


Evaluation of Tear Film Osmolarity Among Diabetic Patients Using a TearLab Osmometer: A Facemask/COVID-19-Induced Comment [Letter]

Reza Rastmanesh ^{1,2}

¹The Nutrition Society, London, UK;

²The American Physical Society, College Park, MD, USA

Dear editor

I read with interest the article by Abusharha et al.¹ I would like to suggest adding two critical comments to their core conclusion. Since the authors observed that tear osmolarity is not significantly different in their small sample of enrolled diabetic participants, they suggest that “the finding may be explained by a lack of relationship between tear film parameters and diabetic severity; tear film parameters may correlate more with diabetic duration rather than severity”. While their interpretations can be partly true, those discussions are subject to two major biases.

Firstly, they have not provided a table to describe characteristics of participants, and the date when the study was carried out is not given in the paper. However, calculatedly, the mean age of diabetic patients in their study is significantly higher than that of their control group ($P < 0.001$), which questions any comparison.

Secondly, if assumedly their study was carried out during the COVID-19 pandemic, then a game-changing bias has not been accounted for in their study design. Mandatory facemask wearing during COVID-19 negatively—directly or indirectly—affects the ocular surface and dry eye, and results in dry eye creation or worsening preexisting eye dryness.² Both basal tear production³ and reflex tearing⁴ are tightly associated with tear osmolarity in a bilateral fashion. Since drastic between-individual differences exist in terms of facemask wearing,⁵ the severity and/or degree of facemask-induced eye dryness would be expected to be different in their nonrandom enrolled participants.

With these in mind, it is possible that lack of relationship between tear film parameters and diabetic severity, and pronounced association with diabetic duration would be most likely due to the (i) significantly higher mean age of diabetic patients than controls, not necessarily diabetes duration per se, and (ii) unmeasured/nonadjusted tear secretion in their study design. These imply that their conclusion could be either an artifact, or a genuine observation; or, association in some patients might be more pronounced, while in some patients, associations might be attenuated.

These comments apply not only to the paper by Abusharha et al.¹ but more generally to “all” studies investigating dry eye in diabetic patients since the appearance of COVID-19. A full citation of all the publications is beyond the scope of this letter, due to the space limits, but can be made available by the author on request.

Correspondence: Reza Rastmanesh
#6, Physicians Building, Sarshar Alley, Vali
Asr Street, Tajrish, Tehran, 1961835555,
Iran
Email r.rastmanesh@gmail.com

- I take this opportunity to introduce, for the first time, a hidden bias entitled “Facemask/COVID-19-Induced Bias” in ocular investigations dealing with dry eye and related diseases/parameters (such as lipid eye thinness).
- To control for such a confounding effect, I further suggest that there is an urgent need to develop and validate a specific questionnaire to quantify facemask-induced eye dryness (per type/duration/per steadiness, etc) to be used in real world settings.

I hope that this comment will trigger an enthusiasm for development of novel tools to measure eye dryness quantitatively in real world settings during the COVID-19 pandemic.

Disclosure

The author reports no potential conflicts of interest in this communication.

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