Mean – and the Reporting of Continuous Data

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I read with interest the article by R.A. Droesner et al. [1] which addressed aspects on octreotide prophylaxis related to pancreatic surgery. In tables 1 and 2, the authors present continuous data (i.e. age, operation time, blood loss), and they express these data as mean and standard error of the mean ($\pm$ SEM). Unfortunately, this misconception about the use of SEM is encountered rather frequently, even in top-ranked journals.

The mean and the standard deviation ($\pm$ SD) should be given to present data with a normal distribution. For skewed continuous data, which is the case in many clinical settings, the median value with an interpercentile range should be preferred [2, 3]. The SD refers to the variation in the values of the variable within the sample. The sample mean may vary every time we take a new sample from a study population. Of note, SEM is not a descriptive sta-

tistic, and accordingly it is not a measure of dispersion for distribution of measurements [3]. SEM may give us an idea of the accuracy of the mean. SEM is always smaller than the SD ($\text{SEM} = \text{SD}/\text{square root of the sample size}$), and authors may be tempted to present SEM instead of a wider SD to indicate that their observation are more accurate.

In table 1, the authors have also presented the ASA score (which is a score categorized between 1 and 4) as mean $\pm$ SEM for two different groups, and obviously compared the two groups by use of the t test. In general, this is considered inappropriate from a statistical point of view. A comparison of frequencies of two groups (i.e. the distribution of scores 1–4) should preferably be done by the χ^2 test.

It remains a challenge for all of us to scrutinize our manuscripts for any vague or wrong unintended methodological

blunder or inappropriate statement. To improve, we need, also as surgeons, to write and present more, and to take into consideration comments and suggestions made by reviewers and editors – and welcome any feedback from our fellow surgeons. This is how surgical science evolves.

References

- 1 Droesner RA, Jeanmonod P, Schuld J, et al: Octreotide prophylaxis is not beneficial for biochemical activity and clinical severity of post-operative pancreatic fistula after pancreatic surgery. *Dig Surg* 2012;29:484–491.
- 2 Lang TA, Secic M: *How to Report Statistics in Medicine*. Philadelphia, American College of Physicians, 2006.
- 3 Lang TA: *How to Write, Publish and Present in the Health Sciences. A Guide for Clinicians and Laboratory Researchers*. Philadelphia, American College of Physicians, 2010.