Contact Lens Update
CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Canadian Dry Eye Summit: Questioning the questionnaires
December 11, 2019

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A fundamental first step in the diagnosis of dry eye disease is to quantify patient symptoms via use of a questionnaire. In fact, should a patient's responses score under values set in TFOS DEWS II, then further testing of homeostasis markers is not warranted for the purposes of dry eye diagnosis. There are two questionnaires recommended for use by TFOS DEWS II: the Ocular Surface Disease Index (OSDI) and the Dry Eye Questionnaire-5 (DEQ-5). It was notable that a third questionnaire was mentioned consistently throughout the Canadian Dry Eye Summit. Use of the Standard Patient Evaluation of Eye Dryness (SPEED) was routinely recommended from the podium, and appeared to be the most commonly used and preferred questionnaire by the eye care professionals in the audience. This article has been written in response to this verbalized preference. Read on to find out more about the OSDI, DEQ-5 and SPEED surveys and their use in the diagnosis and management of dry eye disease.

Questionnaire overview

Questionnaires are routinely used in clinical research to screen subjects and detect change in symptoms over time. However, general optometric practice typically relies on establishing ocular symptoms via open verbal questions during the patient history. For eye care professionals looking to focus on dry eye, accurate diagnosis of the disease is improved when a standardised questionnaire is used. The scores derived from patient responses allow the level of symptoms to be quantified, graded against known cut-off values for disease severity, and to be sensitive to change in the disease state over time.

To be practical for use in a practice setting, a questionnaire must be simple, quick and repeatable to use, easily understood by the patient, with an easy calculation required at the end to establish the final score. It is important that a questionnaire is validated for its ability to discriminate between 'normal' and 'abnormal' populations. However, TFOS DEWS II notes that generally validation is done between patients with and without Sjogren's Syndrome. This means questionnaires are typically validated for their ability to discriminate between groups of patients with severe aqueous deficient dry eye,[1] and this may not necessarily reflect how well they work for those with evaporative elements to their disease.

OSDI

The OSDI is said to be the most widely used questionnaire in clinical trials.[1] It contains questions relating to frequency of symptoms, environmental triggers and vision-related quality of life, asking the patient to complete their responses based on their experience over the preceding week. There are a total of twelve questions, with a calculation required to reach the final score, which can range from 0-100. Reliability and validity of the questionnaire has been established, showing its ability to discriminate between normal and dry eye, and further, to distinguish between mild (13-22), moderate (23-32) or severe (33-100) dry eye.[2,3] The amount of change in

OSDI score to reflect a clinically important difference has been reported as ranging between 4.5-7.3 for mild and moderate disease, and 7.3 to 13.4 for severe disease.[3] OSDI has been used as the comparator for the validation of a number of other questionnaires, with the Symptoms Analysis in Dry Eye (SANDE),[4] SPEED,[5,6] and DEQ-5,[7,8] all showing concurrent results to OSDI.

DEQ-5

The original Dry Eye Questionnaire (DEQ) is composed of 21 questions and assesses symptoms and 'bothersomeness'. It includes categories on prevalence, frequency, diurnal severity and intrusiveness of symptoms, and is mainly used as an instrument for clinical studies and epidemiological research.[9] As its name suggests, the DEQ-5 is a shortened, five-question version of the DEQ. The DEQ-5 is validated and is reported to be sensitive to disease severity.[10] Based on a typical day in the last month, the patient responds to questions about the frequency and severity of eye discomfort and eye dryness, along with a question about frequency of watery eyes. The possible scores range from 0-22. Patients without dry eye have been shown to score 2.7 ± 3.2 on the DEQ-5, with mean scores established for mild (8.6 ± 3.1), moderate (11.4 ± 3.3) and severe (14.9 ± 2.3) dry eye. For screening purposes, it has been suggested that dry eye should be considered for scores of greater than six, and scores higher than twelve may indicate severe dry eye and a need to test for Sjogren's syndrome.[10]

SPEED

The SPEED questionnaire is a four-question instrument that assesses the frequency and severity of dry eye symptoms. Although not part of the final score, patients are asked about their dry eye symptoms over varying periods of time: at the visit, the last five days and the last three months. Scores are assigned to the frequency and severity of four different types of symptoms: dryness/ grittiness/scratchiness, soreness/irritation, burning/ watering and eye fatigue. The final score ranges from 0-28. The SPEED questionnaire has been shown to have good validity and consistency in comparison to several questionnaires, including OSDI, DEQ and McMonnies.[6,9,11] Further work comparing SPEED and OSDI in a nonclinical population established both good agreement between the questionnaires, along with suggestions of how SPEED scores relate to established OSDI scores for different severities of dry eye. With SPEED, the average score for normal subjects was 2.2, for mild dry eye 5.0, moderate dry eye 6.6, and severe disease 9.9.[6]

It is of interest to note the population of subjects used in the original validation of SPEED. The asymptomatic and symptomatic groups were not as polarized as some other validation studies (for example where Sjogren's patients are recruited). The clinical measures which correlated best with the SPEED score were corneal staining, meibomian gland score and meibomian gland yielding liquid secretion score (MGYLS). The authors commented that this suggested meibomian gland dysfunction may have been prevalent among the symptomatic group.

Comparisons and considerations for use in clinical practice

OSDI is recognised as a useful tool for clinical research, and was included in the TFOS DEWS II report as one of the two recommended questionnaires for dry eye diagnosis for this reason.[1] It is possible to use in practice too, however the twelve questions can take time to complete, with anecdotal reports of patients occasionally needing help to clarify the meaning of some questions. The final score requires calculation, which again can add time to an already busy day. An app is available for ease of completion and score calculation, and particularly when used in this format, OSDI can still easily fit into dry eye practice. The clear cut-off values for mild, moderate and severe dry eye, along with the understanding of a clinically important difference in score are all extremely useful attributes of this instrument.

