A NEW METHOD OF MEASURING TEAR FILM CLEARANCE USING MEDMONT MERIDIA TOPOGRAPHER AND ITS UTILITY IN DRY EYE DISEASE DIAGNOSIS

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This study evaluates a new, accessible protocol for measuring Tear Film Clearance (TCR) using the Medmont Meridia Topographer. Current Dry Eye Disease (DED) diagnostics often lack repeatability. We measured fluorescence intensity decay over 3 minutes after fluorescein instillation in healthy and DED subjects. TCR was calculated as the percentage decrease in intensity. Results showed a linear fluorescence decay with a significantly lower slope in DED patients compared to controls ($p<0.05$). The Medmont Meridia successfully differentiated DED from healthy eyes, offering a practical tool for standardized tear film assessment in routine optometric practice.

Keywords: Dry Eye Disease (DED), Tear Turnover Rate (TTR), Tear clearance rate (TCR), Tear Break-Up Time (TBUT)

INTRODUCTION

Dry eye disease (DED) represents a significant clinical challenge globally, while currently available diagnostic methods often demonstrate limited repeatability, particularly in the early stages of the conditio [1-3]. Tear clearance rate (TCR) is dependent on hydrodynamic processes within the tear film and may serve as a single, multifactorial marker of ocular surface disorders, however usually requires sophisticated equipment to perform measurements. The aim of this study was to develop a clinically accessible and repeatable protocol for measuring TCR using Medmont Meridia Topographer.

METHODS

33 subjects age 26 ± 9 (mean ± SD) years old were tested. Fluorescein was instilled into the conjunctival sac using a fluorescein strip, followed by continuous recording of fluorescence intensity over a 3-minute period with Medmont Meridia Topographer. TCR was calculated as a percentage decrease in fluorescence intensity over time. Measurements obtained from healthy subjects were compared with those from subjects diagnosed with DED based on Dry Eye Workshop II criteria.

RESULTS

The fluorescence intensity curve had linear characteristics, with a lower slope in the DED group. TCR was significantly different in DED subjects compared to healthy controls.

CONCLUSIONS

Our study demonstrates that it is possible to assess TCR using Medmont Meridia and TCR can discriminate between DED subjects and healthy controls ($p<0.05$).

The developed measurement protocol may serve as a practical tool to support DED diagnosis in routine optometric practice and may contribute to the standardization of tear film stability assessment.

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