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Comparison of the tear osmolarity test vs. Other common diagnostic tests for dry eye disease in diabetic patients

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Abstract

Aims and objectives:

The purpose of the present work was to determine the diagnostic performance of tear osmolarity test; used to diagnose dry eye disease (DED) in type 2 diabetic participants using tear lab osmolarity system as the reference standard and to compare it with the other diagnostic tests (index tests) already in use, specifically Ocular Surface Disease Index (OSDI) questionnaire, Schirmer I test, TFBUT, Rose Bengal and fluorescein staining.

Materials and methods:

In this study 267 people with type 2 diabetes were recrutiated. Tear osmolarity as gold standard by 308 mOsm/L cutoff was used to diagnose dry eye disease. The other diagnostic tests were also performed: Ocular Surface Disease Index (OSDI) questionnaire, Tear Film Break up Time (TFBUT), Schirmer I test, Rose Bengal and Fluorescein staining. The results of these index tests were compared to the gold standard measurement.

Results:

Dry eye disease prevalence by the tear osmolarity test was 27.9% with female prodominancy. This prevalence via the other common diagnostic tests were: **OSDI** (17.5%), Schirmer I test (32.5%), TFBUT (41.6%), Rose Bengal (10.8%), and Fluorescein staining (4.3%). TFBUT had the highest detection rate to diagnose DED. No significant correlation was detected between tear osmolarity and other diagnostic tests. By Fluorescein staining had the highest specificity (96.8%). With the cutoff score >12, the positive likelihood ratio for the OSDI questionnaire was the highest (1.78). The sensitivity was poor for all common diagnostic tests. ROC curve analysis could not determine optimal cut offs for the common diagnostic tests.

Conclusion:

By comparison of the gold standard; other diagnostic tests underestimate the presence of dry eye disease in diabetic participants. Moreover, they could not differentiate tear hyperosmolarity from normal. Tear osmolarity could be considered as the best single test for detection of dry eye disease in daibetic patients.

Keywords:

Diabetes Mellitus, Dry Eye Disease, Diagnostic Accuracy Study, STARD

Biography:

Dr. Laily Najafi has been Graduated from Shiraz university of medical sciences as Medical Doctor, with the specialties including PhD by research in clinical diabetes in Iran university of medical sciences. Later on she obtained her post-graduation from Iran university of medical sciences with subjects "types of diabetes" and then started working at Endocrine Research Center, Institute of Endocrinology and Metabolism, where she has continued her research. Presently she has been working at the mentioned center in Tehran, Iran.

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Bottom Note:

This abstract has been taken from the International Webinar on Endocrinology & Diabetology held as an online webinar on July 27, 2020