Tablet-based tests of everyday visual function in a diabetic macular edema (DME) clinic waiting area: A feasibility study | IOVS

ARVO Annual Meeting Abstract | June 2020

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Investigative Ophthalmology & Visual Science June 2020, Vol.61, 2664. doi:

Abstract

Purpose : To assess the feasibility of conducting tablet-based tests of everyday visual function in hospital clinic waiting areas. To test the hypothesis that increasing severity of diabetic macular edema (DME) is associated with performance on tablet-based surrogates of everyday tasks.

Methods : People categorized with varying severity of DME performed two freely available tablet-based tests of 'real-world' visual function (Figure 1) while waiting for appointments in a busy hospital outpatient clinic. In a visual search task, participants were instructed to find a target item within a matrix of photographs of everyday objects. Primary outcome measure was median search time. In a face discrimination task, participants were instructed to 'spot the odd one out' among four human faces. Primary outcome measure was the smallest difference between faces that participants were able to discriminate reliably.

Results :

Sixty-one people (median [interquartile range; IQR] age 63 [56, 72] years; 41% female) classified as having mild (n=28), moderate (n=24) or severe (n=9) DME completed both tasks. Performance was compared to 99% normative limits established in a population of young adults with healthy vision (Jones et al., 2019). Thirty-four participants (56%; 95% confidence interval [CI] 43% to 68%) exceeded normative limits for visual search, while eight (13%; 95% CI 65% to 24%) exceeded normative limits for face discrimination. Visual search duration was significantly longer for people with severe DME compared to those with both mild and moderate DME (Kruskal-Wallis, p = 0.01). Face discrimination performance was not significantly associated with DME severity.

Median time taken to complete all eligibility screening, both tablet-based tasks, and a short questionnaire, was 21.5 minutes (IQR 19.1, 24.9). 98% and 92% participants reported the search task and the face discrimination task to be enjoyable respectively. 54% and 98% reported finding the search task and face discrimination task difficult respectively.

Conclusions : Portable tablet-based tests are quick, acceptable to patients, and can be feasibly performed in a busy clinic waiting area with minimal supervision. The visual search task in particular has potential for providing clinicians with additional information about patient's functional deficits not indexed by conventional tests.

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Figure 1. Screenshots from tablet-based tests