

## Problems in Conducting Multivariate Logistic Regression Analysis

### Çok Değişkenli Lojistik Regresyon Analizinin Yürütülmesinde Karşılaşılan Sorunlar

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To the Editor,

We read with great interest the original article "The Relationship Between Procalcitonin Level and Short-Term Mortality in Emergency Department" by Cehreli et al. (1). A high initial level of procalcitonin (PCT) is a sensitive marker of bacterial infection, and the degree of PCT elevation can determine which patients are at greater risk of adverse outcomes. In this study, the authors wanted to analyze whether there was an association between PCT levels and seven-day mortality in patients whose PCT levels were measured in the emergency department. However, we think that there are some serious methodological mistakes.

In the case of regression models, it should be stated whether the variables included in the multivariate model in logistic regression analysis were taken from previous studies or from the results of univariate analysis. To the best of our knowledge, variables with  $p < 0.1$  or  $p < 0.2$  in univariate analyses can be included in the multivariate logistic regression model (2,3). The authors (1) stated in the statistical analysis section that the variables with  $p\text{-value} > 0.2$  as a result of univariate analyses were included in the multivariate logistic regression analysis. When we evaluate the multivariate logistic regression model, it is understood that the  $p$  values of other variables except hemoglobin are less than 0.2 in univariate analyses. We think that the authors have stated  $p > 0.2$  instead of  $p < 0.2$  due to a writing mistake.

In this situation, it is unclear how the authors included hemoglobin in the multivariate logistic regression model. These problems are not only limitations of the article, but also the main problems directly affecting the study results. The article performed statistical analysis without the basic requirements of logistic regression analysis. Therefore, in our opinion, the conclusion of Cehreli et al. (1) should be carefully evaluated.

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