Dissecting the acquired component from congenital loss of chromatic sensitivity in the clinical setting

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Congenital colour anomaly (Daltonism) affects ~ 8% of men. The most common type is red-green deficiency. Optic nerve or retinal disease can cause either transient or permanent loss of chromatic sensitivity. Daltonism is difficult to assess clinically when acquired deficiency is also present. Pseudo-isochromatic tests (e.g., the Ishihara plates) are the most common clinical tools for assessing colour vision deficiencies. In the case of the Ishihara the first plate and the following 16 pseudo-isochromatic plates are routinely used, while the anomalous colour plates are rarely used. In this study we examine the use of the anomalous test plates in patients with Daltonism when acquired loss of chromatic sensitivity is also involved. Ten patients with Daltonism developed asymmetric optic nerve or retinal disease (optic neuritis, non-arteritic ischaemic optic neuropathy, maculopathy with cone dysfunction). In each patient, there was asymmetry in the ability to read the anomalous colour plates: 2-4/4 in the unaffected or less affected eye; 0-2/4 in the more affected eye. Although relatively crude and qualitative, the anomalous test plates can be used efficiently in a clinical setting to screen for acquired and often asymmetric disease over and above congenital colour anomaly. A number of patients have been examined further using the Colour Assessment and Diagnosis (CAD) test (*Proc.R.Soc.Lond.B.* 258 (1353):327-334). The results show that the selection of appropriate parameters for the CAD test reveal the presence of acquired loss of chromatic sensitivity in patients with Daltonism. The technique exploits the differences in the pattern of loss observed in congenital and acquired deficiencies and the dependence of chromatic sensitivity loss on stimulus size and location in the visual field.