Quantifying the rate of blood glucose changes over the acute stage of ischemic stroke among patients with diabetes.

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Background

Hyperglycemia (HG) during acute ischemic stroke (AIS) is associated with poor outcomes. Diabetes mellitus (DM) is an independent predictor for HG during acute ischemic stroke. The blood glucose progression and factors affecting its rate among patients with DM is not fully established. This study aimed to quantify the rate of blood glucose changes over the first 72 hours during acute ischemic stroke among patients with DM using a parametric approach.

Methods and results

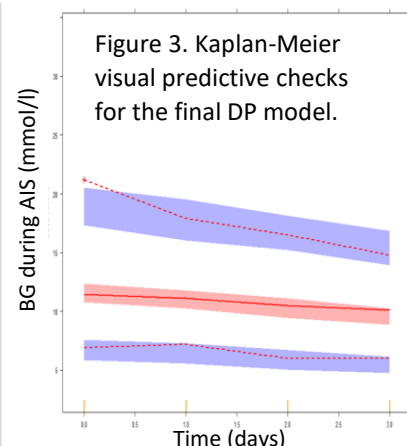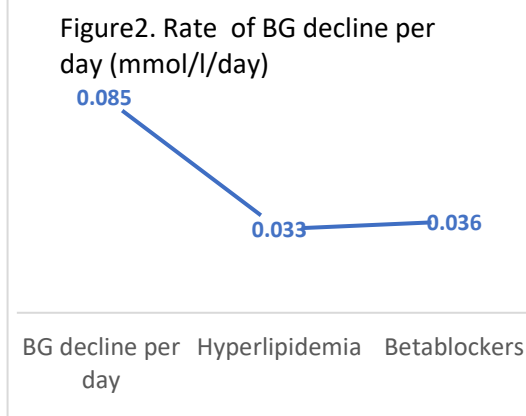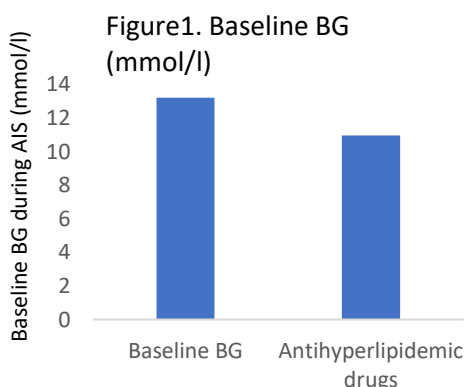Patients with HG during AIS (n=243)

Patients with DM (n=182) 75%
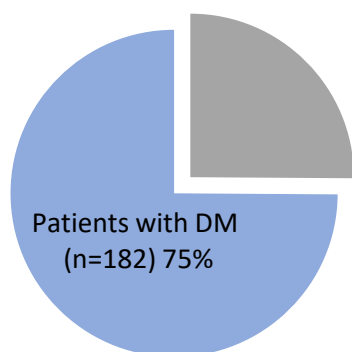
→ *Development of the base DP model*
Linear, nonlinear, and stepwise linear and nonlinear models were investigated

→ *Development of the covariate DP model*
Covariates were tested on baseline BG% predicted and slope during first 72hrs after admission with ischemic stroke.

Table1. Parameters of final developed DP model

	Linear final model (95%CI) DP=BASE*(1+SLOPE* (TIME))	RSE% from SIR
BG level at baseline (mmol/l)	13.2(6.39-20.0)	3.8
Rate of blood glucose decline over time (α) (mmol/l/day)	-0.0855(0.071-0.099)	11.65
θ Antihyperlipidemic on baseline	-2.25 (2.07-2.42)	25.55
θ Hyperlipidaemia on slope	0.0524 (0.049-0.055)	32.23
θ Betablockers on slope	0.0494 (0.046-0.051)	37.86
BSV	25.8(23.66-27.74)	12.8
Proportional residual error	28.46(24.08-32.09)	6.65

Figure1. Baseline BG (mmol/l)

Figure2. Rate of BG decline per day (mmol/l/day)

Figure 3. Kaplan-Meier visual predictive checks for the final DP model.

Conclusions

The baseline BG is decreased among DM patients who receiving antihyperlipidemic drugs prior stroke while, the presence of hyperlipidemia and receiving betablockers prior ischemic stroke increase the rate of BG progression among DM patients who have HG during AIS. marwaelsaeed@usm.student.my