LETTER TO THE EDITOR

Correct method for statistical analysis of stereopsis in ophthalmology research

Alireza Peyman · Mohammadreza Peyman · Mohammadreza Akhlaghi

Dear Editor

The article entitled "Stereopsis in bilaterally multifocal pseudophakic patients" by Ferrer-Blasco and co-authors [1] was interesting. The results demonstrate binocular vision quality after implantation of the new generation of intraocular lenses. In the results section, the Titmus and random-dot stereo-tests, and Howard–Dolman results are expressed as "*mean ± standard deviation*" of sec arc. However it is somewhat problematic to express stereoacuity results by mean ± standard deviation. The amount of stereoacuity is commonly expressed in seconds of arc with numbers such as 15, 30, 60, 120, 240, 480, and 960 seconds of arc. The numbers resemble a geometrical sequence where each term after the first is found by *multiplying* the previous one by a fixed common ratio. The geometrical progression is also seen in visual acuity, expressed as Snellen notation.

Statistical analysis of values with geometrical properties needs special consideration; it is not possible to simply add or subtract values, or calculate a "*mean*" using the sum divided by the count. A practical solution is to analyze the *logarithm* of the values. As a mathematical rule, the log of a product is the sum of the logs; this property converts geometrical series to arithmetic progression. A similar method is used to analyze Snellen acuity results by converting values to LogMAR.

The authors did the basic steps for accurate analysis; the data was statistically checked for normality, and a normal distribution was found. The apparently normal distribution curve, however, may happen due to limited sample size and narrow range of results, but the data by nature would not follow a normal distribution at large scales and full range. It seems more sensible to compute the logarithm of stereopsis second of arc for statistical analysis to obtain more accurate results, or at least this method should be tried to see if it produces a better distribution.

Reference

1. Ferrer-Blasco T, Madrid-Costa D, García-Lázaro S, Cerviño A, Montés-Micó R (2011) Stereopsis in bilaterally multifocal pseudophakic patients. Graefes Arch Clin Exp Ophthalmol 249:245–251

A. Peyman (✉) · M. Akhlaghi
Isfahan University of Medical Sciences,
P.O. Box 81645–641, Isfahan, Iran
e-mail: drpeyman@hotmail.com

M. Peyman
Department of Ophthalmology, Faculty of Medicine,
University of Malaya,
Kuala Lumpur, Malaysia