Reviewer's report

Title: The ChromaTest, a Digital Color Contrast Sensitivity Analyzer, for Diabetic Maculopathy

Version: 1 Date: 19 November 2007

Reviewer: Keith A Goatman

Reviewer's report:

General

An interesting study let down by a vague methodology section and weak statistical analysis.

This is very much a pilot study, including only low numbers of patients with CSME, and reusing the same data for training and testing purposes.

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1. Abstract mentions 22 eyes with CSME, but the results seem to show 35 eyes with CSME.

2. Method

The methodology section is too vague regarding the method used to determine specificity and sensitivity ("pass/fail criterion"). I couldn't replicate the sensitivity and specificity quoted (for instance, a threshold of 18% on the TCCT gave a sensitivity of 74% (26/35) and specificity 54% (62/115)).

I think it's more usual to quote sensitivity then specificity. It's also usual to include confidence intervals on sensitivities and specificities, especially where numbers are small as here.

"In each BCVA group" is confusing, as I think the authors mean in all eyes rather than in each group separately.

It should be made clear in the methodology that the test and training sets are the same (not just mentioned in the discussion).

I also have concerns about the statistical analysis:

(a) Ranges and SDs are quoted for parameters which are clearly not normally distributed (e.g. VA).

(b) What is the "non-parametric t test" used here? As I understand it, the t test is a parametric test, so a non-parametric t test isn't a t test, it's some alternative
(such as Wilcoxon Rank Sum test). As the data is not normally distributed a t-test is, rightly, out of the question. Using a Wilcoxon Rank Sum test on this data I got quite different p-values than the authors, with both PCCT and TCCT appearing significantly different ($p < 0.01$) between CSME/non-CSME groups. Some more details of the test used (including software used) and justification for the test used is important.

Discussion

Several times "normal levels" are mentioned. What are these normal levels? Were they determined by this study or somewhere else?

--------------------------------------------------------------------------------------------------------

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)

--------------------------------------------------------------------------------------------------------

Discretionary Revisions (which the author can choose to ignore)

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests