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EDITORIAL

How should cataracts be measured?

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Population surveys indicate that most older people have some cataractous changes in their crystalline lenses.[1–6] Despite such observations, however, the majority of older people do not require cataract surgery. Advances in surgical technique have been associated with a tendency to operate earlier in the natural history of cataract where the number of potential surgical cases is greater but where the benefits of surgery are less well defined. Adjustments in practice combined with high patient expectations of successful outcomes have created unprecedented surgical demand, and in England and Wales rates of cataract surgery have increased by 75% in 5 years, from 153 000 in 1997–1998[7] 270 000 in 2002–2003.[8]

There remain many unknowns in cataract surgery and the correct balance between risk and potential benefit is unclear, particularly in early cataract. Perfect technical surgery may be associated with unpredictable adverse outcomes and a proportion of patients are dissatisfied,[9] a small but significant number of whom end up with worse vision following surgery than existed preoperatively. Quantification of the risk of an adverse outcome is relatively straightforward using standard auditing tools, but prediction of exactly which patients will benefit from surgery is more difficult. A clearer understanding of who will benefit needs to be underpinned by knowledge of how cataract affects the visual life of the individual.[10]

The time-honoured clinical triad of history-taking, visual acuity measurement and slit-lamp examination remains the mainstay of decision-making when offering surgery. Although assessment of vision-related quality of life may help,[10,11] a critical look also needs to be taken at the roles of lens examination and of vision-testing. Formal scoring systems for cataract quantification abound, many being clinician based, with or without imaging.[12–14] No single set of criteria for deciding eligibility for cataract surgery would suffice as the dynamic between interference with vision and justification of surgical risk will vary from one patient to another. Furthermore, the perceptions of risk will vary between patients and their decision-making will vary accordingly.

In this issue Chua *et al*[15] have confirmed the widely held belief that cataract in the central area of the lens has a greater impact on vision. The information presented is a helpful addition to the decision-making process. However, in addition to location, the clinicopathological class of cataract is also important. In clinical decision-making situations, other subtypes of cataract besides those measured in their study are frequently observed and these too need to be taken into account.[16,17]

When considering the importance of vision tests in the assessment of cataract, it is relevant to distinguish the research situation, where contrast sensitivity and glare testing may be used to investigate the effects of cataract on vision in detail, from the clinical situation where a decision has to be made about surgery. There is a common nonsequitur in the vision science literature, which reads as follows: The new vision test 'B' correlates poorly with existing vision test 'A', therefore test B is useful. In a classic study of subjects with monocular nuclear and cortical cataracts, Hess and Woo[18] measured contrast thresholds for a range of different spatial frequencies. Two distinct types of abnormality were found. Either the abnormality was restricted to high frequencies or it involved all spatial frequencies. The interpretation is that early cataract tends to affect contrast sensitivity (CS) at the higher spatial frequencies. Thus, it can be argued that visual acuity (if performed carefully) is the most appropriate test for early cataract. CS may be impaired at lower spatial frequencies in more advanced cataracts. However, it may be argued that in advanced cataract, the patient is more symptomatic and the need for surgery is more

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apparent; therefore, there is little if any need for CS testing in either early or advanced cataracts in the clinical setting. This highlights the difference between the use of CS as a research tool (where it has undoubted value) and as a clinical tool.

Chua *et al*[15] suggest that in a clinical situation, glare disability testing may not add significantly to the clinical picture. This observation is supported by the findings from other studies.[19] Glare is not specific to cataract, nor do glare symptoms correlate predictably with glare tests. Glare disturbance occurs in other ocular conditions and is also present in the normal visual experience, for example difficulty in seeing an object in a dark tunnel entrance on a bright day, or seeing haloes around lights at night. As the authors also point out, glare disability scores are obtained by calculating the difference between two measurements which increases measurement noise and makes glare sensitivity a less reliable test.

The treatment of early cataract is now a major resource problem for developed nations with ageing populations. Exploring the subtleties of cataract assessment may help to define appropriate levels of service provision and avoid crude, expediency driven demand management devices. The data presented by Chua *et al*[15] offer a further step towards such a goal.

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