs significantly contribute to the advancement of meibomian gland atrophy. Further research into the origins of SCL discomfort, a leading cause of discontinuation of SCL wear, is needed.

References

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