



PARADOXICAL EFFECT OF ARTIFICIAL TEAR DROP USE ON SIGNS AND SYMPTOMS OF DRY-EYE DISEASE

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The authors have no financial disclosure related to this project.

This study was supported in part by grant K24 EY019098 from the National Institutes of Health.



INTRODUCTION

- Dry eye disease (DED) is a common pathology of the ocular surface and tear film.
- An estimated 9 million people are affected by DED in the United States alone.
- DED presents with deficient tear production, unstable tear film (rapid evaporation) or both.
- Pathophysiology is not fully understood. However, tear hyperosmolarity, ocular surface inflammation and corneal epithelial damage are commonly present.
- Symptoms include burning, irritation, foreign body sensation, grittiness, eye fatigue, and redness, among others.
- Persistence of symptoms in combination with fluctuating visual function can significantly diminish patients' quality of life and social functioning.
- DED patients are more likely to suffer from symptoms of depression and anxiety compared to the normal population.



OBJECTIVES

- Primary:
 - To evaluate the effect of artificial tears on signs and symptoms of DED.
- Secondary:
 - To evaluate the effect of artificial tears in patients with mild/moderate vs. severe DED.



PATIENTS AND METHODS

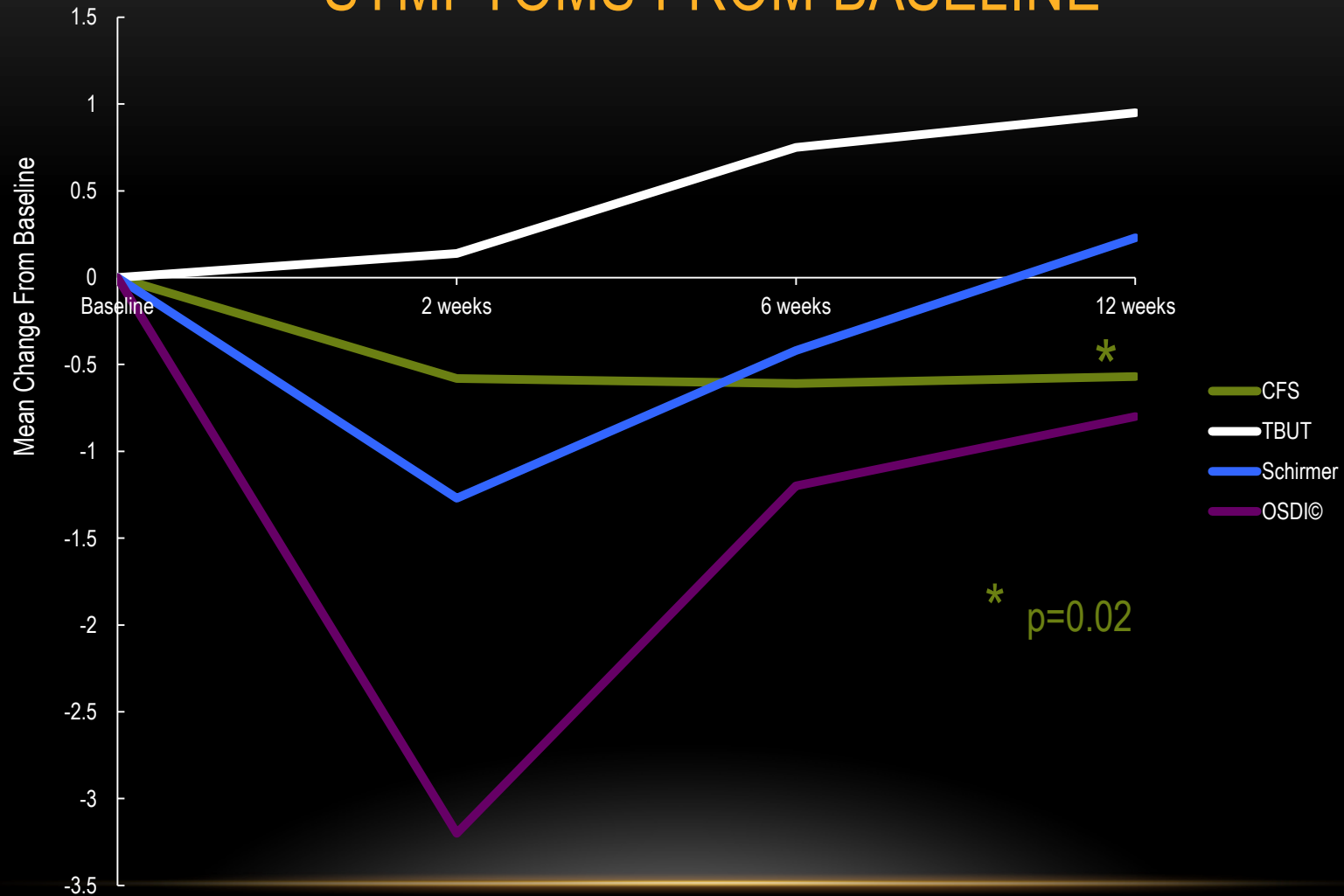
- Prospective study.
- A total of 30 patients 18 years or older suffering from symptoms of DED and positive corneal fluorescein staining (CFS) were included.
- Subjects were started on carboxymethyl cellulose artificial tear drops three times a day in addition to their current DED treatment regimen (including warm compresses, eyelid scrubs and other artificial tear drops).
- All ocular immunomodulatory medications, including topical corticosteroids and cyclosporine, were stopped two weeks prior to starting the study.
- Patients were followed for 12 weeks with evaluations at baseline and weeks 2, 6 and 12.
- Evaluations included:
 - Symptoms: the Ocular Surface Disease Index (OSDI®) questionnaire
 - Signs: CFS (modified Oxford Grading Scale, score range: 0-5), tear break up time (TBUT) and Schirmer test
- For subgroup analysis, DED severity was categorized into mild/moderate and severe disease according to CFS (19 patients with $CFS \leq 2$ [Mild/moderate] and 11 patients with $CFS > 2$ [severe])