DEQ-5 is a short, simple questionnaire, with a recall of symptoms over the past month. The final score is a simple summation of the responses, and a related, validated contact lens dry eye questionnaire (CLDEQ-8) is also

available.[12] Given the evidence that exists for this short questionnaire, and the possibility of using it in practice for dry eye patients, in conjunction with the CLDEQ-8 for contact lens wearers, it is perhaps a little surprising that DEQ-5 is not more popular. It was recommended for inclusion in the TFOS DEWS II diagnostic criteria precisely because of its short length and discriminative ability.[1] It would appear to be a useful and practical inclusion to dry eye practice and is perhaps underused at the moment.

Although SPEED is not one of the two recommended questionnaires in the TFOS DEWS II diagnostic criteria, it appears to be gaining in popularity. It has a number of useful attributes for clinical practice: it is a short, easily understood questionnaire, with a simple summed score. It is of interest that it is the only one of the three instruments reviewed here which has evidence of its validity with a potentially meibomian gland affected, evaporative dry eye, cohort. Given that up to 86% of dry eye patients are thought to have signs of meibomian gland dysfunction,[13] it is possible the questionnaire may better reflect the symptoms of the majority of dry eye patients. It would be useful to conduct more research in this area, perhaps examining use of all three questionnaires in a predominantly evaporative dry eye population. A final point to make is with regard to the use of SPEED in contact lens wearers. Initial work suggests the questionnaire may also be of value in this population of patients.[14] This may mean that practice staff can become familiar with just one single questionnaire that can be applied to all patients to evaluate both dry eye and contact lens symptoms.

Conclusion

Overall, the fundamental point is that away from practices already specialising in dry eye, the use of symptom questionnaires is likely to be low. The addition of routine quantification of patient symptoms via questionnaires is the first fundamental step to enhancing dry eye diagnosis and management. In this context, practitioners are encouraged to adopt the use of any validated questionnaire they feel comfortable with, which they believe can be added into their routine practice. These actions are arguably more important than whether the questionnaire of choice is one of the two recommended instruments in TFOS DEWS II or the SPEED questionnaire. All three are validated and have good evidence for their effectiveness in discriminating between normal and dry eye populations.

If you do not already routinely use one of these instruments, then please make use of the links below to download, and familiarise yourself with each of the three options reviewed here.

Links to: OSDI, DEQ-5 and SPEED.

REFERENCES

1. Wolffsohn JS, Arita R, Chalmers R, et al. TFOS DEWS II Diagnostic Methodology report. *The ocular surface* 2017;15:539-74.

2. Schiffman RM, Christianson MD, Jacobsen G, et al. Reliability and validity of the Ocular Surface Disease Index. *Arch Ophthalmol* 2000;118:615-21.

3. Miller KL, Walt JG, Mink DR, et al. Minimal clinically important difference for the ocular surface disease index. *Arch Ophthalmol* 2010;128:94-101.

4. Amparo F, Schaumberg DA, Dana R. Comparison of Two Questionnaires for Dry Eye Symptom Assessment: The Ocular Surface Disease Index and the Symptom Assessment in Dry Eye. *Ophthalmology* 2015;122:1498-503.

5. Finis D, Pischel N, Konig C, et al. [Comparison of the OSDI and SPEED questionnaires for the evaluation of dry eye disease in clinical routine]. *Ophthalmologe* 2014;111:1050-6.

6. Asiedu K, Kyei S, Boampong F, et al. Symptomatic Dry Eye and Its Associated Factors: A Study of University Undergraduate Students in Ghana. *Eye & contact lens* 2017;43:262-6.

7. Galor A, Felix ER, Feuer W, et al. Dry eye symptoms align more closely to non-ocular conditions than to tear film parameters. *British Journal of Ophthalmology* 2015;99:1126-9.

8. Caffery B, Chalmers RL, Begley C. Performance of the Dry Eye Questionnaire 5 (DEQ-5) Compared to Ocular Surface Disease

Index (OSDI) in Sjogren's and non-Sjogren's Dry Eye Subjects. *Investigative ophthalmology & visual science* 2011;52:3850-.

9. Stapleton F, Alves M, Bunya VY, et al. TFOS DEWS II Epidemiology Report. *The ocular surface* 2017;15:334-65.

10. Chalmers RL, Begley CG, Caffery B. Validation of the 5-Item Dry Eye Questionnaire (DEQ-5): Discrimination across self-assessed severity and aqueous tear deficient dry eye diagnoses. *Contact lens & anterior eye* 2010;33:55-60.

11. Ngo W, Situ P, Keir N, et al. Psychometric properties and validation of the Standard Patient Evaluation of Eye Dryness questionnaire. *Cornea* 2013;32:1204-10.

12. Chalmers RL, Keay L, Hickson-Curran SB, et al. Cutoff score and responsiveness of the 8-item Contact Lens Dry Eye Questionnaire (CLDEQ-8) in a Large daily disposable contact lens registry. *Contact lens & anterior eye* 2016;39:342-52.

13. Lemp MA, Crews LA, Bron AJ, et al. Distribution of aqueous-deficient and evaporative dry eye in a clinic-based patient cohort: a retrospective study. *Cornea* 2012;31:472-8.

14. Pucker AD, Dougherty BE, Jones-Jordan LA, et al. Psychometric Analysis of the SPEED Questionnaire and CLDEQ-8. *Investigative ophthalmology & visual science* 2018;59:3307-13.