**Validation of the Melbourne Clinical Prediction Tool for Persistent Adverse Glycaemia in the STOIC-D Surgery cohort**

Objectives

Hyper- and hypoglycaemia are common in hospitalised patients and associated with adverse outcomes, yet inpatient glycaemic management remains largely reactive. The Melbourne Clinical Prediction Tool (1) was developed to identify patients at high risk of persistent adverse glycaemia (AG) within 24 hours of admission, but has not been validated in pure surgical cohorts, a group with distinct perioperative risks. We performed external validation of the tool in the STOIC-D Surgery cohort (2).

Methods

We included 985 surgical inpatients with type 2 diabetes from the STOIC-D Surgery trial, applying the same inclusion criteria as Kyi (1). The tool was retrospectively applied using the original four admission variables: preadmission glucose-lowering therapy (sulfonylurea or insulin), admission dysglycaemia (<4 or >15mmol/L), A1c, and glucocorticoid use (≥7.5mg prednisolone-equivalent within 24 hours and continued for ≥24 hours). Patients were stratified into low or high risk of persistent AG (≥2 days with glucose <4 or >15mmol/L), and tool performance was compared with the original mixed medical-surgical cohort.

Results

Of 985 patients, 504 (51%) were classified as high risk, and 481 (49%) as low risk. AG incidence was 46% in the high-risk group versus 20% in the low-risk group. The tool yielded a sensitivity of 71%, specificity of 58%, and estimated ROC-AUC ~0.65, indicating moderate discriminative ability but lower performance compared to the original cohort (ROC-AUC 0.806). Notably, 96 patients with admission dysglycaemia but without elevated A1c, glucocorticoids, insulin or sulfonylurea treatment were misclassified as low risk.

Conclusion

While performance was modest in surgical inpatients, as anticipated, the tool retained meaningful predictive utility for early risk stratification. This reinforces its clinical relevance and highlights the importance of context-specific refinement of predictive tools. Ongoing agnostic analysis aims to produce a tailored predictive model for surgical cohorts. These findings support integration of predictive tools into real-time decision support to improve inpatient diabetes care.