RESULTS

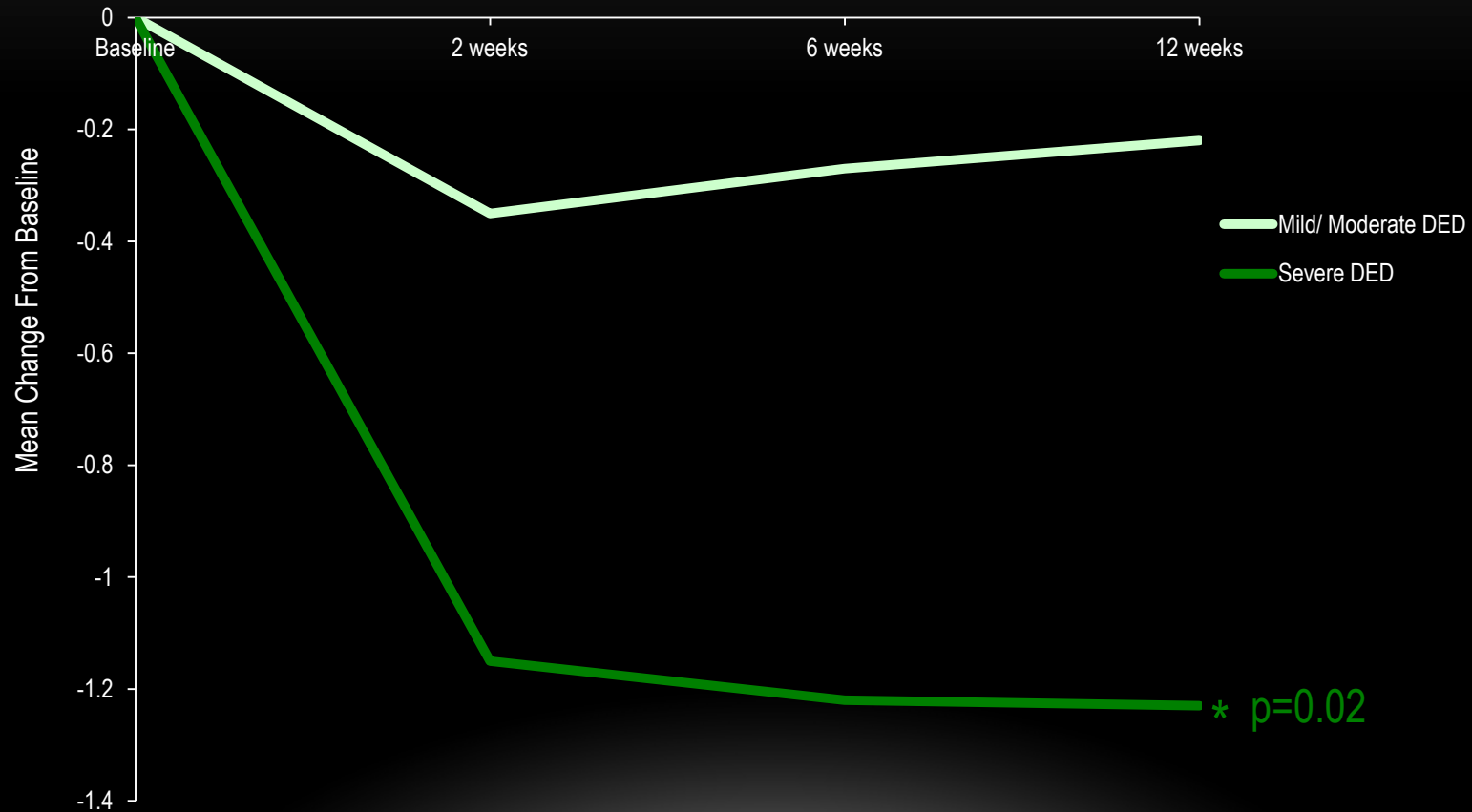


MEAN CHANGE IN SIGNS/ SYMPTOMS FROM BASELINE





MEAN CHANGE IN CFS FROM BASELINE: MILD/MODERATE VS. SEVERE DED





MEAN CHANGE IN OSDI[®] SCORE FROM BASELINE: MILD/MODERATE VS. SEVERE DED





SUMMARY

- CFS improved significantly over the course of treatment ($p=0.02$).
- After subgroup analysis (mild/moderate vs. severe DED), improvement in CFS maintained statistical significance only in patients with severe DED ($p=0.02$ in severe vs. $p=0.39$ in mild/moderate DED).
- OSDI[®] scores did not change significantly ($p=0.1$) in DED patients.
- OSDI[®] scores revealed an increasing trend in patients with severe DED ($p=0.09$), suggesting exacerbation in patient discomfort.
- There was no significant improvement in Schirmer scores ($p=0.91$) or TBUT ($p=0.2$).



CONCLUSION

- Artificial tear drop use significantly improves corneal epitheliopathy (as measured by CFS) in patients with DED, particularly in those with severe disease.
- Interestingly, a modest improvement of staining in severe DED is associated with a “paradoxical” worsening of symptoms, which we speculate could be secondary to corneal nerve regeneration.



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