Linear Logistic Regression Predicts Generalized Sedation As Well As Response Surface Models For Midazolam And Alfentanil Sedation In Gastrointestinal Endoscopy

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Background and Objectives: Researchers have used the linear logistic regression (LR) and the non-linear response surface models (RSMs) to predict patient responses. The reduced Greco and hierarchy RSMs have proven to be accurate in gastrointestinal endoscopies using midazolam and alfentanil. In this study, we evaluate how a simpler model such as LR will perform as compared to the RSMs.

Methods: Patients who received esophagogastroduodenoscopy (EGD) and colonoscopy sedation with midazolam and alfentanil were candidates for the study. LR was performed for the EGD group and validated using the colonoscopy group. The two RSMs went through the same process. Their performance and ROC curves were evaluated.

Results: Thirty-three patients were included and the native EGD LR model had an ROC curve area of 0.94. For external validation, ROC curve was 0.92, 0.94 and 0.94 for the reduced Greco RSM, hierarchy RSM and LR model respectively. Pairwise comparison was not significant.

Conclusion: The LR model performed as well as RSMs in generalizing the predicted sedative effect of midazolam and alfentanil during gastrointestinal endoscopies. Linear LR may be used for generalization across patients experiencing procedures that shared similar stimulus intensity.