Re: Wang et al.: Reversal of glaucoma hemifield test results and visual field features in glaucoma (Ophthalmology. 2018;125:352-360)

TO THE EDITOR: We read with great interest the recent retrospective cohort study by Wang et al1 describing a visual field (VF) feature model to predict the reversal of glaucoma hemifield test to within normal limits after 2 consecutive outside normal limits results. Although the article was insightful and well-written, we seek clarification on some concerns.

The authors stated that the 16 VF archetypes were identified by an unsupervised machine learning method (archetypal analysis) based on >13 000 reliable VFs, based on a database of 13 321 24-2 VFs previously published in literature.2 However, the reliability criteria for the 24-s VFs were different between these 2 studies, because Elze et al2 included all 24-s VFs with fixation losses of <33% and false negatives of <20% (without mentioning false positives),2 whereas fixation losses of ≤33% and false positives and false negatives of ≤20% were the reliability inclusion criteria for 24-2 VFs of the present study. We wonder whether this difference could potentially lead to interpretation bias of the results of the present study, because the accuracy of the archetypal analysis in identifying VF archetypes has never been tested and verified on SITA 24-2 VFs with the present study’s more strict reliability criteria.

Second, the authors suggest that a model purely based on parameters and features from 2 previous reliable 24-2 VFs can predict the glaucoma diagnosis and can help clinicians in the decision-making process, although clinicians naturally rely on other clinical data to make glaucoma management decisions. However, because patients’ clinical data were available only from one of the centers’ dataset, only 40 eyes were diagnosed with glaucoma based on glaucomatous optic disc changes on fundus photographs, corresponding VF defects and OCT-retinal nerve fiber layer (RNFL) images; thus, the authors’ conclusions might be not adequately powered. It would be more useful and interesting to confirm in all eyes of this study (or at least in a higher proportion of eyes) with structural imaging whether the probable early glaucoma patients (lower mean deviation, no glaucoma hemifield test reversal on 3 consecutive reliable 24-2 VFs + VF archetypes suggesting early glaucoma) had corresponding abnormalities confirmed by OCT-RNFL.3 Also the authors state that, for the eyes from Massachusetts Eye and Ear dataset, an assessment of glaucoma status at the time of the third VF test was made based on the consensus of 2 glaucoma specialists by reviewing fundus photographs for glaucomatous optic disc changes and OCT images for characteristic nerve fiber layer thinning closest to the test date of the third VF. However, if this assessment was performed several years from when the third VF was selected, this remains the “closest” to the third VF date but may not be so relevant. We also wonder how long after was the reliable VF that postdated the third test (when structural data were equivocal) was performed in order to confirm or exclude the diagnosis of glaucoma.

Finally, the authors did not specify what was the interval between the various VFs, and we wonder whether an earlier glaucoma diagnosis based on the correspondence between optic discs appearances and VF defects suggesting glaucomatous damage, and confirmed by correspondent changes at the OCT-RNFL would be preferable to the model suggested by the authors (no glaucoma hemifield test reversal on 3 consecutive reliable 24-2 VFs + VF archetypes suggesting early glaucoma), which can be significantly influenced by the patients’ prior experience with VF testing and might be considered obsolete at the present OCT-RNFL era.

We commend the author’s frank acknowledgement in the discussion of the limitations of the present study but seek clarification of the points we have raised.

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References