

Contrast sensitivity evaluation in a population-based study in Shahroud, Iran

PURPOSE:

To determine the normal range of contrast sensitivity and its determinants through a population-based study in Shahroud, in northern Iran.

DESIGN:

Population-based cross-sectional study.

PARTICIPANTS:

Using random cluster sampling in Shahroud ۶۳۱۱ people between ۴۰ and ۶۴ years of age were sampled; ۵۱۹۰ (۸۲.۲۴%) responded, and ۹۶۵ participants were selected randomly for contrast sensitivity testing.

METHODS:

Participants underwent thorough eye examinations, including visual acuity and refraction tests, funduscopy, and slit-lamp examination.

MAIN OUTCOME MEASURES:

Contrast sensitivity was tested with best correction using the CVS ۱۰۰۰ grating charts (VectorVision, Inc., Greenville, OH), and results are reported here in log units.

RESULTS:

Overall, mean \pm standard deviation contrast sensitivity in spatial frequencies of ۳, ۶, ۱۲, and ۱۸ cycles per degree was ۱.۶۲ ± ۰.۱۹ , ۱.۸۷ ± ۰.۲۲ , ۱.۵۳ ± ۰.۲۸ , and ۱.۰۹ ± ۰.۳۰ log units, respectively. Contrast sensitivity worsened significantly with age and with lower levels of uncorrected visual acuity ($P < ۰.۰۰۱$). Compared with men, contrast sensitivity was worse among women in spatial frequencies of ۳ and ۶. Contrast sensitivity was significantly worse with myopia of more than ۵.۰ diopters ($P < ۰.۰۰۱$). There was an inverse correlation between the amount of astigmatism and contrast sensitivity in all spatial frequencies ($P < ۰.۰۰۱$). Contrast sensitivity showed a significant variability among people with normal vision that increased at higher spatial frequencies.

CONCLUSIONS:

The present findings can be used as a reference guide for contrast sensitivity in a general population and for comparison in future studies. Contrast sensitivity declines with age, high myopia, and astigmatism. The wide range variability, even in the presence of normal visual acuity, should be considered when contrast sensitivity is tested.