Reviewer's report

Title: The importance of central corneal thickness measurements and decision making in general ophthalmology clinics: a masked observational study

Version: 1 Date: 27 June 2007

Reviewer: Michael J Doughty

Reviewer's report:

General

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

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

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Discretionary Revisions (which the author can choose to ignore)

The authors present their own experience of decision making for glaucoma patients for when corneal thickness is added to the diagnostics. The issue is an important one. However, the outcome measure is a single short table (Table 1) which, in my opinion, could be condensed to a very short 'letter to the editor' type communication since it really does not inform reader of how these decisions were really arrived at. This outcome measure simply informs the reader that for 37 % of a vaguely defined study group, “knowledge of CCT changed management decisions”. It is also unclear however whether this was an exercise or whether the suggestions (pp. 6) were actually implemented.

Similar exercises have been undertaken by other groups but, in my opinion, a major ‘problem’ in this area is that there is so very little useful information on what happens over the following 3 to 5 years IF a glaucoma patient’s medications were changed based on also considering CCT. It is surely only when we have adequate data in this respect that pachymetry will be “an essential item” of equipment (as the authors claim). So, overall, I consider the submitted presentation as having questionable utility for the little information provided because it does not provide the reader with a basis for making their own informed decisions. I suggest that, with the information that the authors have available to then, it would be much more useful if the authors provided more detail on how they used the CCT data and the rest of the essential information on their patients (see below under information needed). The scientific quality of the presentation and could be improved by being a little critical in their literature summary (see below under literature and practice perspectives).
MAJOR COMPULSORY REVISIONS

Information needed

1. There was no Figure 1 in the material received.

2. How many separate readings were taken with the Goldmann tonometer. If just one applanation event was used, this is acceptable but it should be stated. It should also be stated in the methods, that only one CCT reading was taken.

3. An example should be given for the corrected IOP, e.g. the IOP was ____ and the CCT was ____, the algorithm in the Pachmate gives a corrected IOP of ____.

4. What was the uncorrected and corrected IOP data for the whole cohort and the POAG / OHT and LTG groups.

5. It would be very useful if the authors provided analysis of whether their IOP data was in fact dependent on CCT (by doing a regression analysis of all data, then for the subgroups). If it does not show some association (r of at least 0.3), then the corrections undertaken are surely of a questionable nature (see next item).

6. It is stated that the IOP was adjusted by +/- 2 mm Hg (pp. 6). This really does not mean anything. The actual data should be provided in more detail and, far more importantly, what adjustments were made in each of the groups. For example, it might be expected that the LTG patients would be more likely to have higher corrected IOP’s, but what proportion of this group compared to others?

Literature and practice perspectives

a. The authors make their statement (pp. 3) that “The influence of central corneal thickness (CCT) on IOP by conventional tonometers has been well documented by Goldmann ...”. Respectfully, it should be pointed out that there is only the briefest of mentions of corneal thickness in Goldmann’s paper, let alone any specific mention of central corneal thickness or actual measures of CCT etc. Furthermore, I wonder what the author’s perspectives might be on what instrument Goldmann used to measure corneal thickness in 1957?

b. The authors state that the relationship between IOP and CCT is non-linear and variable”. I question the inclusion of the ‘non-linear’ statement. I accept that there are a very few opinions to this effect, but very strongly suggest that a more careful scrutiny of the relevant papers, will show that such non-linearity has been derived from questionable statistical analyses (one of which actually leads to negative IOP values for corrected values !). Based on numerous published papers, one can conclude that the IOP-CCT relationship is variable but the authors have done little to help this cause by not providing the reader with useful data and analyses on their own cohort.

c. The authors make another statement (pp. 3) “What is certain is [that] CCT can allow for a more accurate estimate of the true IOP... “ and that “...using IOP is routine examinations seem mandatory.”. In my opinion, it has yet to be established whether CCT can provide the outcome measure the authors claim here, yet (I believe quite correctly) later note that there is no agreement on what
to do with the CCT data. If there is any consensus, then it is not the correction factor of Ehlers that is being more frequently used but I accept that if this is what is available through the Pachete instrument, then the authors have a right to use it. However, logically, as pointed out in one of the references (no. 17) they cite, it is an overcorrection. I would add that it surely does not make sense to use such a high correction factor but especially since it was derived from eyes undergoing surgery; this should be discussed. Lastly, as to whether pachymetry is mandatory is an open question too. To the best of my knowledge, the European Glaucoma society has not (yet ?) made a recommendation on correcting IOP data for LTG or POAG, just for OHT patients. This too should be considered.

d. The authors conclude (pp. 8) that “Implementation of routine central corneal thickness measurements will significantly change patient management in the general ophthalmologist’s practice”. I respectfully suggest it could be toned down substantially, e.g. it could change patient management but then likely only if someone is assigned to do the CCT and that the ophthalmologist has the time to consider the CCT data alongside the fundus and fields and perhaps even the OCT data etc.

What next?: Reject because too small an advance to publish

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests