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Chromatic sensitivity changes in Type I and Type II diabetics

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Purpose: Previous studies have shown that patients with type I diabetes can exhibit significant loss of colour vision that often precedes any clinical signs of retinopathy. In this study we investigated loss of red-green (RG) and yellow-blue (YB) chromatic sensitivity in both type I and type II diabetic patients. The aim was to establish how the type, onset, retinal thickness and the glycated haemoglobin (HbA1c) level affect the severity of RG and YB loss.

Methods: 110 patients diagnosed with diabetes (90 type II and 20 type I) took part in this study. BCVA, duration of diabetes, HbA1c and central subfield thickness (CST) were recorded in each patient. RG and YB colour thresholds were measured monocularly using the CAD (Colour Assessment & Diagnosis) test (*Expert Rev. Ophthalmol.* 6:409-420, 2011).

Results: Both type I and II diabetic patients showed significant loss of both RG and YB chromatic sensitivity with thresholds that ranged from just above the upper, age-corrected threshold limits for normal colour vision to complete absence of chromatic sensitivity. There was little or no correlation with type, duration of diabetes, loss of visual acuity, retinal thickness changes or the HbA1C index. The diabetics examined separated into two groups, the majority have RG (72%) and YB (65%) thresholds below ~ 6 standard normal CAD units with little or no difference between type I and II. A subgroup of patients (mostly type II) exhibit much larger thresholds, but no correlation with age or duration of diabetes.

Conclusions: RG and YB colour thresholds provide a sensitive measure of functional change in diabetics. Both type I and II diabetic patients exhibit loss of both RG and YB chromatic sensitivity, with little or no difference between the two types. Neural changes in diabetes that cause loss of colour vision do not appear to be linked directly to type, duration or the HbA1c level.

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