

## CONTRAST SENSITIVITY CHANGES IN AMBLYOPIA PATIENTS

Shiow-Wen Liou, and Chun-Chen Chen

**PURPOSE:** To investigate the interrelationship of contrast sensitivity among amblyopic eyes, dominant eyes and normal eyes, and to evaluate the outcome of amblyopic treatment.

**METHODS:** Contrast sensitivity and visual acuity were examined in 69 eyes of strabismic and/or refractive amblyopic patients (mean age: 8 yrs.) every two months to evaluate the outcome of amblyopia treatment and interrelationship between amblyopic and dominant eyes in unilateral amblyopia. An additional 100 eyes of children with corrected vision  $\geq 1.0$  were selected for control groups.

**RESULTS:** Reduced contrast sensitivity in amblyopic eyes was most evident at high spatial frequencies (SF). Decreased contrast sensitivity at low SF was also found in refractive amblyopic eyes. Contrast sensitivity function (CSF) improved significantly after treatment with occlusion and/or CAM. However, when visual acuity reached 20/20 in amblyopic eyes, there was still significant difference in CSF between normal and amblyopic eyes.

**CONCLUSION:** Different types of amblyopia had different CSF patterns, which changed with treatment. The relationship between visual acuity and contrast sensitivity was not parallel during treatment. Beside visual acuity, CSF was also an important parameter in the treatment of amblyopia.

Key words: Contrast Sensitivity, Spatial Frequency, Amblyopia

### INTRODUCTION

Amblyopia is defined as an optically uncorrectable loss of vision, usually monocular, without demonstrable pathology in the posterior pole of the eye. This condition develops in early childhood and it affects 2% – 4% of the population.

For the follow-up and treatment of amblyopic

patients, regular examination of visual function is very important. Traditionally the visual function is tested by Landolt or Snellen chart, in an environment under 100% contrast, which is not compatible with real world situations. Campbell and Green (1) initially applied the examination of contrast sensitivity in clinical use in 1965, and their approach was based on the theory of Fourier analysis. With the application of Fourier analysis, images accepted by the retina can

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Department of Ophthalmology, Taipei Municipal Jen-Ai Hospital, Taipei Medical University, Taipei, Taiwan, R.O.C.  
Correspondence and reprint requests to: Shiow-Wen Liou, Department of Ophthalmology, Taipei Municipal Jen-Ai Hospital, 10, Sec. 4, Jen-Ai Rd., Taipei, Taiwan.