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Letters to the Editor

Reply to the letter to the editor regarding: development and validation of a point-of-care clinical risk score to predict surgical site infection following open spinal fusion by Mueller et al


We thank the authors for their interest in our publication regarding the surgical site infection (SSI) prediction model for spine surgery patients. We agree that HbA1C is an important risk factor for SSI. As a continuous scale of hyperglycemia, it could potentially provide more predictive power for SSI risk. It could also assist in stratifying the SSI risk to a more granular level which would help surgeons to narrow down the identification of high-risk patients.

We also believe that hyperglycemia and diabetes are contributing to the SSI risk in both collaborative and independent manners. According to a meta-analysis of 94 US hospital studies published since 1985, the association between diabetes and SSI after controlling for glucose level and the association between glucose level and SSI after controlling for diabetes were both statistically significant [1], indicating that both factors contributed independently to SSI.

Although HbA1C is a strong predictor of diabetes complications and has been used to diagnose type 1 and type 2 diabetes, an HbA1C test may indicate diabetes even though a blood glucose test does not and vice versa, as factors, such as medications, anemia, kidney disease, and high triglycerides, can affect HbA1C testing and cause false results. Likewise, a diabetic patient could have a relatively low HbA1C level with good diabetes control. It is possible that diabetes and blood glucose level affect SSI as individual risk factors as well as an interaction.

We did not include HbA1C or other measures for blood glucose in our model because lab data was missing in the database for most of the selected patients. For our analysis, diabetes was more easily identified by patient diagnosis codes. This ensured we had a large enough sample size for a strong prediction model. Otherwise, we would have examined the diabetes and HbA1C relationship in predicting SSI through three approaches: (1) test if HbA1C mediates the association between diabetes and SSI, (2) test if HbA1C and diabetes both contribute significantly to SSI in one model after ruling out multicollinearity, and (3) test how HbA1C predicts SSI in diabetic and nondiabetic populations, respectively, to investigate the possible modification of diabetes on the HbA1C-SSI association. We strongly encourage future research to add

evidence to this topic, which would not only help answer the question but also inspire better practice.

We have long been dedicated to developing techniques and knowledge to improve surgical outcomes, particularly for high-risk spine surgery patients. The application of the SSI assessment tool fed by easily attainable clinical information [2], combined with optimized incisional management [3] including postoperative negative pressure therapy [4], could be an important advancement of spine surgery as a value proposition, particularly with respect to cost-effectiveness and prevention of adverse outcomes.

Declarations of Competing Interests

One or more of the authors declare financial or professional relationships on ICMJE-NASSJ disclosure forms.

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