Reference

The author has indicated no financial support.

Conflict of interest

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: http://dx.doi.org/10.1016/j.sleep.2014.05.031.

References


Tomoyuki Kawada *
Department of Hygiene and Public Health, Nippon Medical School, Tokyo 113-8602, Japan

* Address: Department of Hygiene and Public Health, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-Ku, Tokyo 113-8602, Japan.
Tel.: +81-3-3822-2131; fax: +81-3-3688-3065.
E-mail address: kawada@nms.ac.jp

Response to Kawada

To the Editor:

In response to Kawada’s critique, we would like to clarify that we did use a multivariate signal detection approach. Rather than a single variable receiver operating characteristic (ROC) curve we simultaneously entered multiple variables as predictors. We would like to discuss the merit of this multivariate ROC. In clinical settings, it is often necessary to examine dichotomous outcomes to make explicit decisions and identify subgroups of individuals who are at high risk [1]. Logistic regression analysis and signal detection are two multivariate statistical methods that identify subgroups at risk and include an outcome variable. In our original study, we used the latter method. The signal detection analysis we performed utilizes the ROC procedure and creates a quality receiver operating characteristic (QROC) tree identifying the best predictors along with optimal cutoffs. This signal detection procedure identifies subgroups at risk using recursive partitioning based on an empirically driven iterative nonparametric process. This method has been used to identify Alzheimer patients who are at risk for rapid cognitive decline, find predictors of change for a heart disease intervention, or identify predictors of remission in chronic depressed patients in different modalities of treatment [2–4].

In a logistic regression “all in” procedure as suggested by the critique as an alternative, all variables are given weights; but the weights might be very close to zero for some. In the signal detection method, only a small number of variables (identified as the best predictors) are given weights. A variable that unreliable measures or that lacks predictive value to the outcome (thus probably a zero weight in the logistic regression model) would not be picked up not the signal detection algorithm. Important to the above critique, in an “all in” logistic regression procedure, collinearity among the predictors can introduce both bias and loss of power. In contrast, once a variable is selected in the signal detection procedure, other variables that are highly correlated with it are unlikely to be subsequently chosen, thus avoiding collinearity.

From an ethical and medical policy points of view, the stepwise procedures are to be recommended in measure development. If one can achieve equal predictive value using only one scale as with four, there are considerable savings of time and effort in focusing only on the one scale. If there are costs involved in the use of the scales, the use of one scale would also reduce costs. The issue is not to “establish superiority” of one scale, but to provide the best prediction for each patient at the least cost. Clearly one should consider all options (multivariate) when making a decision, but the notion that one must use all options (simultaneous) is detrimental to patient care, and not even statistically sound [5].

Conflict of interest

All authors have no conflict of interest.

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: http://dx.doi.org/10.1016/j.sleep.2014.05.032.

References


Rachel Manber 1
Department of Psychiatry, Stanford University, Palo Alto, CA, USA

Chol Shin *,1
Korea University Ansan Hospital, Institute for Human Genomic Study, Ansan, Republic of Korea
Division of Pulmonary, Sleep and Critical Care Medicine, Department of Internal Medicine, Korea University Ansan Hospital, Ansan, Republic of Korea

* Address: Division of Respiratory and Critical Care, Department of Internal Medicine, Ansan Hospital, Korea University, 516, Gojan-1-dong, Danwon-gu, Ansan-si, Gyeonggi-do, 425-707, Korea. Tel.: +82 31 412 5603; fax: +82 31 412 5604. E-mail address: chol-shin@korea.ac.kr

1 These authors contributed equally to this manuscript.

http://dx.doi.org/10.1016/j.sleep.2014.05.032
1389-9457/© 2014 Elsevier B.V. All rights reserved.