



## Methodological issues on prediction of postoperative desaturation after spinal anesthesia in aging patients

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### Letter to the Editor

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We carefully and enthusiastically reviewed the article by Jo et al. published in the August 2019 issue of the *Korean Journal of Anesthesiology* [1]. The purpose of their study was to survey postoperative desaturation prediction after spinal anesthesia in aging patients based on preoperative pulmonary function and arterial blood gas analysis. Therefore, the authors examined the medical records of three hundred thirty-nine of patients (age  $\geq 80$  years) who had a recorded history of undergoing femoral neck fracture surgery under spinal anesthesia [1]. Binary logistic regression analysis and receiver operating characteristic curves were used to investigate the predictors and predictive ability of early postoperative desaturation [1]. The authors reported that the PaO<sub>2</sub>/FiO<sub>2</sub> ratio (OR = 0.972) and history of cardiovascular disease (OR = 2.127) predicted postoperative desaturation after femoral neck surgery using spinal anesthesia [1].

To develop and evaluate the prediction of a disease outcome or score and index, there are requirements to which studies must adhere. The first requirement is that the study design includes a cohort, which can be transformed into two separate cohorts or two cohorts of patients with failed or successful outcomes [2,3]. The second requirement is model validation, including internal and external validation, which uses the same data for internal validation but separate data for external validation. Various methods such as split file and bootstrapping, among others, can be used for validation. [2-5]. Thirdly, discrimination is defined as the ability to distinguish events from non-events, which is appropriately determined by area under the curve (AUC). One should always consider that a large AUC only reflects a high degree of discrimination, and it may become difficult to assess whether it is appropriate or not. Consequently, even if the AUC is statistically significant, there is a chance it won't be predictive [3]. If the qualitative interaction between the important variables is not examined, it will lead to miscalculations of results [3].

The authors concluded that preoperative PaO<sub>2</sub>/FiO<sub>2</sub> ratio might predict the postoperative desaturation in aging patients after spinal anesthesia for femoral fracture surgery, while preoperative arterial blood gas analysis may be helpful in predicting early postoperative desaturation in such patients [1]. In summary, for predictive studies, the above points should be duly considered, otherwise, prediction cannot be guaranteed despite a significant association [2,3]. In this letter, we explain the drawbacks of the article presented by Jo et al. and recommend that any predictive study should adhere to the above methodological requirements [2-5].

### Conflicts of Interest

No potential conflict of interest relevant to this article was reported.

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